

Was Lil' Johnny Left Behind? Differences in Primary School Educational Attainment Due to Reliance on Local Funding, 1935-1955

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Abstract (as of mid-September; needs to be updated):

The United States decentralized system of education has been applauded for its ability to adopt educational innovations quickly, yet has also been attacked for its variation in quality of public schools resulting from its reliance on local tax revenues. Understanding the tradeoff of these two outcomes of this system is essential to determining the performance of the American system of education in the early twentieth century. This study tests if diminishing marginal returns in spending to education existed and if variations in local school district funding led to significant variations in the accumulation of human capital. A panel data test will determine if local funding for rural primary schools created differences in student attendance, graduation, and performance in high school for the period of 1935 to 1955. An estimate of the cost of this variation in comparison to a situation in which all schools received equal funding will then be made.

Introduction and Motivation:

Claudia Goldin, in her 2001 presidential address to the Economic History Association, described the twentieth-century as the “Human Capital Century.” The first half of this century indeed saw the rapid increase in the amount of Americans obtaining high school education. High school enrollment increased dramatically from approximately 10 percent in 1900 to 70 percent by 1940 (Goldin 2001). This advance in education led to a dramatic increase in productivity of American, or in Goldin’s case, lowan workers (Goldin 2000). This achievement becomes even more pronounced when contrasted to the development of secondary schooling in Europe and the rest of the world during this time (Goldin 2001). The rapid diffusion of high schools stands as tribute to the decentralized system of locally provided schools within the United States at this time.

Efforts during this time to establish educational innovations were not just made with respect to secondary education. In the early 1900’s, the same time when the high school movement began, educators began to push for the reduction in variation in funding between rural, primary common schools and for the consolidation of these schools into multi-room, multi-teacher elementary schools. For example, New York passed in 1914 a law allowing district superintendents to force consolidation without the consent of the local taxpayers (Shelby 1923). As early as the 1930s, studies of rural schools showed, albeit rather crudely, that there appeared to exist diminishing returns in educational spending, a reason to equalize school funding, and that economies of scale in education could be achieved by teachers specializing in subjects and grades (Powell 1933). Yet, unlike the case of high school adoption, these efforts failed in convincing local school boards to adopt these practices. Instead, resistance by rural communities quickly ground

to a halt any progress that had been made in modifying primary education. In the case of New York in 1914, the courts support of the consolidation law “aroused the bitterest opposition” to any consolidation efforts (Shelby 1923). As a result, the one-room school house, complete with its tiny class sizes, remained on the American landscape well into the 1950’s.

The grand purpose of my work is to uncover the cause of or, at least, describe the belated decline of the common school in the United States.¹ To achieve this goal, the following three research agendas must be pursued: first, describe the decision mechanism used and determine the factors considered by school boards and school district members for increasing taxes for school revenue and for consolidation; second, measure the benefits and costs of local control over school finance and consolidation; and third, determine the effect of state intervention on local finance and consolidation decisions. Due to the complexity of this issue, this particular study will only focus on one part of the above three research agendas, namely variation in local finance.

The financing of rural school districts in Illinois and Missouri was based primarily on the decision of school boards and the vote of their constituents over how much property would be taxed for their school district (Illinois Statutes, Missouri Statutes). Due to differing preferences and the conditions that existed for each school district, the amount each school received varied considerably from school to school. The historical explanation for local control was that each community knew best how to educate its own, and that each community was only responsible for its own. This study wishes to determine if these variations caused significant differences in educational attainments by common school children for the period of 1935 to 1955. Further, the hypothesis that

¹ Another way of phrasing this is to determine why common schools persisted as long as they had.

diminishing returns in education with respect to revenue existed will be tested in order to determine if any social welfare gain would be achieved by equalizing school funding.² This period also saw the beginning of state funding being used to control local school policy; the hypothesis that a state dollar is the same as a local dollar for educational attainment will be tested to determine if state money was as efficiently used as local money for the purpose of providing education. Last, judging that diminishing returns to education existed and state dollars were less efficient than local dollars, an estimate of the gain or loss by equalizing funding to all common schools in the sample will be offered to determine the merits of the ‘equalizing school funding policy’ made during this and current times.

The relationship between school expenditure and the quality of schooling has been a frequently studied subject in economics. Since the work of Coleman (1966), economists have increasingly been interested in whether or not the amount of money a school spends per student influences, one, a student’s score on an aptitude test and, two, wages later in the student’s life. Oddly, no consensus has been reached on either effect of expenditure on student performance or earnings.³ As summarized by Hanushek (1996), 15 percent of the 277 studies on this subject have found that increasing expenditure per student increases student performance, the other 85 percent have found that expenditure has no significant effect on performance. Due note, this summary does not account for

² A common explanation for equalizing funding was that the whole of society benefited from education and that society should provide equal educational opportunities to all of its members. The important difference between this mentality and the earlier mentality is one of scale, but this has important consequences. Particularly, under this latter mentality, equalizing school funding, if there exists diminishing returns to education, would transfer money from richer schools to poorer schools where it would be used to obtain larger educational returns than its prior use. Overall, then, society would be better off due to a more efficient allotment of school finances.

³ Given that my work will be focused on school performance, the effect of school expenditure on earnings will only be discussed when necessary.

the quality of these studies.⁴ The degree of this uncertainty of findings carries on to this study in two important ways.

First, the majority of studies on school performance have relied on aggregated state, county, or school district (which is different than school for the period) data for the measure of school quality and school expenditure. These studies are unable to account for specific school background characteristics, such as teacher's ability. This inability to include important control variables may lead to a downward bias on school expenditure, thereby causing the insignificant results of the before mentioned studies. Due to this concern, a few studies have obtained measures for these omitted variables, but, despite these additions, these studies results still remained insignificant on average. A potential remedy for this bias outside of adding more controls is to include school fixed effects, an approach possible only with the use of panel data.

Second, the grand majority of the work on school expenditure's effect on student performance has only been conducted for the period after the mid-1960's. The reason for this beginning date is that aptitude tests only began to be systematically collected at this time. The results of these post-1960 studies (if they were consistent) could be applied to earlier periods if no systematic change in the relationship of expenditure and performance had occurred between these times. However, studies conducted on the effect of school expenditure on later earnings have consistently shown that expenditures matter for the pre-1970 sample periods, while not having significance for after 1970 studies (Betts 1996). Given these findings, a test of the effect of expenditure on school performance for

⁴ I am in the process of reading some of the described studies within this literature; future work will expand greatly upon this literature review and provide much more description of the studies discussed by Hanushek.

the pre-1960 period may find stronger conclusions than the later work on school expenditure and school performance.

Beyond work on the tie between school expenditure and school performance, current work concerned with the recent movements to equalize student expenditure within the United States is also relevant to this study. Since 1970, every state in the United States has adopted some method for equalizing expenditure per student (Hoxby 2001). Several studies have attempted to determine which of these equalizing schemes was most successful in redistribution (see, for example, Fernandez and Rogerson 2003). Caroline Hoxby, though, has extended these studies to consider the effect of these equalization schemes on student performance proxies, particularly attendance of private school and drop-out rates. She finds that equalization significantly increases private school attendance, while lowering the drop-out rate in poorer districts (Hoxby 2001). The significance of her results may be due to the ability of her empirical method (panel data with IV) in accounting for endogeneity.

By applying the methods of these current works, this study will not only be able to expand on the current literature of school expenditure but will also be able to investigate a historically important phenomenon. Specifically, the extent of the variation in school funding for common schools has been attacked by educators as early as the turn of the twentieth century. Yet, despite all this concern over the inabilities of the old “pioneer” schools, the common school remained as the primary tool for educating rural school children throughout much of the United States up until the 1950’s. If variations in funding really did effect the level of education for these children, as suggested by these progressive educators, then the decentralized public school system of the day may very

well have been a relic, a result of poor institutions that allowed local governments to provide too little of a public good. On the other hand, if variation in funding did not cause substantial differences in educational attainment, the common school system must have declined in importance due to other factors, such as state interference or the economies of scale of consolidation. The method considered to answer this question will now be discussed.

The Model:

As mentioned earlier, this study will test three different hypotheses concerning the relationship between school funding and educational attainment. Before discussing these three hypotheses tests in more detail, the first step should be to identify a proxy for school attainment to be used as the dependant variable. To explain, the true measure of human capital achieved by a student by dollar spent on education or by years in school is, unfortunately, not measurable. As a result of this difficulty, any measure of a student's human capital must be approximated by another variable. The standard measure used in the current literature is that of aptitude tests, more specifically, SAT or ACT scores. For the period of 1935 to 1955 these test scores are unavailable and, even if they were, may not be adequate due to selection bias. Instead, three other potential dependant variables will be considered for this test.

First, attendance rates may be a sufficient proxy for human capital accumulation as a result of the cost-benefit analysis made by school children's parents in sending them to school each day. To explain, if the long-term benefit of sending a child to school for

an additional day is greater than the cost of not having that child stay home to work or do some other activity, then that parent will send that child to school. If this decision is indeed made at the margin, a school that provides a larger amount of human capital per day will have greater benefit to children, and, holding all other factors constant, this school will have greater number of days attended by children than a school with lower funding. Attendance, though, may not be a good measure due to the presence of mandatory attendance laws throughout the period; the enforcement of these laws, though, is highly suspect (Lancaster 1952).⁵

The second potential proxy is a dummy variable of whether or not a student moved on to the next grade at the end of a term (or graduated from eighth grade).⁶ If similar standards were used from school to school in deciding grade promotion, this variable will capture whether or not a student acquired the sufficient amount of human capital for a given year. This measure may be problematic due to varying standards in grade promotion. Further, if eighth grade graduation is used, which at this time required the passing of a state exam, a concern of comparability over time is introduced, since, at least in the author's judgment of primary exam records for Morgan County, Illinois, the eighth grade exam became easier over time (particularly, in 1935, nearly one tenth of potential graduates failed the exam, while in 1950, only one student out of nearly two hundred and fifty did not pass).

The last, and potentially the best measure, proxy is grades achieved in core subjects during the first year of high school by student. Common schools, as a rule, did

⁵ Lancaster argues that these laws were not enforced due to the reliance of enforcement on local authorities that were lax in their duties. Lleras-Muney (2002) found that compulsory attendance only increased educational attainment by 5%.

⁶ Whether or not a student moved onto high school is another potential proxy in this same grain.

not contain a high school, and, as a result, high school bound graduates of common schools had to attend the local town high school. Since each township typically contained several common schools, a town elementary school and town high school, students from the several rural common schools would attend the same high school. The grades achieved by these different common school students in high school would then be comparable to each other. This variable will then allow for an approximation of the human capital achieved at common school because the first year (or semester) of high school will be at least partially dependant on the amount of human capital accumulated at common school. High school controls can then be included in order to account for differences that may exist between high schools in grading policies. A potential complication in this measure may be if only one common school sends students to the local town high school; given the large number of common schools present and that the town elementary school will also have graduating eighth graders, this will most likely not be of much concern.

Having discussed the concern over the potential dependant variables, the three hypotheses tests will now be considered. First, local educational expenditure per student will be regressed on the dependant variable to determine if that increased spending per student had an effect on educational attainment. If expenditure per student does matter for a student's education, we would expect expenditure to have a positive and significant coefficient. Next, local educational expenditure per student squared will be regressed on the dependant variable to determine if there existed decreasing educational attainment returns to each dollar spent on education. If this is the case, we would expect local

educational expenditure per student squared to be negative and significant (positive and significant would imply that there are increasing returns to each dollar spent).

Last, the above two tests will be conducted for state educational expenditure per student as well in order to test if state money had the same effect as local money on educational attainment. If state money differs from local money, we would expect the coefficients for local expenditure and state expenditure to differ significantly; the prior is that state money will not be used as efficiently as local money, so we would expect the coefficient for state expenditure to be less than the coefficient for local expenditure.

The above tests will be conducted using panel data, which will include year effects and school (or child) fixed effects in order to account for unobserved variables. Beyond the inclusion of these effects, important control variables will also be included in the test. Particularly, measures of wealth of the school district, average educational levels of the school district, and race and ethnicity variables will be included to account for community differences between school districts. Measures of wealth of the parent's of the children attended, measures of the educational attainment, race and ethnicity variables will be included to account for family backgrounds for each student. Also to be included will be the expenditure on roads by the district. Last, the number of students attending each school, a dummy variable indicating the type of school (common or elementary), and (for regressions that may apply) teacher characteristics will also be included.

The estimated model then will take the following form:

$$DV_{it} = a_i + b_t + LE_{it} + LE_{it}^2 + SE_{it} + SE_{it}^2 + X_{it} + v_{it}$$

where DV is either attendance, graduation rates, or high school grades for period t and for agent i , a is fixed effects for agent i , b is fixed effects for period t , LE is local expenditure

per student for period t and for agent i , SE is state expenditure per student for period t and for agent i , X is control variables (listed above) for period t and agent i , and v is the error term for period t and agent i .

This model, though, will not be able to account for the potential existence of a variable included in the error term that is correlated with both local expenditure and the dependant variable. Specifically, it may be that a community has a high regard for education, causing it to both encourage each student's educational attainment and be more willing to finance its school district more heavily. The above model may not be able to discern between this effect and the effect of local expenditure on the dependant variable. To remedy this endogeneity problem, three potential instrumental variables (variables correlated only with local expenditure and not with any other variable) will be considered.

First, if communities do not elect school boards according to their preferences for education, the characteristics of the school board, such as wealth, occupation, educational attainment, or length of service, will be correlated with local expenditure but not with the error term. Secondary sources that study the problem of school board selection suggest that this may indeed be the case. However, given the size of the sample to be used, maintaining that no school board will be elected based on their preferences for education may be too strong of an assumption.

Second, if taxpayers that have no children within a school district generally desire not to pay taxes to support their school district and have no influence on the children attending school, attributes of these taxpayers would be correlated with local expenditure and not with the error term. Given that common schools are located in rural areas where

distance between families is rather large, the influence of neighbors on the education of children may be zero. However, if there are strong ties within these communities through relation or membership to the same churches, the attributes of neighbors may be correlated with the education of the school children.

The third, and probably most convincing, potential instrumental variable is the local funding decision of the “model” schools. To explain, common schools during this period existed side by side with elementary schools that were typically located in the nearby towns and villages. The school boards of common schools would look at these schools’ financing decisions as a guideline in making their own school’s financing decisions. This relationship would not run the other way, since the elementary school was generally considered as the progressive method of education while the common school was considered backwards. Instead, elementary schools would look to the operation of larger city schools as their “model” school. A distance-weighted measure of “model” school finance would then be an instrumental variable correlated with local expenditure and not the with error term, allowing for the problem of endogeneity to be overcome.

Data:

According to both Missouri and Illinois law, school records were to be kept by county authorities on penalty of receiving a fine. Unfortunately, despite the laws assurance that permanent records of student and school performance were to be on file for public use, in practice this was far from the case. Today, for the states of Missouri

and Illinois, most school records are no longer in existence. However, almost every county does possess some records of its schools, even though these records vary considerably in completeness and legibility.

Given the difficulty in obtaining consistent data for all counties and the enormous amount of time needed to conduct this level of study for all counties, this study will focus only on two or three representative counties in Missouri and two to three representative counties in Illinois. At this time, the author is determining what counties possess the necessary information for this study and whether or not these counties will be representative of the state as a whole. This is being done by comparing expenditures per county on education on that of the state. Efforts are also being made to maintain geographical and cultural similarities between the counties of study.

The period of this study will be that which corresponds with the decline of the common school in Illinois and Missouri, namely 1935 to 1955. From 1930 to 1950, common schools were still a common feature throughout the United States, with Missouri and Illinois being no exception. According to Lancaster (1952), there still remained more than 75,000 common schools existed out of 141,318 schools within the country in 1947; it is important to note that this was after considerable consolidation beginning in the early 1930s. Common schools declined due to consolidation and the adoption of elementary schools as the dominant form of primary education. In Illinois, there existed approximately 12,000 school districts in 1942; by 1952, this number had dropped to approximately 3000. For Missouri, there existed approximately 8,000 schools districts in 1942; by 1952, this number had dropped to 2,000. Average finances per student for Illinois and Missouri were approximately equal to that of the United States average

(Illinois slightly above, Missouri slightly below). Interestingly, Illinois school finance received nearly all of its revenue from local sources (it rated 48 in intergovernmental transfers for this period).⁷ It is of particular importance that the method for allocating this money changed during this time also. For instance, in 1951, the Illinois state government passed a statute that stopped all state funding going to schools with less than 15 students (Illinois Statutes). The existence of such formal laws will allow for a later determination if state intervention was indeed the cause of the decline of common schools.

The empirical method of this study will use micro-level panel data in order to capture common school variation in expenditure within states and over time and then use state variation in expenditure as a method to capture the effect of state funding on education attainment. The most relevant data for conducting this study at the student level are the Teacher's Daily Registers. Teacher's Daily Registers include attendance and grade information for all students attending a particular school, as well as information concerning parents, the teacher and his or her salary, the school board, and the condition of the classroom and school building. The use of these registers overtime will allow for the tracking of student performance, which is needed if grade promotion is to be used as a dependant variable. These registers also exist for high schools, allowing for first year (or semester) grade performance to be obtained for each student.

Unfortunately, no county records thus inspected have included all registers for all schools for the whole period of this study. If registers are to be used as the only source, not all schools will be able to be included for all years and for all counties. Alternative sources do exist that could be used to supplement this missing data and also to reduce the

⁷ At this point, no information has been collected on local variation of school finance at the school level; nevertheless, from the primary records inspected by the author, there seems to be considerable variation at the school level in both Illinois and Missouri.

research time needed to gather the relevant variables. For example, School Classification and Attendance Reports summarize the Teacher's Daily Registers for a particular year and provide detailed information on the teacher; school characteristics, though, are not included. Teacher's Annual Reports and Trustee's Annual Reports also provide yearly summaries of school performance, but lack specific student information. If Teacher's Daily Registers are not consistently available for enough counties, these reports will be used instead with the cost of having to conduct the study at a school level instead of at a student level.

Beyond the above school records, tax records are consistently available for all counties and for all years. From these tax records, measures of wealth (in agricultural and residential land) can be obtained for school districts and individuals and revenue for schools can be measured. For most counties, school expenditure and road expenditure records are available in full form and are, in most cases, audited by state authorities. School expenditure records also provide a break down on how money was spent and also where money was received from (local property taxes, state government, etc.). This information is also available in Trustee's Annual Reports.

For other control variables, the 1940 and 1950 census manuscripts may be used. These manuscripts will offer measures of wealth, occupation, and education for parents of children, and, if given enough time, can be compiled to provide average education and wealth of school districts (this information could be obtained from Census reports for county level, but this would be too broad of a measure). Given the use of names for parents, children, teachers, and school board members for all of the above records except those aggregated over a specific year, matching will be done through use of name.

Census manuscript records, unfortunately, will only be available for two years out of twenty for this study. For educational variables of parents, this will not be of concern given that years of education received by parents will most often be constant for rural individuals. Wealth and income information will not be, though. This information will have to be modified using tax information. It is not clear to the author yet that the benefit of including information from census manuscript records will outweigh the cost in matching, particularly given that each student will have his or her own fixed effect variable that should capture the information that would be included from the manuscripts.

Last, plat records for each county will be used to measure the distance between schools within a particular county. For this study, the relevant measure will be between common schools and elementary schools, but, for the extensions (particularly for consolidation of common schools), it is necessary to find the distance between common schools and neighboring common schools. If plat records do not exist, then title records can be used to locate school grounds, and then current plat records will be used to measure the distance between schools.

Conclusion and Extensions:

The purpose of this study will be to determine if variation in common school finance causes differences in educational attainment and to determine if money spent on richer common schools could have been better spent on poorer common schools via transfers by state governments. This study, though, will only provide a partial

explanation on why common schools persisted as long as they had. To more completely answer this question, additional work is necessary.

First, a relevant question on this subject would be why variation existed in common school finance. This study would ask what factors contributed to the school board decisions to increase or decrease school funding. A related question would be what factors contributed to the decision of the school board to consolidate with other schools. Important for both of these studies would be the influence of state government finance to local schools, particularly given that state governments during this period began to apportion money in ways that supported elementary schools over common schools. The development of country roads may also be a major determinant in consolidation decisions.

Another line of research would be to consider the change in educational attainment resulting from the consolidation of common schools into either larger common schools or elementary schools. Given that the period is precisely the time when common schools underwent the most amount of consolidation, determining if economies of scale were achieved by consolidation would be a logical extension of this study. Again, the influence of state governments should be considered in such a study given the change of state policy towards encouraging consolidation.

Outside of the question over the decline of common schools, the data source collected could also be used to test the Tiebout hypothesis (“voting with feet” over whether or not to support a local public good).⁸ To explain, if Teacher’s Daily Registers are used as the main data source for this study, information on the movement of school

⁸ See Konishi (1996) for a theoretical model using Tiebout and local elections for the provision of public goods.

children from one district to another would be included. If the movement of these children is correlated with either the general quality of schools or the amount of local taxation, this would be evidence that individuals do select local public goods outside of just their participation in the political process.

Overall, this study hopes to be the first of several works concerned with the provision and decline of common school educations in the Midwest. In order for this study to be successful, the data source must be rich enough to capture enough variation in school quality while being able to provide strong enough instruments and controls to accurately measure the influence of expenditure on school performance. At this point, the author believes that this is indeed possible, and that the historical contribution of this work warrants the effort necessary to make these data available.

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