Free Schools in America, 1850-1870: Who Voted for Them, Who Got Them, and Who Paid*

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ABSTRACT

Mass public schooling is indispensible to modern economic growth. This paper explores the emergence and consequences of free schooling in the USA in the nineteenth century, focusing on voters' self interests rather than ideology or the role of great men, as emphasized in popular views. Though literature on the political economy of policy decisions does not offer clear consensus on inequality and educational spending, a political economy model suggests that increases in both average property values and inequality in property holding are key to the emergence of free public education financed by local property taxes in the mid-19th century U.S. Empirical tests using data from various nineteenth century records support this view. The consequences of universal free public schooling were immediate. Children's education became less dependent on parents' wealth, and geographical inequality in enrollment rates declined.

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Modern economic growth has always been accompanied by the universal provision of free public schooling.[1] However, it was not until the mid-nineteenth century that taxpayers in the leading countries began to pay for educating the children of their poor neighbors.[2] Even in the United States, one of the earliest global leaders in developing mass public schooling, a majority of public schools charged fees to the parents of pupils until voters decided to raise more tax revenue at the local and state levels. During the period between 1850 and 1870, most American states achieved the free school system supported by property taxes rather than tuition.

This momentous transition from no or partial to full public funding for schools has been surprisingly underemphasized by economists. Though the common school crusade to make schools free and build a state school system is one of the most famous episodes in the history of American public education, it has been puzzling why the great school men such as Horace Mann and Henry Barnard who led the crusade were more successful than were earlier pioneers such as Thomas Jefferson or Adam Smith who did not overlook the importance of educating the general public. Another puzzle was the wide variation over time or across places in accomplishing free schools. Early American public schools date back to the colonial period, but not everywhere in the United States had schools before the Civil War. For example, Massachusetts and New Hampshire were much earlier than New York and Connecticut in raising more taxes and abolishing charges to parents.

To explain this uneven achievement of universal free public schooling in the United States, this paper focuses on voters self interests rather than ideology or the influence of great men that have been emphasized in the existing literature. This does not mean that the influence of the crusade was negligible, or that the effort of the great school men was in vain. Rather, this paper shows how political economy factors worked behind the scenes of the eminent success by the crusade. This approach is adequate and necessary because free schools were achieved through raising more tax revenue, which required endorsement by voters.

Scholars have endeavored to explain what helps to raise investment in education, developing political economy approaches to education and other social policies. Though a general consensus on the role of inequality in the development of public education and redistributive policies was barely unveiled, the mid-19th century American school finance system

[1] For example, Easterlin (1981).
[2] The tax-based social spending for schools was miniscule everywhere in the world by 1850. Lindert (2004), pp.8-11.

based on property taxes helps me propose a hypothesis that rising average value of taxable properties and growing inequality in property holding were the major forces that promoted free schools by abolishing tuition fees for public schools and raising more tax revenue for schools. The rise of average property values had a positive wealth effect. Growing inequality in property holdings raised the share of voters who bore no or a negligible tax burden, when schools were funded by property tax. When American democracy developed enough to allow voters to seek their own self interests without being dominated by political elites, the voting equilibrium changed toward imposing the financial burden of educating children on the taxpayers instead of their parents.

Tests by hazard model regressions using interstate variation in the establishment of state free school systems support this prediction of the political economy theory. The hazard rate is defined as the likelihood that a state would build a free school system, given that the state has not yet built the system. The results show that a rise in the average property value was indeed a major force in making American schools free. Further investigation using vote returns from the free school referenda in New York and Indiana reasserts the role of political economy factors including average property value and wealth inequality.

The political economy theory also implies a redistributive consequence of the transition toward tax-supported free schooling. This implication is again well captured by two different econometric analyses. Logit regression results using 1850 and 1860 family-level census data show that the free school system considerably reduced the effect of family wealth on children s school attendance. Regression results using pooled state-level census data reveal that intra-state enrollment inequality diminished as public school income grew due to the establishment of state free school systems. These results confirm that the financial burden of educating children was transferred from parents to taxpayers and from poor to rich locations by implementing statewide free school systems.

A political economy approach to the formation of universal free elementary schooling in the United States is not entirely novel. Ellwood Cubberley, an early 20th century pioneer of American education history, carefully described historical changes in socio-economic backgrounds during the era of the common school crusade in his seminary book, *Public Education in the United States*.[3] Among recent researched, work by Stanley Engerman and

[3] Cubberley (1919), Chapters IV and V.

Kenneth Sokoloff which sought the links among factor endowments, suffrage, education, and inequality is salient.[4] Meanwhile, this paper offers empirical tests of political economy hypotheses exploiting historical data on antebellum American public school finance collected from contemporary state school reports, newspapers, research publications, and censuses, which are unprecedented by both historians and economists. By focusing on the period between 1850 and 1870 when most states established the free school system, this paper also successfully builds a bridge between the research on the early development of American public schools before 1850[5] and that on the legal compulsion of schooling after 1870[6] or the high school movement in the early twentieth century.[7]

The findings in this paper have various implications for both past and present. The main results of this paper support the view that growing political voice of the public fostered economic growth. Universal free schooling chosen by voters was indeed a pro-growth redistribution policy that helped human capital accumulation and contributed to economic growth.

Development of Free Schools in America

As of 1850, less than 50% of the U.S. public school revenue came from local taxes. There were few state taxes, and more than 20% of the revenue was collected by private contributions including rate bills, which were user-fee type charges against the parents of pupils.[8] However, as depicted in Figure 1, the share of revenue from taxes rose after 1850 and became 100% around 1925. The rapid expansion of school tax revenue revealed in Figure 1 is more striking given that the total public school revenue itself was greatly increased from 9.6 million dollars in 1850 to 64 million dollars in 1870 and 1.8 billion dollars in 1925.[9]

[4] Engerman and Sokoloff (2005).
[5] Fishlow (1966a); Field (1970); Go and Lindert (2007).
[6] Landes and Solmon (1972); Margo and Finegan (1996); Moehling (1999); Lleras-Muney (2002); Goldin and Katz (2008).
[7] Goldin and Katz (2008).
[8] These facts are from Figure 1 based on the decennial census compendiums. The amount of private contributions are estimated by other sources in the census report, which include all the other incomes that were not from taxes, funds, and endowments, but were mostly from rate bills or similar forms of private user charges. This view is supported by investigation of various state school reports, though the census report does not explicitly provide any evidence regarding the amount of rate bills.
[9] These figures are from the 1850 and 1870 census compendiums and *the Historical Statistics of the United States, Millennial Edition*. Th

How did Americans increase the tax revenue for public schools so greatly? How were they able to replace private user fees for public schools with tax revenue? Why was tax revenue insufficient in the early period, and why did they have to charge those fees to the parents of pupils? To answer these questions and analyze the transition toward tax-funded free public schools, the initial condition of public school finance in the United States must first be investigated.

The origin of American public schools dates back to colonial times. Early settlers in Massachusetts and Connecticut built schools to teach children reading, writing, and arithmetic as early as the seventeenth century.[10] Those schools, later known as common schools in the nineteenth century, were *de facto* public schools, as they were established, managed, and financed by collective decisions such as town meetings. They were also intended to educate all the children in the town, though not mandatory by that time.[11]

Local property taxes were traditionally the major way to finance American public schools.[12] When local public schools were voluntarily built and managed by town meetings, the local property tax rate to finance those schools was also determined by voters. However, there was a dilemma with this system which arose principally before 1850 -- the amount received from voluntarily raised local property taxes was typically insufficient to properly manage schools, due to poor tax bases and opposition to taxation. Hence, most public schools had to charge partial fees to the parents of pupils, which consequently excluded indigent children from public schools.

Indeed, many alternative methods were exploited to raise sufficient public school income without resorting to the private user charge idea. Poll, bank, and insurance taxes as well as lotteries and fines were popular in many states until the mid-nineteenth century. States also apportioned incomes from permanent school funds as a matching fund, requiring each locality to raise a certain amount of revenue by local property taxes.[13] But, those alternatives were not very

[10] Updegraff (1969), Chapters 1, 2, 3 and 4; Cubberley (1919), Chapter 2.
[11] The first compulsory schooling law was enacted in 1852 in Massachusetts. Most state compulsory schooling laws were enacted after 1870. Cubberley (1919), Chapter 8.
[12] Though most states allowed localities to raise taxes for schools by enacting permissive state laws in the first half of the nineteenth century, many local towns raised voluntary property taxes before the enactment of those laws. For a comprehensive list of state legislation permitting local school taxes before 1850, see Cremin (1951), p.127.
[13] Starting with New York in 1805, all the states created state permanent common school funds in the nineteenth century. Two major sources for the public school funds were federal land grants following the Land Ordinance of 1785 and federal grants of the 1837 surplus revenue. Some states apportioned these grants directly to localities instead of forming state public school funds. (Swift, 1911). State school taxes were not introduced until the mid-nineteenth century.

successful in raising sufficient school revenue, as the number of school aged children and their demand for public schooling grew faster than public monies.

Therefore, it became very popular in most states in the early nineteenth century to defray the deficiency in public school income by charging *pro rata* payments to the parents of pupils. These charges were called rate bills,[14] as they were levied on the parents in proportion to the number of children attending schools and their days of attendance. The first rate bills date back to seventeenth century colonial Connecticut, and the rate bills spread widely over the country during the nineteenth century.[15] In the early period, rate bills were only used to pay for teachers salaries, but ultimately evolved to be a tax specifically charged to the parents of pupils, not the general taxpayers. The total amount of rate bills was determined at the end of the year when the deficiency in public school income was uncovered. Then, rate bills were collected as ordinary tax-bills.[16]

Apparently, rate bills were a great barrier that impeded universal provision of primary schooling. Children from indigent families who were not able to afford the fees were immediately banned from public schooling. Sometimes state laws excused those children from the payment of rate bills, but worries about the stigma of indigence discouraged people from using this op1 0 0 79 0 d 1 d14.den-US ng

To what extent were early American public schools financed by rate bills? The earliest figure shows that it was enormous. In New York State, which was the first to establish the state common school fund and where the local tax idea was widespread, the amount of rate bills was at least three quarters of the total school revenue until 1825.[18] Then, the amount of rate bills declined over the remainder of the century. According to Figure 1, the amount of rate bills decreased from 22.4 percent of the total school revenue in 1850 to 7.9 percent in 1870. Table 1 confirms this downward trend in five states where rate bills were repealed in the 1860s. In these states, the share of total revenue from rate bills continuously declined until they were abolished by legislation. As rate bills diminished, the size of tax revenue rose considerably and substituted for private contributions, making public schools entirely free.

Figure 1 also shows that this transition from rate bills to tax-supported schools was impressive in particular between 1850 and 1870. Indeed, during this period, eighteen states in the country abolished rate bills and established a state free school system, as reported in Table 2. Though some states such as New Hampshire or Massachusetts achieved the state free school system earlier than 1850, the majority of American states lagged behind until this period when they were able to replace rate bills with a greater amount of property tax revenue.

Another important characteristic during this period is the fast rise of state taxes for public schools. There were few state school taxes before 1850, yet by 1873 twenty-six states had established state taxes for public schools, and the share of the total U.S. public school income from state taxes rose to 17.3%.[19] The implementation of state school taxes was in the same line with the centralizing tendency in the mid-nineteenth century public education. Most states had established state public school systems by the early 1870s. State Superintendents were appointed to direct the system, and states increasingly intervened in the finance, quality, and management of local schools. This state centralization is well known to have improved funding and school

[18] New York State *Report* (1825), p.39. While these figures are conjectures, they are supported by various descriptions that there was a rule of

Education has been major subjects in the recent development of political economy literature, but a clear consensus on the role of inequality in promoting universal primary schooling as a redistributive social policy. A view proposed first was that inequality leads to greater political pressure from the bottom to implement redistributive policies including public schools, but distortion caused by taxes for redistribution would hamper future economic growth.[22] In contrast, a recent view argues that inequality is in fact a barrier to promoting education, which is in reality a pro-growth social policy.[23]

Meanwhile, the American experience in the mid-19th century helps to efficiently deal with the complications from different models and settings proposed by scholars, as it simplifies the way of financing schools during the transition period to free schools. The rate bills were repealed by raising more school taxes to substitute public resources for private user charges. Therefore, the establishment of an entirely free public schooling system in nineteenth century American history can be captured by a model that explains how the school tax rate increases. Below is an illustrative model where the school tax rate is driven by political economy variables such as i[illegible]y in property holding or average property values, depending on which tax was used for [illegible]evenue.

[illegible] a locality that has a public school financed by a local tax. In mid-nineteenth [illegible] the school tax was mostly a [illegible] tax. Here, I examine [illegible]ses separately. Th[illegible]iority voting. For si[illegible] assume that the locality h[illegible] and each voter has [illegible]age child. To en[illegible]xistence of the majorit[illegible]brium, each voter must hav[illegible]peaked utility [illegible]f schooling. Once th[illegible]ool tax rate is determined by vo[illegible] voter choos[illegible]vidual rate bill as a [illegible]pplementary payment to support [illegible]. The voter [illegible] also a function of [illegible]n, which includes the private rat[illegible]ment. Suppo[illegible] is the utility fun[illegible]s tax rate [illegible]cal public school su[illegible]

8 0 0 8 Tf1 0 0 1 104.3 19[illegible] 30] 1[illegible]Tc[(85DB975T11(a)

where is the indirect utility function of the individual, is consumption,[24] and is the local provision of public schooling.[25]

Property Tax

Suppose public schools are financed by a local property tax. Each voter is assumed to have income and a taxable property of assessed value . When the prices of C and S are normalized to one, the household budget constraint implies that and the government budget constraint implies that , where is the average value of taxable properties in the locality *l*.[26] The first order condition for each voter s most preferred tax rate gives the decision rule such that

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The left hand side is the marginal rate of substitution between local provision of public schooling and private
schools.

The assumption of single-peaked preferences guarantees the existence of the median voter solution. In equation [1], each voter s price of the local property tax is determined by the value of the voter s own taxable property. Therefore, the local property tax rate is determined by the following decision rule.

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This decision rule gives an interesting implication about the effect of the change in the property holding distribution on the level of local provision of public schooling. When the distribution of local property holding becomes more unequal by more voters having fewer taxable properties, the right hand side will decrease. Then, the left hand side should also decrease

[24] Consumption includes private payments for schooling such as rate bills and subscriptions.
[25] Though I assume that each voter has one child, this model can be extended to the case with multi-children families or childless voters. Because each voter could have a different utility function, their marginal utilities of schooling could also differ. Meanwhile, I do not exclude that a childless voter could have positive utility for local public schooling. The provision of public education could affect individual utility through various channels. Examples include an increase in consumption due to substituting expensive private schooling with cheaper public education, elimination of the voter s perceived risk of own or neighbor s crimes, stigma of indigence, or adolescent aberration in a community, or an increase in productivity of children as future family workers.
[26] The product of this average property value and the tax rate gives school tax revenue per child, as we assumed that every voter has one child.

to hold the equality of equation [2]. This implies that the local provision of schooling must increase relative to consumption. Therefore, greater inequality tends to raise local provision of public schooling.

Poll Tax

Now suppose that public schools are financed by a poll

necessarily changing the equilibrium tax rate. Therefore, we predict that the rise in the average property values will raise the local provision of public schooling.

Possible Collusion between Top and Bottom against Middle

A problem with the median voter model described above is the possibility of collusion between those at the top and bottom of the distribution against the middle.[27] If the opportunity cost for schooling is considered, the net benefit from schooling for the poorest group of voters would diminish. Then, the effect of inequality and average property values could not be clearly shown as predicted in the model above.

However, this may not be a problem for identifying the marginal effect of inequality and average property values. Though the possible collusion makes the median voter solution unclear, the decision rules of equation [1] and [3] still hold. Therefore, when inequality rises, there will be more voters whose property tax price becomes lower, under the property tax regime. Consequently, it would be more likely that the decisive voter in the locality will prefer greater provision of local public schooling. Similarly, the rise in the average property values would affect all the voters in the same way, and the number of the voters who prefer more public schooling would increase. But there will be still no effect if local public schools are financed by a poll tax.

We can learn more about this marginal effect and its true nature by looking at the mid-nineteenth century data. Indeed, we have voter returns at the free school referenda of New York and Indiana in the mid-nineteenth century. In the following section, the effect of inequality in property holding and average property values will be tested first nationwide, then by using these two state returns.

A Hazard Model Analysis of State s Repeal of Private Tuition

The diverse timing in establishing free school systems among states allows us to test the theory developed in the previous section. Using the 1850, 1860, and 1870 decennial census data, a hazard model can be set up. The period between 1850 and the year when a state repealed rate bills or established a tax-supported free school system by state legisla

[27] There is a dense literature surrounding this issue. For example, Levy (2005) provides a solution for the case when there is collusion between young, old, poor, and rich groups. Go and Lindert (2007) also provides some evidence of the nonlinearity of the effect of extended suffrage on the provision of public schooling.

The time-varying covariates here include political economy variables that play an important role in the theory developed in the previous section. These variables and other covariates are constructed from the decennial census compendium and IPUMS 1% samples for 1850, 1860, and 1870. The inequality in property holding is captured by two variables: the percentage of white males aged 21 or older who individually owned no real estate, and the coefficient of variation of the

property value is captured by the true value of real and personal estates in 1860 dollars divided by the number of children aged 5-14. Other control variables were included to allow for influences suggested by alternative theories. The number of teachers per white adult aged 20 or older is included to c school m emphasizing the effect of the top-down movement by groups of teachers and educators for several reasons including progressiveness, altruism, and their self economic interests.[33] The number of white kids aged 5-14, manufacturing capital in 1860 dollars per white male aged 20 or older, the number of Catholic church seats per 100 people, urban population shares, and south dummies were imposed to evaluate the possible influence of population pressure, capitalism, urbanization, and the Southern political regime.

The results reported in Table 3 show robust results for all the specifications. First, the rise in average property values apparently reduced the time to establish free schools. The coefficients estimated ranged from -0.13 to -0.15, suggesting that a 1,000 dollar increase in the average property value would shorten the time to build the state-wide free school system by about 14%.[34] The increase in the size of the teacher group showed a consistent effect, though the statistical significance diminished in the full covariates specification. The estimates imply that a state s having one more teacher per 1,000 white adults reduced the time until statewide free schooling by about three percent.[35] But extra caution must be exercised in the interpretation of this variable. The variable possibly represents a collective desire to have more teachers and education, rather than the simple political or lobbying power of the teacher group.

[33] Goldin and Katz (2008), pp.146-149. They introduce the school men theory but lend more weight to the local grass-root movement as a major source of the rise of free schools. West (1975) argues that the free school movement was led by the lobbying group of teachers motivated by their own economic interests.

[34] The median of the property value per white kid age 5-14 is $ 1,809 in 1860 dollars. The sample standard deviation is $ 1,393.

[35] The sample s median and standard deviation of teachers per 1,000 white age 20 or older was 10.00 and 5.00 respectively.

The estimated effect of variables related to the inequality in property holding was noisy and not statistically significant. In the previous section, the political economy theory predicted that the effect of the inequality would be different depending on which tax would be used for financing schools. In the mid-nineteenth century U.S., both property and poll taxes were popular. Therefore, the role of the inequality would not clearly emerge in the nation-wide analysis.[36]

The impact of the number of white kids aged 5-14 per white adult aged 20 or older was also notable. When there were 10 more kids per 100 adults, the time to establish free schools was decreased by about 17 23%.[37] If there was no big difference in fertility across states, this means that more kids represented more parents who preferred free schools. Otherwise, it could be interpreted as higher fertility societies favoring free tax-supported schools. The Catholic share also returns interesting results. One more seat in Catholic churches per 1,000 people shortened the time to state free school systems by at least 14%.[38] This does not necessarily mean that Catholic churches supported free schools, which would contradict the existing literature. Instead, this effect might be caused by the fact that the proportion of Catholics was greater in the Northeastern states where state free school system was established earlier and foreign immigrants were centered. Also, growing concerns about educating Catholic immigrants in common schools rather than Catholic schools is most likely related to this estimated effect.[39]

Overall, the hazard model test results support the role of the rise in the average property value in moving states toward universal public schooling. A higher average property value was helpful, as it enabled taxpayers to afford free schools of given quality at a lower tax rate and tax price. On the other hand, the results do not reveal any clear effect of changes in wealth inequality, as its effect was quite different depending on which tax was used for. In the following section, the complicated role of the inequality will be more thoroughly examined using data on vote returns from the New York and Indiana free school referenda in the mid-nineteenth century.

Who Voted for Free Schools: Two State Tests

The predictions by the theory developed in the previous section are also confirmed by tests using free school referenda returns in New York and Indiana. These states held free school

[36] The role of the inequality in property holding will be further examined by two representative states.
[37] The sample median and standard deviation were 0.54 and 0.12, respectively.
[38] The sample median and standard deviation were 3.42 and 12.36, respectively.
[39] Cubberley (1919), pp.171-181.

referenda around 1850. While the situations in these two states were quite different, all the referenda, two in each state, aimed at the statewide establishment of free schools supported by taxes. The free school idea won all four times, though the ideal was not realized immediately after the referenda. Vote returns from all four referenda show a clear geographical variation that offers a test of theories regarding the establishment of the free school system.[40]

The New York referenda in 1849 and 1850 concerned statewide repeal of rate bills. Public schools in New York at that time were funded by state common school fund income, local voluntary property taxes, and rate bills. In 1848, the share of rate bills in total school income was 36.3%, and greater in the countryside given that major cities had already abolished rate bills.[41] The Common School Crusade swept New York in the 1840s, and following a fierce progressive movement to make public schools entirely free, the Free School Bill of 1849 to repeal rate bills everywhere in the state was put on the table at the 1849 state referendum.[42] The bill was sanctioned with a majority of 158,181 votes.[43]

But, the execution of this bill soon aroused furious objections. The free school act that asked every school district to substitute rate bills with district property caused financial difficulties. Most rural districts became hostile to the act because it imposed a heavy burden of local taxation. Public opinion was sharply divided, and legislators called for a new referendum in November 1850 to ask whether or not to repeal the 1849 act. In the new referendum, majorities in most rural counties voted to repeal the act, but the vote went against them because the populous urban areas, especially gigantic New York City, voted against the repeal of the 1849 Free School Act.[44]

County-level regressions of the percentage of votes for free schools on the political economy variables offers a chance to have a closer look at the theory explored in the previous section. Vote returns are collected from contemporary reports and newspapers. Covariates

[40] Cubberley (1919), pp.134-137 and pp.147-150.
[41] Contemporary New York state school reports show that large cities such as New York, Albany, and Buffalo where rate bills were repealed were running a big surplus in public school revenue but had lower enrollment rates compared to the countryside. This suggests that the local optima in these big cities were caused by higher average property value or greater inequality in property ownership distribution rather than demand-side factors.
[42] The bill mainly proposed two changes in the state public education system: replacing rate bills with school district taxes, and extending school ages from 5-16 to 5-21 years old.
[43] Though the total number of votes in the 1849 New York referendum is not found, this figure is considerably large when compared to the 1850 referendum statistic. In the 1850 New York free school referendum, the total number of votes was 393,654. Finegan (1971), pp.197-198 and 462-463.
[44] New York Assembly Journals and documents for 1850 and 1851.

including political economy factors and other control variables are constructed from the 1850 decennial census compendium and IPUMS 1% sample. The results are reported in Table 4. For the 1849 referendum, only net majority for free schools is available for the dependent variable. However, the 1850 regressions give robust results regardless of which dependent variable is used. The proportion of voters individually owning no real estate, the average taxable property value, and the share of urban population mattered for the cross sectional variation. Wealth inequality, as measured by the proportion of voters individually owning no real estate, now plays a critical role here because the referenda were directly related to an increase in the burden of property taxes. The Free School Act in New York State was designed to shift the burden of educating children from parents to property owners. Hence the significant effects of the proportion of voters individually owning no real estate and of the average taxable property values that directly affected the individual price of property taxes are consistent with the prediction from the theory in the previous section.

Indiana also had two state referenda for tax-supported free schools in 1848 and 1849. The Common School Crusade rolled through Indiana in the 1840s, and it led to a proposal to introduce a state property tax as well as a poll tax for public schools. The proposal also required each county to raise the same amount as a local tax to support a public school. But the proposal was strongly opposed by representatives from the central and southeastern counties that were predominantly settled by migrants from the South and barely maintained public schools aside from some charity or pauper schools. [45]

What the legislature asked in the first referendum in 1848 was only a non-binding question about the idea of implementing free schools by imposing state taxes. The result was affirmative to the free school idea, but the fierce opposition to state school taxes in most central and southeastern counties was still a great obstacle. Therefore, the legislature changed the bill from state taxes to county taxes, and gave each county the authority to decide whether they would implement the plan locally or not in the second referendum in 1849. The referendum results by county were very similar to those of 1848. Out of ninety counties, sixty-three voted in favor of a one-mill county property tax and a 25-cent poll tax on behalf of schools.[46]

[45] Boone (1892).
[46] Boone (1892).

legislation on enrollment rates understate the overall effect of making schools entirely free and raising more taxes.[47]

Though comprehensive data on the timing at which American locality made their own schools free are not available yet, the consequence of making public schools free in America can be partially captured using the year of state establishment of free school systems when the estimation method focuses on the people who got the free schools through such legislation. The mid-nineteenth century legislation set up two kinds of redistribution. Substituting rate bills and subscriptions with property taxes meant shifting the burden of educating children from parents with no or a small amount of taxable properties to the large property owners. This was redistribution from taxpayers to parents. An introduction of state taxes redistributed tax revenue from rich to poor localities. These two features offer two different tests that capture the consequence of making schools free.

Table 6 shows the result of logit regressions using 1850 and 1860 IPUMS 1% samples. The dependent variable is a binary indicator depicting whether a child attended school or not. As IPUMS allows us to identify each family unit and match children s data with those of their parents, various family and parental istics can be exploited in the regressions. The covariates include the total value of real properties owned by any family members of the child, and an interaction variable of this family wealth with an indicator showing the statewide establishment of free school systems from Table 2 to see if those state laws altered the effect of family wealth on t
that the state free school legislation helped children s education become less dependent on their father s wealth. The results are robust to the use of the total value of real estate owned by the family to measure family wealth, instead of father s wealth. The effect of father s wealth on children s school attendance diminished over time, and disappeared before 1860 in the North and Midwest as most public schools became free and the size of rate bills became smaller.

Another test looks at the effect of geographical redistribution within a state. The state free school legislation was focused on the localities that were not able to achieve free schooling by their own local equilibrium. They were mostly remote and economically disadvantaged places

[47] Indeed, some difference-in-difference estimates using IPUMS 1% samples that are not reported here show very complicated results. The comparison between New York and Massachusetts also lies in the same line. See Goldin and Katz (2008), pp.145-146.

where local taxable properties were too limited to raise a sufficient amount of tax revenue. State legislation helped them make their schools free through geographical redistribution.

The seventh and ninth decennial censuses provide county level school attendance rates. Using this information, indices showing the inequality of attendance rates across counties can be constructed for each state.[48] Table 7 shows how the increase in public school income through state free school legislation affected the intra-state inequality in enrollment rates. All three inequality indices clearly decreased as more public support was supplied. The two stage least square models also show robust results, implying that the establishment of state free school systems contributed to the decline of geographical inequality in enrollment by ameliorating school funding in remote and

lines as the thesis, whereby investment in general human capital through redistribution apparently promoted growth.[51]

It must be at least partly true that local property taxes are a benefit tax that coordinates [52] But it does not seem to be a very plausible explanation for the rise of school taxes in the nineteenth century. Many rural towns with lower assessed property values were not less enthusiastic about developing public schools than were urban centers, as we can easily find that the enrollment rates were higher in the rural North than urban areas.[53] The rural yearning for free public schools was hindered by poor tax bases, and subsidiary private contributions in the form of rate bills were demanded. The rate bills could be eliminated only after the geographically redistributive state taxes arrived. Another counter example against the benefit tax theory is the movement of abolishing the school district system. This movement emerged all across the country throughout the nineteenth century. Starting from Massachusetts, a system of very small independent school districts was criticized as one of the factors that hindered development of tax-supported public schooling.[54] The district system was repealed state by state, and the basic unit of school

Conclusions

Universal free public schooling in the United States started in the mid-nineteenth century when rate bills were repealed and the state school system was established. The considerable increase in the property tax revenue was the most important prerequisite for this transition. This paper developed a political economy theory that explains the increase in tax revenue to achieve free schools by changes in the political economy variables such as the average property value and wealth inequality. The rise in the average property value enabled Americans to afford free schools at a lower tax rate. Changes in inequality in property holding helped the majority of voters shift the financial burden of educating children toward the rich minority when schools were financed by property taxes. Hazard regressions and closer investigation of two state referenda statistically supported this prediction of the political economy theory. This paper also found empirical evidence that the provision of free schools diminished the importance of family wealth in educating children, and that the state legislation of free schools contributed to the decrease in the intra-state inequality in providing public schooling.

The findings in this paper do not nullify the contributions such as Horace Mann or Henry Barnard to the development of American public education. The theory and test results in this paper rather show the underlying mechanism that determined the outcome of referenda or other collective decision making processes through the is actually what a top-down explanation for the history of American education has been missing.

The political economy theory developed in this paper also helps to explain why the U.S. achieved universal provision of free schooling earlier than Britain and Latin America. The U.S. successfully extended suffrage to all white adult males mostly by the mid-nineteenth century and implemented property taxes to support public schools. By contrast, the extension of suffrage was much later in Britain and Latin America. Inequality in property holding was not helpful for implementing pro-growth redistribution policies when the political power was dominated by wealthy elites.

The theory and model in this paper explain local initiatives as well as later state intervention. Local autonomy was undoubtedly important at the dawn of American public schools. Many localities voluntarily raised local property taxes for public schools, which enabled the United States to be a global leader in school enrollments by the middle of the nineteenth

century. But decentralization has not been a perpetual virtue.[55] Heavily localized public school finance impeded further development of public schooling in places where taxable resources were limited. The aid from state property taxes was a proper remedy for the problem, through geographical redistribution.

The development of state property taxation for public schools needs further investigation. Aside from the political economy variables that are explored in this paper, there is another interesting factor. This is the possibility of positive externalities from public education. Positive externalities could explain how state intervention through geographical redistribution improved the efficiency of the school finance system. In reality, numerous nineteenth century school reports frequently revealed great interest in the effect of education on reducing crime and eliminating stigmas on children whose families were not able to afford rate bills.

Another important question following from this paper is the long run shift in the shares of local and state sources in public school revenue as described in Figure 1. One interesting thing is the decline of state property taxes after 1875. Though the share of public school revenue from all state sources had not decreased, state school taxes were repealed in several Northern states in the late-nineteenth century, and local taxes again became dominant sources for public school finance. This revival of localization in some states continued until the 1920s when the share of local funding started to decline as the state funding share rose. Why did the centralizing movement in mid-nineteenth century public school finance not last longer, and how did school funding eventually regain its local character at the end of the nineteenth century? Why was the trend reversed in the middle of the 1920s? These questions are central to future research on the history of American school finance.

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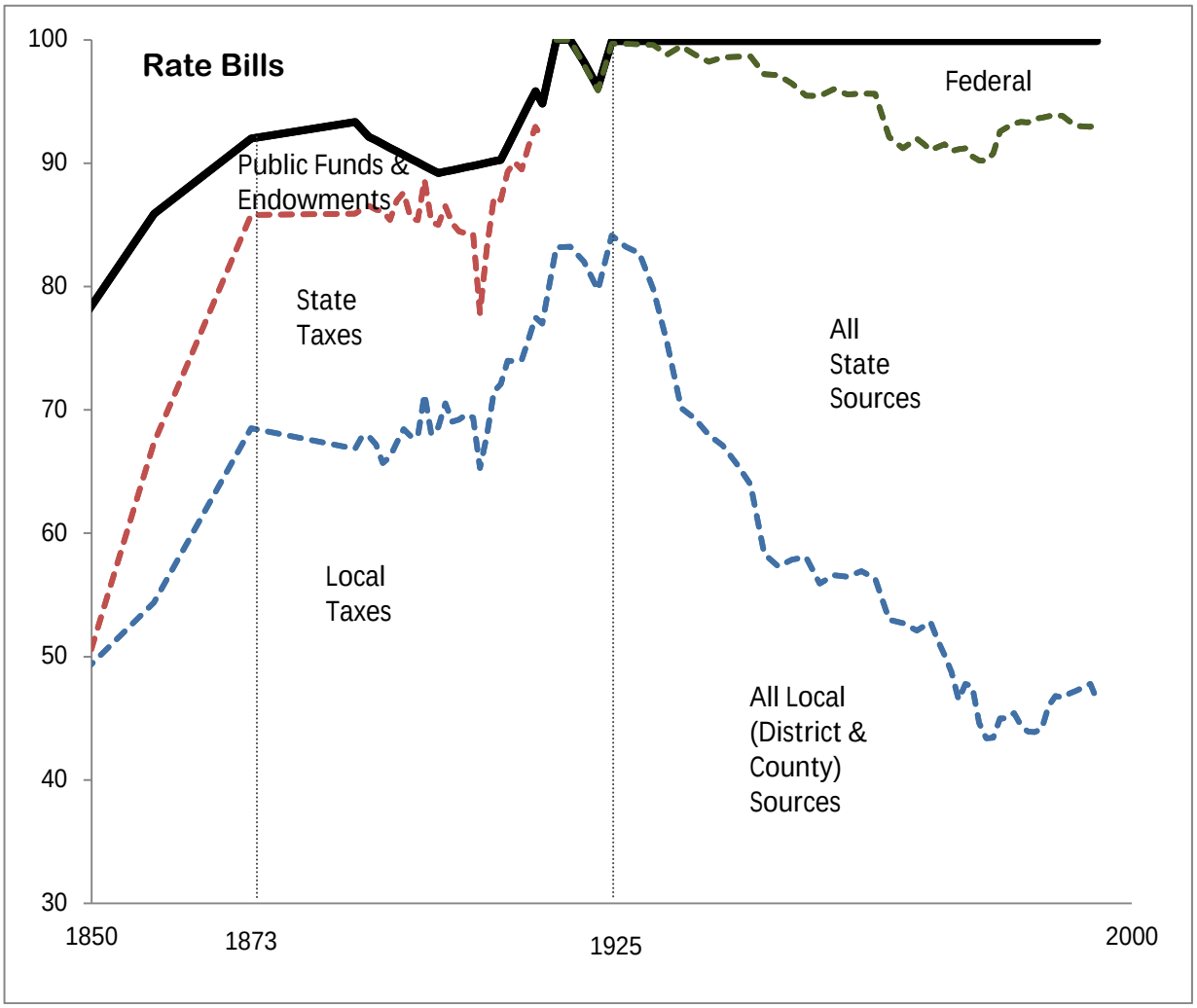
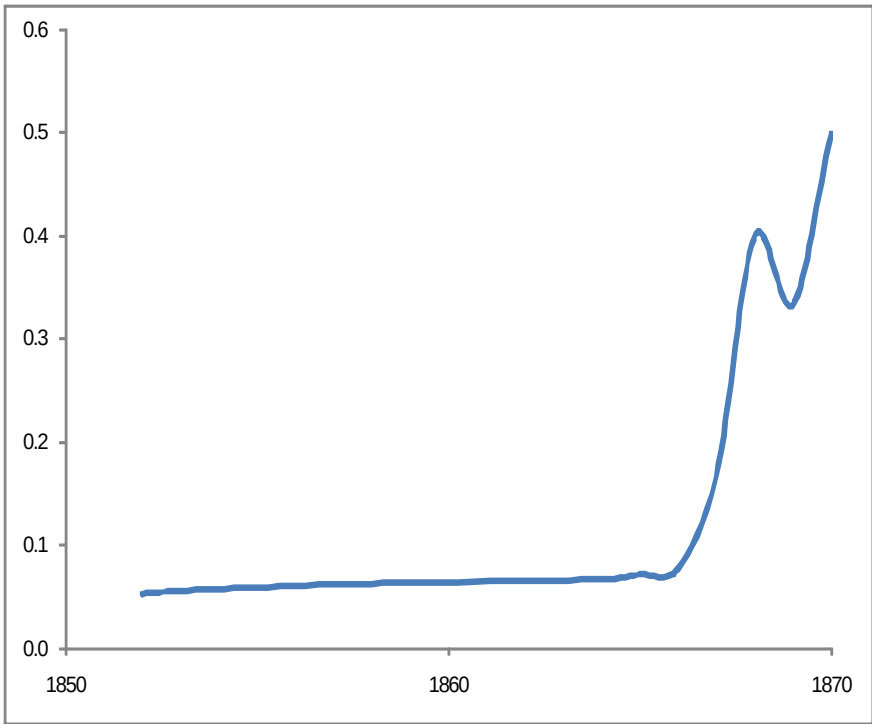
Figure 1. Sources of Revenue for U.S. Public Schools, 1850 - 1995



Sources: The 1850 and 1860 decennial censuses, U.S. Commissioner of Education *Reports* for 1874-1917, and *Historical Statistics of the United States -- Millennial Edition* for 1917-1995.

Figure 2. Kaplan-Meier Estimate of Hazard Rate for State Abolition of Rate Bills



Data: Table 2.

Table 1. The Share of Parents Rate Bill Payment in Total Public School Revenue, 1846-1870

Year	CT	MI	RI	NJ	NY
1846		14.6			37.5
1849		12.2			37.5
1850		13.0			11.7
1851		20.4			17.6
1852		11.6			18.6
1853		12.9			16.9
1856	10.0	18.3			
1863	7.3	4.7			8.3
1864	8.0	5.0	4.2		8.5
1865	11.0	6.8		7.9	10.5
1866	13.6	6.2	3.0		9.6
1868	14.2	4.3	0.8	4.9	
1869		3.3		4.3	
1870				2.6	

Sources: State reports and Mead (1918).

Table 2. State-wide Establishment of Free Schools

Year	States	
	Non-South	South
1789	NH(1788)	
1820	ME(1820)	
1827	MA(1788)	
1829	DE((1787)	
1834	PA(1787)	
1847		LA(1812)
1848	WI(1848)	
1852	IN(1816)	
1853	OH(1803)	
1855	IL(1818)	
1858	IA(1846)	
1863		WV(1863)
1864	VT(1791)	
1865		MD(1788)
1866		MO(1821)
1867	NY(1788), CA(1850)	
1868	CT(1788), RI(1790),	SC(1788), AR(1836)
1869	MI(1837)	FL(1845)
1870		GA(1788), VA(1788)
1871	NJ(1787)	
1890	UT(1896)	

Note: The years of statehood are in parentheses.
Sources: Cubberley(1919), Goldin and Katz (2008), Mead (1918), Swift(1911), and several state school reports including 1868 Connecticut Board of Education report.

Table 3. Hazard Model of Political Economy Factors Affecting the Timing of State Abolition of Rate bills, 1850-1870

	[1]	[2]	[3]	[4]
Proportion of voters individually owning no real estate	-0.0177		-0.3873	
	[0.6578]		[0.9041]	
Inequality of real property value measured by the coefficient of variation		0.0186		0.0068
		[0.0576]		[0.0691]
Real and personal property value per kid aged 5-14	-0.1319**			

Table 4. Determinants of Votes For and Against Free Schools in New York State Referenda, 1849 and 1850

	[1]	[2]	[3]	[4]	[5]	[6]
	Net majority for free schools, 1849, as % of franchised men		Net majority for free schools, 1850, as % of franchised men		% of voters that favored free schools, 1850	
Proportion of voters individually owning no real estate	0.3776**		0.4086**		0.4019**	
	[0.1302]		[0.1401]		[0.1469]	
Inequality of real property value measured by the coefficient of variation		1.6839		1.431		1.7197**
		[0.9582]		[0.7542]		[0.5089]
Voting share of the white males aged 20 or older	-2.1059	-9.3948	-27.8998	-37.872	-21.2123	-29.3572
	[21.3453]	[20.8487]	[19.0794]	[19.9712]	[14.9935]	[16.7474]
Real and personal property value per kid aged 5-14	7.6479	10.5188*	11.1895*	14.3953**	11.1055*	14.1796**
	[4.8662]	[4.8287]	[5.1543]	[5.1438]	[4.2384]	[3.9986]
Urban population share	0.0285	0.073	0.1709*	0.2264**	0.2173**	0.2660**
	[0.0820]	[0.0894]	[0.0666]	[0.0768]	[0.0636]	[0.0606]
Number of white children aged 5-14 per white adult aged 20 or older	3.8389	7.9605	-3.4404	1.8778	-1.6548	2.8913
	[23.2126]	[21.5645]	[20.4000]	[19.1477]	[16.4042]	[14.6924]
Constant	-10.32	6.4681	-15.9294	3.6893	29.3855	47.5235*
	[29.1843]	[27.3759]	[25.3555]	[24.2366]	[17.4746]	[18.2506]
Number of Counties	56	56	56	56	56	56
R-squared	0.31	0.25	0.59	0.54	0.65	0.6

Note: Data are 56 NY state conties excluding NYC. The results are robust when NYC is included. Robust standard errors are in brackets. * significant at 5%; ** significant at 1%.

Sources: Vote returns from Finegan (1921). Changes in local tax rates are defined by the amount of rate bills over the assessed value of the total assessed property values, both of which were reported in the Reports of the Superintendent of Common Schools of the State of New York. Real estate ownership and having children distributions were calculated from the IPUMS 1850 1% sample. Urban shares are from the 7th decennial census data compiled by Michael Haines (ICPSR 2896). Voting shares are from ICPSR 08611-v.1. (Ann Arbor, 2006)

Table 5. Determinants of Votes For and Against Free Schools in Indiana Referenda, 1848 and 1849

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	% of vote that favored free schools, 1848				% of vote that favored free schools, 1849			
Proportion of voters individually owning no real estate	-0.347	-0.114			-0.3004	-0.1274		
	[0.2387]	[0.1755]			[0.2005]	[0.1483]		
Inequality of real property v								

Table 6. The Effect of Family Wealth on 5-14 year-old Children s School Attendance

	Non-South 1850	Non-South 1860	South 1850	South 1860
Father's real property value ($)	0.0841**	0.0006	0.1094**	0.0285**
	[0.0091]	[0.0027]	[0.0120]	[0.0048]
Father's real property value * Free school state dummy	-0.0396**	0.0068	-0.1028**	-0.0225**
	[0.0146]	[0.0047]	[0.0131]	[0.0072]
Free school dummy	0.1753**	-0.0629	0.5341**	0.2571*
	[0.0349]	[0.0402]	[0.0911]	[0.1207]
Rural dummy	-0.2890**	-0.1843**	-0.5158**	-0.2116
	[0.0446]	[0.0583]	[0.1087]	[0.1394]
Farm dummy	0.0099	0.0301	0.2351**	0.2263**
	[0.0320]	[0.0391]	[0.0654]	[0.0774]
Age	0.1318**	0.2109**	0.1705**	0.2462**
	[0.0050]	[0.0063]	[0.0097]	[0.0110]
Female dummy	-0.0643*	-0.0496	0.0401	0.0132
	[0.0277]	[0.0332]	[0.0536]	[0.0602]
Number of own siblings in household	0.0408**	0.0468**	0.0114	0.0165
	[0.0070]	[0.0085]	[0.0131]	[0.0144]
1 if father was born in the South	-0.8983**	-0.4177**		

Table 7. Effects of More Funding through Statewide Establishment of Free Schools on the Enrollment Inequality across Counties within States, 1850-1870

Ordinary Least Squares	Theil Index	Coefficient Variation	P90/P10	Theil Index	Coefficient Variation	P90/P10
Public school income per child aged 5-14 (1869 $)	-0.04 [0.02]	-0.06* [0.03]	-0.87 [0.56]			
Public school income from public sources per child aged 5-14 (1869 $)				-0.05 [0.02]	-0.07* [0.03]	-1.02 [0.66]
Constant	0.2 [0.13]	0.37 [0.19]	5.18 [2.86]	0.19 [0.13]	0.36 [0.18]	5.25 [2.84]
R-squared	0.76	0.87	0.66	0.76	0.87	0.67

Two Stage Least Squares	Theil Index	Coefficient Variation	P90/P10	Theil Index	Coefficient Variation	P90/P10
Public school income per child aged 5-14 (1869 $)	-0.02** [0.00]	-0.04** [0.01]	-0.41** [0.10]			
Public school income from public sources per child aged 5-14 (1869 $)				-0.02** [0.01]	-0.05** [0.01]	-0.41** [0.10]
Constant	0.11** [0.04]	0.40** [0.06]	3.88** [0.61]	0.11** [0.04]	0.41** [0.06]	3.84** [0.60]
R-squared	0.13	0.33	0.17	0.13	0.32	0.16

Note: The data consist of 60 observations of 30 states from the 1850 and 1870 decennial censuses and IPUMS 1% samples. The District of Columbia is excluded from the previous data set, and California is excluded for the models of the ratio of 90th percentile to 10th percentile. School incomes are in 1860 dollars, adjusted by CPI from *Historical Statistics of the United States, Millennial Edition*. For the two stage least squares model, school incomes were instrumented by the binary variable of state abolition of rate bills, percentage of voters owning no real estate, coefficient of
estate ownership, property value per child aged 5-14, percentage of school incomes from private contribution, year and state fixed effects. Public sources include taxes, public fund income, and endowment income. All models include the share of public school income from private contributions, and its effects are clearly zeros for all the models. Year and state fixed effects are also included in the OLS models. Robust standard errors in brackets; * significant at 5%; ** significant at 1%