# Finding the Fat: The Relative Impact of Budget Fluctuations on African-American Schools

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**Abstract**

On average, per pupil expenditures were much lower in schools attended by African-American children than in schools attended by whites during the period of de jure segregation. Little is known, however, about what motivated school boards to maintain this inequality or why they funded African-American schools at all. Using newly collected data on schools in early twentieth-century Georgia and exploiting a funding discontinuity resulting from the rules regarding appropriations from the State School Fund, this paper examines how school boards divvied up the proceeds of exogenous shifts in school budgets by race. In response to a one dollar per pupil budget cut, instructional expenditures in white schools fell by $1.43 per pupil, while they remained unchanged in African-American schools. Thus, whites, rather than African Americans, bore the brunt of budget cuts, indicating that there was little fat to trim from the budgets of African-American schools. This suggests that school boards were motivated to finance African-American schools by a need to maintain token compliance with "separate but equal."

## 1 Introduction

The 1896 Supreme Court ruling on *Plessy v. Ferguson* constitutionally sanctioned the segregation of schools by race, as long as the schools provided were "equal." Yet it is well known, despite the prevailing doctrine of "separate but equal," that African-American schools in the South were substantially inferior in measured school quality to white schools during the early twentieth century (see, for example, Collins and Margo 2006; Margo 1990). "White children in publicly supported school buses are taken to fine consolidated schools," observed Gunnar Myrdal, "while often Negro children are given only what amounts to a sham education in dilapidated one-room schools" (1944, 894). The racial gap in school quality and expenditures is suggestive evidence of the bias of school boards in supporting white schools.

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While it has been shown that school boards spent less per pupil on average in the African-American schools than in the white schools, little is known about how these school boards reacted to changes in their budgetary environment. To further illuminate how school boards made funding decisions with regard to race in the early twentieth-century American South, this paper considers the following questions: When faced with budget cuts, or surpluses, how were funds reallocated? And in particular, in times of budget distress, did school boards cannibalize the quality of African-American schools to prop up white schools? Or, was there simply no fat to be found in African-American school budgets?

Given that the Southern electorate was predominately white, due to suffrage restrictions aimed at limiting the political participation of African Americans, it might be expected that budget cuts would be met disproportionately with reductions in expenditures on schooling for African Americans. However, such a finding would run counter to the view that African-American schools were already kept at some minimally acceptable level of quality. As Margo (1991) points out, school boards had an incentive to spend as little as possible on the education of African Americans. The lower bound, he suggests, was perhaps determined by a desire to avoid legal action or the need to maintain a local labor supply. If this was the case, then expenditures on African-American schools should be relatively unaffected by county-level budget shocks.

Relatedly, the answers to the above questions will shed light on the contributing factors to Myrdal's paradox. Put simply, Myrdal (1944) wondered why white dominated school boards funded African-American schools at all. A number of explanations have been proposed, including altruistic behavior on the part of school boards, the existence of positive externalities from educating African Americans, the need to maintain a local labor supply, and legal restrictions. While there is anecdotal evidence to support each of these motivations, they have not been empirically tested. If altruism or positive externalities, or both, played a role in the decision making of county school boards, then expenditures on African-American schools would be increasing in revenues. Thus, by considering how school boards responded to exogenous changes in their budgetary environment, I am able to test for altruism and positive externalities as motivations for maintaining African-American schools.

I exploit a funding discontinuity resulting from the rules regarding the apportionment of the School Fund for the state of Georgia to examine how school boards spent funds from an unconditional grant at the margin. State law required that the School Fund be distributed from the treasury to the counties in proportion to the school-age population. However, the official figures for the school-age population were infrequently updated; Georgia conducted a census of the school-age population every five years by law beginning in 1888. Thus, apportionments from the State School Fund changed discretely at five-year intervals. My identification strategy takes a regression discontinuity approach since the actual school-age population likely changes only slightly from year to year but the official school-age population may show large changes in adjustment years.

I first examine the impact of budget shocks on overall expenditures at the county level. The results reveal that changes in state appropriations caused approximately dollar-for-dollar changes in total expenditures, providing historical evidence of a "flypaper effect." Additionally, instructional expenditures were the most sensitive to funding discontinuities, which is not surprising as they accounted for more than half of county school board expenditures in early twentieth-century Georgia. I then test for differential changes in expenditures by race in response to budget shocks, finding that whites, rather than African Americans, bore the brunt of budget cuts. In response to a one dollar decrease in appropriations per pupil, instructional expenditures per white pupil fell by $1.43, while instructional expenditures per African-American pupil remained nearly unchanged around the 1913 school census. This suggests that there was little fat, if any, to trim from the budgets of African-American schools. Moreover, it appears that local spending on African-American schools was motivated by the need to maintain token compliance with "separate but equal," or possibly the desire to attract and retain a local labor supply, rather than by altruism or positive externalities.

## 2 Review of the Literature

Much of the literature on racial discrimination in early twentieth-century school finance has focused on the division of school revenues between the two races. Indeed, local taxation was a topic of heated debate during the period. A major objection of white taxpayers to local taxation for education was that their tax dollars would go to support black schools. Wealthy and middle-class whites owned the majority of taxable property and, thus, believed they would receive few benefits from local school taxes but would bear most of the cost (Margo 1990).

Scholars have attempted to quantify the degree to which white taxpayers were subsidizing African-American schools, if at all. Kousser (1980) calculates the subsidy to African-American schools in North Carolina as the African-American share of school expenditures less the African-American share of school taxes. He finds that prior to disfranchisement African-American schools were heavily subsidized by white taxpayers, but by 1910 whites were just barely subsidizing African-American schools. However, Pritchett (1989) argues that the legal tax incidence underestimates the true tax burden of African Americans, and he instead calculates the economic incidence of property tax by race in North Carolina. He finds that if at least 30 percent of property tax was shifted onto workers, which he argues was quite plausible, then the tax burden of African Americans would have exceeded expenditures on African-American schools. Thus, the debate remains unresolved.

Another strand of the literature has empirically demonstrated an observation made by Bond (1934) that in heavily African-American areas whites diverted funds appropriated for African-American schools. Using cross-sectional data, Kousser (1980) and Margo (1982) show that expenditures on white schools were

increasing in the African-American share of the school-age population in North Carolina and Louisiana, respectively, during disfranchisement. The implication being that funds allocated by the state to African-American schools were redirected at the local level to white schools. Since state school funds were allocated on the basis of school-age population, a larger African-American share meant a larger pool of funds that could be diverted to white schools.

However, the positive relationship between African-American share of the school-age population and white school expenditures is merely suggestive of racial bias on the part of school administrators. It is certainly possible that such distributions of revenue were optimal. In fact, economies of scale in education would generate such a relationship. For example, to educate a small, dispersed population of African Americans, a county would have to provide many schools, each with a small enrollment. Yet the same number of schools could accommodate a much larger African-American population at little additional cost.

In a recent addition to the literature, Carruthers and Wanamaker (2013) analyze the impact of private donations to African-American schools from the Rosenwald Fund on school expenditures by race, using a county-level panel of data covering five Southern states. They show that each $1 donation from the Rosenwald Fund led to an $0.87 increase in expenditures on African-American schools and a $1.34 increase in expenditures on white schools. Since Rosenwald donations were required to be matched locally, in which case we would expect expenditures on African-American schools to increase by $2 for every Rosenwald dollar, the results reveal that private donations crowded out public school expenditures on African-American schools. Moreover, funds donated were diverted to white schools.

While Carruthers and Wanamaker (2013) clearly demonstrate that private donations crowded out local government spending, the extent of diversion is limited by the conditions of receiving Rosenwald funds. It would not have been possible to accept a donation from the Rosenwald Fund without building a new school for African Americans. In this work, I examine how funds from an unconditional grant are spent at the margin. This allows for a clear assessment of the extent of racial bias in school finance and the motivations of school board members.

## 3 Background on School Finance in Georgia and the South

Three characteristics of school law in Georgia provide the conditions necessary for substantial funding discontinuities, which I use to examine the impact of budget shocks on expenditures. First, in contrast to early school finance in most of the United States, revenues for education in Georgia were primarily raised at the state level. Second, the State School Fund was distributed to the counties based on the share of their school-age population in relation to that of the state as a whole. Third, the reported school-age population was updated infrequently, only every five years. None of these characteristics alone were uncommon in the

South, as will be shown, but together they produced significant shocks to county school revenues in adjustment years—that is, in the calendar year directly following a school census—, making Georgia somewhat unique.

### 3.1 State versus Local School Finance

Not until after the Civil War was the idea of free schooling for all children widely adopted in the South. The Reconstruction governments, which were dominated by northerners and northern sympathizers, guaranteed in the new state constitutions and laws free access to public schooling. In Georgia, the Constitution of 1868 first mandated the creation of a state-wide public school system. To finance this endeavor, the constitution required that the proceeds of several state taxes be set aside to constitute a State School Fund. These included the poll tax, a tax on shows and exhibitions, and a tax on the sale of spirits. More importantly, the General Assembly was given the power to levy additional taxes on property as necessary, yet there was no mention of local taxation.[1] Thus, from inception the public schools of Georgia were intended to be centrally funded by the state, rather than by municipalities.

As prescribed by the Georgia Constitution of 1868, the General Assembly passed legislation in 1870 providing for a state-wide system of public schools. The following year 1,352 schools for whites and 221 schools for African Americans, together enrolling 70,035 students, were put into operation. The monies accruing to the State School Fund over the three years preceding amounted to approximately $400,000, enough to keep schools in operation for three months, as mandated by law. Unfortunately, it was discovered that much of the State School Fund had been misappropriated by the General Assembly and replaced with bonds that were illiquid (Georgia Department of Education 1871).[2] The General Assembly initially responded to this fiscal crisis by passing legislation in January, 1872, allowing counties to fully finance schooling themselves through local taxation.[3] However, their actions came too late to save the 1872 school year; unable to pay the $300,000 Georgia owed its teachers, the public schools were closed for a year, in order to replenish the State School Fund (Georgia Department of Education 1872). In the end, this legislation was short lived, being repealed in August of the same year as part of a complete rewrite of school law in Georgia, which again favored a centralized approach to school finance.[4]

[1] See the *Georgia Constitution of 1868*, Article 6, Secs. 1 and 3.

[2] The details of this case are well described in a letter published at the end of the *First Annual Report of the State School Commissioner of the State of Georgia*, which can be viewed at http://dlg.galileo.usg.edu/ggpd/docs/1871/ga/e300/_pa1/1871.con/1.pdf#page=91.

[3] *An Act to amend an Act entitled "an Act to establish a system of Public Instruction," approved October 13th, 1870, and for other purposes*, GA No. 252, Sec. 16, January 19, 1872, in *Acts and Resolutions of the General Assembly of the State of Georgia, at a Session in November and December, 1871; Comprising, also, the Acts and Resolutions Passed at the Session of January, 1872*, p. 282.

[4] *An act to perfect the Public School System and to supersede existing school laws*, GA No. 71, Secs. 17 and 35, August 23, 1872, in *Acts and Resolutions of the General Assembly of the State of Georgia, Passed at its Session in July*

Immediately following the end of Reconstruction, Georgia adopted a new constitution that seemingly favored more local autonomy in the financing of education. However, the exact wording of the Georgia Constitution of 1877 made it all but impossible to raise local taxes in support of education in any school district.[5] While local taxation was not prohibited, the new constitution required that the power of local school authorities to levy taxes be "approved by a two-thirds vote of *persons qualified to vote*."[6] This bar proved too high for any county.[7] Indeed, the author, Robert Toombs, proudly boasted after the constitutional convention that he had "locked the door of the treasury and thrown away the key" (quoted in Northen 1911, 3). Not until a constitutional amendment approved in 1904 did local taxation become a realistic option. The amendment changed the wording to require only the approval by "two-thirds majority of *persons voting*."[8] While the difference in wording is subtle, the effect was significant. The importance of local taxation increased rapidly after 1905 as more and more counties and school districts voted in favor of funding education locally. Figure 1 shows the sources of all school revenues from 1902 to 1922. The dramatic increase in the contribution of local taxation is clear, making up 18.5 percent of revenues in 1902 and 44 percent by 1922. Still, in 1922, appropriations from the State School Fund remained an important part of school finance, making up over a quarter of all receipts. Indeed, Figure 2 shows that per pupil disbursements form the State School Fund doubled in real terms over the same period.

While most other southern states also established public school systems in the later half of the nineteenth century, there was not a consensus among them over how schools should be financed, as shown in Table 1. Alabama, like Georgia, favored a centralized approach to school finance, establishing a state school fund and greatly limiting the potential role of local taxation. Legislation required three-fifths of those voting to approve local taxation, with the tax rate not to exceed one mill. By contrast, South Carolina followed a decentralized plan, mandating that each county levy a three mill tax on property to support its schools. Tennessee, favored a mixed approach, with some funds provided by the state and the remainder necessary to run schools for the minimum term length being collected by local taxation. Yet, in every Southern state, at least some educational funds were provided by the state government.

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*and August, 1870*, Part 1, Title 18, p. 69.

[5]As the new constitution contained a grandfather clause for schools in localities governed by special legislation, the counties of Bibb, Richmond, Glynn, and Chatham, as well as several city school systems, could still raise local taxes for schools under special laws passed prior to 1877.

[6]See the *Georgia Constitution of 1877*, Article 8, Sec. 4.

[7]The fact that, prior to 1908, many African-American men over 21 years of age were legally eligible to vote but were de facto disfranchised may have prevented counties from meeting this requirement.

[8]*Local Taxation for Public Schools*, GA No. 471, Sec. 1, August 17, 1903, in *Acts and Resolutions of the General Assembly of the State of Georgia 1903*, Part 1, Title 3, p. 23.

### 3.2 Apportionment of State Funds and the School Census

Throughout the late nineteenth and early twentieth centuries the distribution of Georgia's State School Fund to the counties followed a quite simple and seemingly equitable rule. Disbursements from the School Fund were "based upon the proportion which the school population in each county bears to the school population in the State as shown by the last school census."[9] This was the most common method of disbursement in the United States, as 36 other states had similar apportionment rules (Neystrom 1910). In the South, the notable exceptions were South Carolina, which disbursed its school funds on the basis of enrollment, and Florida, which apportioned funds on the basis of average attendance.

Using the school-age population as the basis of apportionment initially made sense in Georgia as it conducted an annual enumeration (or, at least, it was legally required to do so). However, this changed in the late nineteenth century as the General Assembly ordered, "the enumeration of the children between six and eighteen years taken under instructions from the State School Commissioner, in the year 1888, and every ten years thereafter." Also, a census could optionally be ordered "in the year 1893, and every ten years thereafter," at the discretion of the State Board of Education.[10] The result of this law was a school census every five years from 1888 until 1948.[11] This made Georgia fairly unique in that only five other states took school censuses less frequently than biennially, with the majority conducting an annual enumeration. In the South, Florida took a school census decennially, Virginia quinquennially, Louisiana and Mississippi quadrennially, Alabama biennially, and the remainder annually, except for South Carolina and Maryland which did not take a school census (Neystrom 1910).[12] In combination with the large contribution of Georgia's State School Fund to local education revenues, it becomes clear how the infrequent enumeration of the school-age population created the potential for significant shocks to school revenues at the county level in adjustment

[9] *To Systematize the Finances and Increase the Efficiency of the Common Schools*, GA No. 137, Sec. 2, December 13, 1894, in *Acts and Resolutions of the General Assembly of the State of Georgia 1894*, Part 1, Title 6, p. 60.

[10] *An Act to provide a more correct and efficient mode of taking the enumeration of the school population and to supersede existing laws upon that subject*, GA No. 420, Secs. 1 and 2, September 28, 1883, in *Acts and Resolutions of the General Assembly of the State of Georgia 1882-3*, Part 1, Title 6, p. 84.

[11] While Georgia continued to take a census of the school-age population into the mid-twentieth century, it moved away from distributing funds on this basis starting in the mid-1920s. Beginning in 1926, an equalization fund was administered by the Department of Education "for the purpose of more nearly equalizing the educational opportunities." These funds were distributed in addition to funds apportioned according to the school-age population. By 1938, Georgia had completely abandoned the practice of distributing school funds in proportion to the school-age population. See *Extra Appropriation to Common School Fund*, GA No. 2, Sec. 1, March 13, 1926; and *Equalizing Opportunities*, GA No. 33, February 10, 1937.

[12] Given the infrequent school censuses in Florida, Virginia, Louisiana, and Mississippi, these states were also considered as candidates for this analysis. Recall that Florida did not use the school-age population as the basis of apportionment, so census updates would not have generated budget shocks. Unfortunately, the Department of Education reports for Mississippi do not include any information on expenditures by race. The corresponding reports for Virginia and Louisiana provide only expenditures on teachers by race, permitting a limited analysis. While an examination of Virginia and Louisiana may be instructive, Georgia provides the richest possible source of data for this project.

years.

### 3.3 Local Distribution of School Board Receipts

At the state level, this system of distribution seems quite egalitarian, and it was certainly in compliance with the Fourteenth Amendment. However, it is important to note that there was little legislation regarding how funds were to be distributed by county school boards. In Georgia, the law was silent on how the County Board of Education should distribute revenues to sub-districts. Indeed, the Georgia Attorney General opined that it was the policy of the legislature to bestow "the several Boards of Education in this State with almost supreme power in the administration of the public school fund" (Georgia Department of Education 1912b, 81). With regard to the distribution of funds by race, the law required that the County Board of Education "shall, as far as practicable, provide the same facilities for both races in respect of attainments and abilities of teachers and length of term-time."[13] Unfortunately, the phrase "as far as practicable" gave county boards some degree of discretion. It is clear from Table 2 that, in practice, county boards did not provide the same facilities to both races. Instructional expenditures per pupil for African-American schools consistently amounted to approximately one-quarter of instructional expenditures per pupil on white schools, on average, over the period 1912 to 1922. Given the substantial racial differential in enrollment rates, this likely underestimates the degree of inequality. No doubt this arrangement was convenient since the state could claim perfect compliance with separate but equal, while the counties could follow a policy of separate and unequal.

Since the law provided little guidance on how funds should be distributed at the county level, it then becomes important to understand the motivations of the members of the County Boards of Education. If school board members were popularly elected, then they would be considered to represent the values of the median voter. However, the members of the County Board of Education were not held accountable to the voters of Georgia. Rather, each County Board of Education was composed of five residents selected by a grand jury to serve a four year term.[14] The grand juries, in turn, were composed of between 18 and 23 jurors selected from a list of "the most experienced, intelligent and upright men," containing not more than two-fifths of eligible voters. This list was made by jury commissioners, who themselves were appointed by the Superior Court Judge.[15] Therefore, the members of the County Boards of Education were representatives of the local elite, almost certainly upper-class, white men.[16]

[13] *Revising, Amending and Consolidating the Common School Laws*, GA No. 587, Sec. 21, October 27, 1887, in *Acts and Resolutions of the General Assembly of the State of Georgia 1886-7*, Volume 2, Part 1, Title 8, p. 74.

[14] *Revising, Amending and Consolidating the Common School Laws*, GA No. 587, Sec. 16, October 27, 1887, in *Acts and Resolutions of the General Assembly of the State of Georgia 1886-7*, Volume 2, Part 1, Title 8, p. 71.

[15] *Georgia Code of 1895*, Article 7, Secs. 812, 813, and 818.

[16] The Annual Report of the Department of Education for 1914 listed the names and residences of all 946 county school board members in Georgia in that year. Linking these individuals to the 1910 Census, using the index available at familysearch.org, results in 534 unique matches on first initial, middle initial, surname, and county of residence (a

## 4 Why did School Boards fund African-American Schools?

Given that the County Boards of Education represented the interests of local white elites, they had political incentive to spend as little as possible on African American schools (Margo 1982, 1990). This is well illustrated by the superintendent of Newton County, who in his annual report to the grand jury claimed:

> The average salary paid our negro teachers is $12.08 per month, or a little more than half the average salary paid negro teachers in the whole State.... Only three other counties in the State pay as low salaries to the negro teachers as do our board of education.... Only one negro school in the county ran for the full term of five months, and not a single one received a cent for added time taught. The average term for the negro schools of the county is 75 days, or nearly exactly three-fifths of the term for the white children. So far as I am able to learn no county in the State shows such a record in favor of her white boys and girls. (Georgia Department of Education 1907, 125-127)

To which the grand jury responded by praising the superintendent's efficiency and "interest manifested in the cause of education" (Georgia Department of Education 1907, 128).

If this was the prevailing sentiment, why then did they expend any funds at all on the education of African Americans? The conundrum expressed by this question has become known as Myrdal's paradox, named for the economist and Nobel laureate Gunnar Myrdal, who noted: "The great wonder is that the principle of the Negroes' right to public education was not renounced altogether. But it did not happen" (1944, 888). Scholars, guided by anecdotal evidence and economic theory, have provided a number of plausible answers to this question.

First, Myrdal proposed that access to education was core to the "American Creed," that all deserved equality of opportunity. "Education," Myrdal observes of American values, "has always been the great hope for both individual and society" (1944, 882). It was this belief, he argued, that prevented public education for African Americans from succumbing in the South. Thus, the suggestion is that belief in this "American Creed" led county school boards to altruistically provide funds for African-American public schools.

A second answer suggests that the education of African Americans yielded positive externalities to local whites. Some whites argued for the education of African Americans as it increased their labor productivity and obedience, which benefited the white population (Myrdal 1944). Along these lines, Georgia State Superintendent G. R. Glenn stated: "We would better spend thousands of dollars for his education to change the name and the character of his crime, if it does nothing more, than to have one single white woman suffer the ignominy and the nameless disgrace of the beastly lust of one ignorant black brute" (Georgia Department of

56.4 percent match rate). Of these matches only 4, or 0.75 percent, are recorded as non-white.

Education 1901, 27). Lending some credibility to this argument, recent work by Katherine Eriksson (2012) shows that the exposure of African-American children to school in the early twentieth century reduced their probability of incarceration later in life.

Margo (1991) provides another answer to Myrdal's paradox utilizing the Tiebout hypothesis. While disenfranchisement excluded African Americans from political participation, they could still vote with their feet. Using a model of local government discrimination, Margo shows that in equilibrium some amount of education would be provided to African Americans because of the need to maintain a labor supply.

Finally, school boards were likely constrained by the threat of legal action. While the law gave local officials discretion in dividing the school funds by race, a complete elimination of funding for African-American schools would not have been tolerated, as shown in Appendix B. Avoiding litigation would require African-American schools to be funded to, at least, some minimally acceptable level.

According to economic theory and empirical evidence the first two motivations would suggest that expenditures on African-American schools are increasing in school revenues (Kingma 1989). However, the latter two motivations would suggest that expenditures on African-American schools are income inelastic, because there is no marginal gain to increasing expenditures above that necessary to provide some minimally acceptable (or equilibrium) level of school quality. Thus, the proposed analysis will shed light on whether altruism and positive externalities had a significant impact on the decisions of the County Boards of Education. If expenditures on African-American schools fell in the face of budget cuts, it would suggest that altruism or positive externalities are part of the answer to Myrdal's paradox. Yet, if expenditures on African-American schools were constant during times of budget distress, this would suggest that African-American school were being kept at some minimally acceptable level and altruism and positive externalities did not enter the calculations of school boards.

## 5 Data

In the early twentieth century, the departments of education of most Southern states annually, or biennially, issued reports on the status of schools. These reports provide a rich source of statistics on the quality and quantity of schooling at the local level, often by race and sex. This study focuses on the case of Georgia in order to take advantage of the funding discontinuity created by the infrequent taking of the school census. Fortunately, Georgia was among the best at consistently providing detailed statistics by race in its annual reports.

The *Annual Report of the Department of Education to the General Assembly of the State of Georgia* provides race-specific county-level data on expenditures by type (including expenditures on teachers, buildings, and supplies), average monthly salary paid to teachers, number of teachers, enrollment, and the school-age

population. The reports also provide county-level data on the apportionment of the State School Fund and school board receipts by type (including receipts from the state, local taxation, and tuition). I have collected these data for all counties for the years 1909 to 1924, surrounding the 1913, 1918, and 1923 school censuses.[17]

Table 3 presents summary statistics for school revenues and expenditures for 1912, 1917, and 1922, the years prior to school censuses of interest.[18] For each year, statistics are reported separately by whether the counties would gain or lose state appropriations due to the proximate updating of the school-age population. For example, a county is included in the "losers" sample in 1912 if its appropriation from the State School Fund in 1914 was less than its appropriation in 1912, in absolute terms. This divides the sample into roughly equal groups in 1912. However, a majority of counties gained funds following the 1918 school census, and a majority lost funds following the 1923 school census. The two groups are comparable in size, or enrollment, in all years, but the "losers" have a statistically higher enrollment rate on average in 1922. Additionally, relative to "gainers," appropriations and state receipts per pupil are greater on average for those counties that lost state funds as a result of the census update. Since the school census has an equalizing effect on appropriations per pupil, this difference is expected as the "losers" were over-funded with respect to their actual school-age populations in the year prior to the school census.[19] Other differences in receipts and disbursements across groups are small and not statistically significant.

## 6 Estimation

A standard analysis to determine how the marginal dollar of education revenue was spent would exploit longitudinal changes in county school board receipts to estimate the effect of a change in receipts on various

[17] Data for the years surrounding the school census of 1908 is currently being collected. Unfortunately, data on expenditures were not separated by race prior to 1906. Additionally, beginning in 1926, the Georgia Department of Education published a biennial report, making a similar analysis around the school census of 1928 impossible.

[18] The number of counties in the sample changes over time because several new counties were created from parts of existing ones in Georgia in the early twentieth century. And counties with border changes during the relevant time period were dropped from the regressions.

[19] Notice that appropriations per pupil differ from state receipts per pupil. In 1912 state receipts per pupil are slightly below appropriations per pupil. This is likely due to the fact that appropriations were paid by the State Treasury to the County Board of Education on a reimbursement basis, with any unused funds carrying over to the next year. The difference, however, is small as State Attorney General John C. Hart warned against taking advantage of this as a savings device. He argued, "using money appropriated for one year for another, would run counter to the legislative scheme and would be an abuse of discretion" (Georgia Department of Education 1912b, 81). In 1922, state receipts are slightly greater than appropriations on average because, in addition to the foundation grant that appropriations represent, the state also disbursed $100,000 to incentivize four-year high schools and school consolidation (Georgia Department of Education 1923, 465).

local school expenditures. The following ordinary least squares specification illustrates this approach:

$$\Delta Teacher\ Exp\ PP_c = \alpha + \beta \Delta Receipts\ PP_c + \varepsilon_c \quad (1)$$

where $\Delta TeacherExpPP_c$ is the change in per pupil expenditures on teachers and $\Delta ReceiptsPP_c$ the change in per pupil receipts in county $c$ over a given period of time. The problem with this approach is that changes in receipts and expenditures are likely correlated with concurrent shifts in the demand for education (for example, the actual school-age population). Thus, the endogeneity of receipts would lead Equation 1 to yield biased estimates.

Instead, my identification strategy relies on the laws regarding the allocation of the State School Fund to the counties. In early twentieth-century Georgia, the apportionment of the State School Fund was entirely dependent on quinquennial census data on the school-age population. While the amount of education revenue raised locally varied annually and in a contemporaneous fashion with population changes, the official school-age population figures jumped discretely. This caused appropriations from the State School Fund to change discretely every five years. Additionally, there was approximately a one year delay in incorporating the new school census data into the apportionment formula.[20] Thus, adjustments in state funds were not a function of contemporary changes in population but of prior population change. Because of the infrequent update of the school-age population figures used to apportion the State School Fund, the above endogeneity problem can be addressed by considering changes in revenue and expenditures surrounding census years.

The appropriation for county $c$ from the State School Fund ($State$) in a given year $t$ can be written as a function of latest school-age population figures:

$$Appropriation_{ct} = State_t * \frac{Population_{cs}}{State\ Population_s}, \quad (2)$$

where $s$ is the year in which the last school census was taken.[21] The school-age population of county $c$ is given by $Population_{cs}$ and the total school-age population of the state is given by $State\ Population_s$, as reported by the school census taken in year $s$. Therefore, the change in appropriations for county $c$ from

[20] Apportionments for the next school year were decided in January of each year. The school census was taken in April/May in census years. Thus, for example, the 1913 school census, taken in Spring, 1913, was first used in January, 1914, to set apportionments for the 1914 school year.

[21] The relevant school census year, $s$, is a piecewise function of $t$, which can be expressed as $s(t) = 3 + (5 \times \lfloor \frac{t-4}{5} \rfloor)$, where $\lfloor x \rfloor$ gives the floor of $x$.

1912 to 1914, for example, is written as follows:

$$\Delta Approp_c = Appropriation_{c,1914} - Appropriation_{c,1912}$$
$$= State_{1914} * \frac{Population_{c,1913}}{State\ Population_{1913}} - State_{1912} * \frac{Population_{c,1908}}{State\ Population_{1908}}. \quad (3)$$

Each school census had a substantial impact on the distribution of the State School Fund to the counties. County-level changes in state appropriations surrounding the school census years of 1913, 1918, and 1923 are displayed in Figure 3. There is significant variation in the extent to which counties gain and lose funds as a result of school census updates, driven by differences in relative population growth rates during the preceding five years.[22] For example, after the 1913 census, the appropriation for one county fell by 20.8 percent, while the appropriation for another increased by 36.3 percent. The standard deviation in the percent change in appropriations around 1913 is 9.33 percent, around 1918 is 10.47 percent, and around 1923 is 10.18 percent.

For comparability across counties, I analyze changes in state appropriations per pupil (that is, per enrolled student). The change in appropriations per pupil from 1912 to 1914 is expressed as follows:

$$\Delta Approp\ PP_c = \frac{Appropriation_{c,1914}}{Enrollment_{c,1914}} - \frac{Appropriation_{c,1912}}{Enrollment_{c,1912}}. \quad (4)$$

Table 4 shows the county-level distribution of the change in appropriations per pupil surrounding school census years. From 1912 to 1914, state appropriations per pupil fell by 51 cents on average, which is likely driven by increasing enrollment.[23] Due to a significant increase in total disbursements from the State School Fund between 1917 and 1919, nearly every county experienced an increase in appropriations, with a mean and median increase of $1.15. The mean and median change in state appropriations per pupil from 1922 to 1924 was close to zero. The changes in the tails, however, were substantial surrounding each of the census years. Those counties that gain or lose state funding in adjustment years provide exogenous variation school funds.

As described above, the State School Fund was distributed in the form of flat grants, or foundation grants, to the counties on a per school-age child basis without regard to race, or any other characteristics.

[22]County-level growth rates of the school-age population would have been primarily determined by fertility and migration. Calculating the relative contribution of these two factors using the school census data is not possible, because age was not recorded. However, using the estimated life tables for 1910 (Haines 1998) and the Life Table Survival Ratio method (United Nations 1970), I calculated the net intercensal migration rate at the county level of the 0 to 5 year old population of Georgia in 1910. Comparing the predicted and actual 10 to 15 year old population in 1920 reveals that on average migration accounts for 42 percent of observed population change for that age group between 1910 and 1920.

[23]The total amount of school funds disbursed annually by the state remained unchanged at $2,550,000 from 1912 to 1914 (Georgia Department of Education 1915, 507).

The County Board of Education was instructed to distribute these funds to the schools or sub-districts "as may be for the best interests of the district and county as a whole" (Georgia Department of Education 1912b, 77). To examine how school funds were actually allocated at the margin, I assess the impact of the exogenous change in appropriations per pupil on a variety of school board expenditures: total expenditures, expenditures on teachers, support expenditures (administration), and capital expenditures (building and repairs). Equation 5 shows the regression specification for the effect of changes in per pupil appropriations ($\Delta Approp\ PP$) on changes in per pupil expenditures on teachers ($\Delta Teacher\ Exp\ PP$):

$$\Delta Teacher\ Exp\ PP_c = \alpha + \beta \Delta Approp\ PP_c + \eta \Delta X_c + \varepsilon_c \quad (5)$$

where $c$ indexes the county and $\Delta X$ is a vector of county specific controls, described below. The specification remains the same for other dependent variables. Rather than pooling the data, I run a separate set of regressions for each census year. By using a first-differences estimation strategy, I am controlling for time invariant county-level characteristics.

One concern with the first-differences framework is that differencing does not control for contemporaneous county-specific trends that might impact expenditures, but are unrelated to the impact of changes in appropriations. As I have shown, the use of local tax revenues to support schooling was rapidly expanding during the early twentieth century in Georgia. If local tax revenues were positively correlated with population growth rates, then the estimates of the impact of population driven changes in state appropriations on school expenditures might be upward biased. To address this concern, I include as a control the lagged, three-year change in local tax revenues per pupil ($\Delta Local\ Tax\ PP$). I also include the lagged, five-year change in enrollment ($\Delta Enrollment$) and change in the share of the school-age population that is African American ($\Delta Percent\ Black$).

While the county school boards were also instructed to "provide the same facilities" for the education of both African Americans and whites, as noted above, large gaps in school quality and expenditures persisted across race. However, it is unclear how school boards reacted to budget shocks. Therefore, I further analyze differential effects of changes in appropriations on expenditures across race. In this analysis, I focus on expenditures on teachers and capital expenditures, as these are available for both races. I, therefore, modify equation (5) to analyze the impact of appropriations on expenditures for each race separately,

$$\Delta Teacher\ Exp\ PP_{c,r} = \alpha + \beta \Delta Approp\ PP_c + \gamma \Delta X_{c,r} + \varepsilon_{c,r} \quad (6)$$

where $r$ indexes race. Rather than controlling for the lagged trend in total enrollment, the lagged, five-year changes in both own race enrollment and other race enrollment are included as controls.

## 7 Results

Using this framework, I examine responses to budget shocks around school census years. I focus primarily on the effects of two-year changes in appropriations around the school census of 1913, from the year before the census (1912) to the year after (1914), on various school receipts and expenditures.[24] The 1913 school census is a particularly nice period to analyze budget shocks because disbursements from the State School Fund remained at $2,550,000 from 1912 to 1915 (Georgia Department of Education 1916). Therefore, an increase in county-level appropriations in 1914 reflects only a relative increase in school-age population, rather than a secular increase in the size of the State School Fund. This results in similarly sized groups of counties gaining and losing funds.

To verify that changes in state appropriations were realized as shocks to county school budgets, I first estimate the relationship between appropriations and various school revenues. The results are shown in Table 5. The coefficient on appropriations in column (1) suggests that total school board receipts per pupil increased by $1.33 in response to a one dollar per pupil increase in appropriations. While the coefficient is greater than one, it is not statistically different from one even at the 10 percent confidence level. Not surprisingly, receipts from the state increased approximately one-to-one with appropriations, as shown in column (2). This suggests that the funds appropriated for each county were in fact transfered to the school boards. Columns (3) and (4) show that changes in appropriations had little to no impact on school revenues from local taxation and tuition, suggesting that school boards were not using these devices as a way to smooth their budgets, at least in the short run. Most importantly, I find no evidence that school boards ameliorated state budget cuts by increasing local taxation. Together, these estimates confirm that changes in state appropriations were felt as real shocks to the size of county school budgets. This suggests a classic "flypaper effect" (Hines and Thaler 1995; Fisher and Papke 2000).[25] However, given that the County Board of Education in Georgia was quite insulated from the demands of the median voter, this is perhaps not as surprising as modern evidence.

[24] Examining one-year changes in expenditures would be ideal from the standpoint of assuming no population change, but the timing of the release of census figures makes this less informative. Take for example the school census of 1913. The new census figures became known in May of 1913, allowing county school boards to predict their state appropriation for the 1914 school year. They likely used the 1913 school year to smooth their expenditures. Thus, comparing 1913 to 1914 would bias estimates of the effect of budget shocks toward zero. I consider two-year changes in order to avoid such bias.

[25] The term flypaper effect refers to the empirical observation that the marginal propensity to spend income from a lump-sum grant on the targeted service (education in this case) is greater than the marginal propensity to spend income from other sources on that service. This has been described as an anomaly because theory predicts that a lump-sum grant will be spent just like any other income, with only a fraction spent on the targeted service and the remainder spent on tax reduction or other services (Gordon 2004).

### 7.1 The Effect of Budget Shocks on School Expenditures

Table 6 presents estimates of the effects of changes in appropriations per pupil on various school expenditures. The effect of changes in state appropriations on total expenditures is positive, as shown in column (1). A one dollar increase in state appropriations per pupil caused an increase in total school expenditures per pupil by 84 cents around 1913. This estimate is statistically different from zero and insignificantly different from one. Column (2) shows that the change in state appropriations has the greatest effect on instructional expenditures. The effect of a one dollar per pupil increase in state appropriations is a statistically significant 57-cent-per-pupil increase in expenditures on teachers around 1913. The finding that expenditures on teachers are most affected by budget shocks is no surprise since they represent over three-quarters of all school expenditures in 1912, as shown in Table 3.

The effect on support expenditures, which includes the salaries and expenditures of county-level administrators, is a statistically significant 6-cent-per-pupil increase in response to a one dollar increase in per pupil appropriations, shown in column (3). I also separately consider the impact of budget shocks on County Superintendent's salary, a component of support expenditures. The results, shown in column (4), indicate that 76 percent of the increase in support expenditures per pupil can be accounted for by the increase in the salary of the County School Superintendent. This shows that even the County Superintendent's salary is responsive to budget shocks. Although capital expenditures made up 8.8 percent of all expenses on average in 1912, the results in column (5) show them to be unresponsive to budget shocks. This is possibly due to the fact that capital expenditures are very lumpy during this period.[26]

I next consider whether the effects of budget shocks are symmetrical around zero. To test this, I group counties by whether they gained or lost state funds as a result of the update in official school-age population figures. Modifying Equation 5 to include an indicator variable for the counties that gained state funds ($Gainers_c$) and its interaction with per pupil appropriations ($\Delta Approp\ PP_c$), as well as its interaction with each of the controls ($\Delta X_c$), yields:

$$\Delta Teacher\ Exp\ PP_c = \alpha_0 + \alpha_1 Gainers_c + \beta_0 \Delta Approp\ PP_c + \beta_1(\Delta Approp\ PP_c * Gainers_c) + \eta_0 \Delta X_c + \eta_1(\Delta X_c * Gainers_c) + \varepsilon_c \quad (7)$$

Table 7 presents results. Only the relationship between the change in appropriations and the change in support expenditures differs significantly by whether the county gained or lost state appropriations. A one-dollar increase in appropriations per pupil led to a 10-cent increase in support expenditures per pupil, whereas a one-dollar decrease in appropriations per pupil led to a 5-cent decrease in support expenditures per pupil.

[26] By lumpy, I mean that county school boards spend zero dollars on new buildings in most years punctuated by years of large expenditures.

Other effects on expenditures do not differ statistically across the two groups, but it should be noted that the coefficients on the interaction term are sizable in some cases.

Anecdotal evidence of how school boards economized in times of budget distress is consistent with these results. County School Superintendents most often cited teacher salaries and length of the school term as margins for trimming the budget. This is evidenced by the Clarke County School Superintendent, who stated: "After this year we shall have only the school fund received from the State to depend on, and unless some plan is devised to supplement this, we shall be compelled to shorten our school term, or so reduce salaries as will drive away our best teachers" (Georgia Department of Education 1910, 86). The effect of both courses of action is to reduce instructional expenditures.

### 7.2 The Effect of Budget Shocks on Expenditures by Race

I now analyze the impact of budget shocks on expenditures by race utilizing the specification shown in Equation 6. Table 8 presents the results of regressions of change in instructional expenditures per pupil on change in appropriations per pupil. The estimates shown in columns (1) through (3) pertain to the full sample of counties, while columns (4) through (6) pertain to "losers" only and columns (7) through (9) to "gainers." First, consider the effect of budget shocks following the 1913 school census, as shown in the top panel. The coefficient 0.0502 in column (1) of the top panel suggests that a one-dollar increase in appropriations per pupil increased expenditures on teachers per pupil in African-American schools by 5 cents, but this result is not statistically significant with a standard error of 0.08. By contrast, instructional expenditures per white pupil increased by $1.15 in response to a one dollar increase in appropriations per pupil, as shown in column (2) of the top panel. This result is highly significant, with a standard error of 0.21. The dependent variable in column (3) is the two-year change in the racial differential (African-American minus white) in instructional expenditures per pupil. The result shows the estimated effects of budget shocks to be statistically different across race.

Around 1913, the results for "losers," or those counties whose appropriations from the state fell following the census, are quite similar to those found when utilizing the full sample. I find no evidence that instructional expenditures in African-American schools respond to budget cuts; the coefficient on change in appropriations per pupil is -0.0043 with a standard error of (0.112), as shown in column (4) of the top panel. Moreover, the coefficient -1.4371 in column (6) reveals that the racial gap in instructional expenditures per pupil decreased by $1.44 for every dollar per pupil cut in state appropriations, and it is highly significant. This suggests that a 92 cent, or 1 standard deviation, reduction in state appropriations per pupil would have decreased the racial gap in instructional expenditures per pupil by 23 (1.44×92/569) percent at the 1912 mean, at least in the short run.

While the analysis has thus far focused on the effect of budget shocks around the school census of 1913, significant budget shocks also followed other school censuses. Table 8 compares the effect of two-year changes in appropriations around 1913 to that of analogous budget shocks around the school censuses of 1918 and 1923. As with 1913, budget shocks following the 1918 school census have no impact on instructional expenditures per pupil for African-American schools, but rather they are absorbed by instructional expenditures per white pupil, as shown in columns (1) and (2) of the middle panel of Table 8. The estimates pertaining to the 1918 school census are particularly helpful in clarifying how counties responded to budget surpluses. Almost every county experienced an absolute increase in appropriations from the State School Fund in the following adjustment year because of a secular increase in the size of the fund by $300,000, or 9.3 percent. Columns (7) and (8) of the middle panel show that those surpluses were not spent on African-American schools, but instead white schools captured all of the gains. A one dollar increase in appropriations per pupil is associated with a 2-cent decrease in instructional expenditures on African-American schools and a $1.84 increase in instructional expenditures on white schools, but only the latter is statistically significant.

The bottom panel of Table 8 displays the results for the 1923 school census. In the following adjustment year most counties in Georgia experienced a decrease in their appropriations from the state, in absolute terms, despite the fact that total disbursements from the State School Fund increased by $250,000, or nearly 6 percent. This is in part due to a shift in migration patterns as the population became increasingly urban.[27] Thus, the results for 1923 are understandably different from prior years. The coefficient 0.4541 in column (4) indicates that instructional expenditures per African-American pupil decreased by 45 cents as a results of a one-dollar decrease in appropriations per pupil. This suggests that expenditures on African-American teachers became responsive to budget shocks by the 1920s. Still, the results presented in column (6) show that the differential in instructional expenditures per pupil across race decreased dollar-for-dollar with state appropriations.

The above estimates show that budget cuts were met through reduced expenditures on white teachers in the short run. In the longer run, however, school boards would have more flexibility to adjust by both increasing revenues and shifting cuts in expenditures. To examine the effect of budget shocks over time, Table 9 compares the analysis of two-year changes in instructional expenditures to that of three-year, four-year, and five-year changes. The effect of a cut in appropriations following the 1913 school census update was quite persistent. The five-year change, that is the change from 1912 to 1917, analysis reveals the reduction in instructional expenditures on whites remained four years after the cut in appropriations from the State

[27] The average urban population share, as of 1920, of those counties gaining appropriations in absolute terms in 1924 was 20.3 percent, but for "losers" was 8.3 percent. Additionally, average population density for "gainers" was 124 percent greater than that of "losers" (calculated using Haines and ICPSR 2010). This is consistent with the observation that northward-bound migrants during the Great Migration first moved to urban areas in the South (Collins 1997; Bethel 1991).

School Fund took effect (in 1914). For the "losers," the response of instructional expenditures on African Americans remained statistically insignificant over the five-year period, with the coefficient suggesting a 12-cent decrease with each dollar decrease in appropriations. Meanwhile, instructional expenditures per white pupil fell by $1.12 given a one-dollar decrease in appropriations per pupil. The $1.12 decrease is statistically significant at the 1 percent level. Thus, the five-year change estimates for "losers" show the racial gap in instructional expenditures per pupil decreased dollar-for-dollar with state appropriations. Therefore, school boards did not shift cuts in expenditures to African-American schools in the long run. Moreover, school boards were either unwilling or unable to make up for reduced state appropriations with other revenues, even in the long run.

The other category of expenditures consistently reported separately by race during this period was capital expenditures, which includes funds spent on buildings, equipment, supplies, and repairs. Table 10 presents the results from regressions of change in capital expenditures per pupil on change in appropriations per pupil, by race and sign of budget shock, around the school censuses. I find no evidence that appropriations significantly impacted capital expenditures for either race. As stated before, the lack of an effect might be due to the lumpiness of capital expenditures. However, it could also be that new schools were funded primarily by other means, such as private donations, bond sales, property sales, and local taxation (see Carruthers and Wanamaker 2013).

### 7.3 Specification Tests

The validity of the above estimates relies on the assumption that county school boards could not accurately predict changes in the school-age population and, thus, the shock to their budgets in adjustment years.[28] However, school boards had access to information on enrollment trends and the demographic characteristics of new enrollees. This information should have given them some insight regarding the growth rate of the local school-age population. The County Boards of Education might have used this information to help smooth expenditures over the long run. If so, my estimates would understate the effect of an unforeseen shock to school revenues.

For evidence of the validity of my estimates, I test whether changes in state appropriations per pupil from 1912 to 1914 affect prior changes in various expenditures per pupil from 1909 to 1911, controlling for lagged trends in enrollment and percentage of African-American children in the school-age population.[29] Table 11 presents the results of this test. The change in appropriations from 1912 to 1914 does not have

[28] Since the State School Fund was disbursed based on each county's relative school-age population, an accurate prediction of education funds received from the state after the next school census would require not only an understanding of the school-age population growth rate of the county but also that of the state as a whole.

[29] I cannot control for lagged five-year trends in local tax revenues, as in my main specification, because local tax revenues were not reported as a separate category prior to 1908.

predictive power for anterior changes in county-level receipts (top panel) or expenditures (middle panel). For example, a one dollar increase in appropriations per pupil from 1912 to 1914 is associated with a 21-cent decrease in total expenditures from 1909 to 1911, with a standard error of 0.29 (as shown in Column (1) of the middle panel). Furthermore, the bottom panel of Table 11 shows that changes in appropriations from 1912 to 1914 do not explain prior changes in instructional expenditures by race. While school boards might have had some knowledge of population trends, it seems that they did not effectively use that information to smooth expenditures. Moreover, the direction of the effect implies that any pre-trend is overwhelmed by the appropriations shock, rather than the estimated effect of the change in appropriations being driven by pre-existing trends.

Indeed, the County Board of Education may have been limited in its ability to borrow and save, necessary tools for smoothing expenditures. While school boards were not legally limited in their ability to save, they saved very little. The balance on hand of the average county at the end of the 1912 school year amounted to a mere 41 cents per pupil. This "savings" was less than ten percent of the average appropriation from the state in 1912 and would cover little more than the County Superintendent's salary (see Table 3). Borrowing, on the other hand, was limited by law. The County Board of Education was only permitted to take out intra-annual loans in order to pay teachers in a timely manner, with the total amount of loans limited to the county's appropriation from the State School Fund.[30] Starting in 1912, the County Board of Education could raise revenues by issuing bonds but only for the purpose of building school houses. Any bond issues were repaid by additional local taxes on property.[31] Still, the County Board of Education was unable to borrow inter-annually against future revenues to cover the majority of its expenses, payments to teachers.

An additional threat to the validity of my findings is that omitted variables explain both population growth and racial discrimination in school finance. In this section, I present results for an additional specification that accounts for a number of pre-shock county-level characteristics that may be correlated with both net migration of the school-age population and school boards' propensities to spend funds on one race over the other. First, however, Table 12 provides summary statistics for these characteristics as of 1910, broken down by "gainers" and "losers" following the 1913 school census. The two groups are remarkably similar in terms of urban population share, illiteracy rate, homeownership rate, and share of land in farms. The "losers" had a slightly higher African-American share, tenant farm share, and proportion of improved acreage in cotton, but a difference in means test reveals these disparities to be not statistically significant. In fact, the only

[30] *An Act to allow county Boards of Education to borrow money to pay the salaries of the public school teachers*, GA No. 296, Sec. 1, July 15, 1910, in *Acts and Resolutions of the General Assembly of the State of Georgia, 1910*, Part 1, Title 6, p. 77.

[31] *An Act to provide for issuing bonds for the purpose of building school houses in school districts in which a local tax is now or may hereafter be levied for school purposes*, GA No. 537, August 17, 1912, in *Acts and Resolutions of the General Assembly of the State of Georgia, 1912*, Part 1, Title 5, p. 176.

statistically significant difference in means across the two groups is that "gainers" had a higher percentage of improved land planted in corn.

I add to Equation 6 each of the county characteristics in 1910 shown in Table 12 as additional controls. The additions allow the estimated effect of budget shocks to be conditional on pre-shock attributes that may have driven trends in expenditures. Table 13 lists the estimates from the 1913 school census shock. There is little difference between the baseline results for instructional expenditures, presented in the top panel of Table 8, and those that control for pre-shock characteristics, presented here. Even after controlling for county attributes, I find that instructional expenditures per pupil on African-American schools were unresponsive to budget cuts, with instructional expenditures on white schools absorbing the shock.

## 8 Concluding Remarks

This paper provides new insight into the behavior of county school boards in the South after the de facto disfranchisement of African Americans. I find that school board expenditures responded approximately one for one to adjustments in revenue. This provides historical evidence of a flypaper effect in the school finance context. An analysis of differential effects in expenditures by race shows that African-American schools were little affected by budget shocks, in comparison to white schools. This result suggests that there was little fat to trim from the budgets of African-American schools, implying that school boards kept them close to some minimally acceptable level. Moreover, in Georgia in the 1910s it appears that County Boards of Education, in their financing of schools for African-American children, were not motivated by altruism or the existence of positive externalities. Rather, the evidence is consistent with the idea that the school boards provided African-American schools with the minimum amount of monies necessary to avoid litigation, or maintain token compliance with state and federal "equality" laws.

Important questions remain regarding the physical impact of these budget shocks. Future work will consider how changes in appropriations affected measured school quality, such as term length, the qualifications of teachers, number of teachers, and number of schools. This will provide further insight into the margins along which expenditures were reduced in response to budget cuts. Additionally, the periods of relative over-funding and under-funding of schools caused by the infrequent enumeration of the school-age population likely had an impact on human capital accumulation. Thus, I plan to explore the long-run outcomes of exposure to school budget distress and surplus at the individual-level using linked census data.

## A Data Appendix

This paper utilizes county-level data on receipts, expenditures, and appropriations of schools in Georgia from 1909 through 1924. Additionally, I use data on enrollment from 1907 to 1924 and school-age population from 1903 to 1923. The data were collected from the *Annual Report of the Department of Education to the General Assembly of the State of Georgia*. Several scholars have utilized data from this source for other projects, yet, to my knowledge, my data are the first to provide a complete transcription of all information provided on receipts and expenditures in these reports for this time period. This appendix describes the data and cleaning process in detail.

The tables of receipts and expenditures were digitized using optical character recognition (OCR) software. Since I digitized entire tables, I was able to use their structure to easily identify potential errors in transcription. For example, the sum of expenditures on male teachers and expenditures on female teachers should equal the reported total expenditures on teachers. For all counties in which a simple check of addition indicated an error, the transcribed data was compared with the published tables and mistakes in transcription were corrected. I am, therefore, confident that the raw data are an accurate reflection of the published statistics.

Unfortunately, after correcting for errors in transcription, in any given year there remained a non-trivial number of inconsistencies. A second advantage of having digitized the complete tables, therefore, is that their structure and redundancy allowed me to triangulate and correct for inconsistencies in the published statistics resulting from errors in typesetting and arithmetic. Take, for example, reported expenditures on African-American schools in Fayette County in 1915: The reported statistics show expenditures of $1,300 on female teachers and $350 on male teachers, which sum to $1,650, but the published total expenditures on teachers is $1,550, one hundred dollars less. This indicates that one of the three published figures for expenditures on teachers is incorrect. Clarifying whether the published total instructional expenditures is in error makes use of additional information. The sum of the reported total expenditures on teachers and capital expenditures comes to $1,760, while reported total expenditures is $1,860. This suggests that the reported total expenditures on teachers is in error since increasing it by $100 resolves both inconsistencies. In this case, $1,550 was replaced with $1,650 for total instructional expenditures.

Since there may be multiple errors for the same county-year, it is not always as clear cut as the above example illustrates. Thus, corrections were made on a case by case basis. Additionally, while inconsistencies in total expenditures on teachers can be resolved as illustrated, not all inconsistencies can be clearly attributed to a particular table cell and, thus, some remain unaddressed. Yet I take solace in the fact that I have done everything possible to clean the data of errors, even those that were not my own.

## B Legal Aspects of Segregated Schooling

### B.1 Decisions of the State Supreme Courts

To understand what constituted a minimally acceptable level of African-American school provision it is necessary to examine how the courts interpreted Georgia's equality clause, and the Fourteenth Amendment more generally. Only once between 1896 and 1925, to my knowledge, did the Supreme Court of the State of Georgia hear a case regarding racial inequality in the provision of schooling. That case was *Board of Education v. Cumming* of 1898.

In 1897, the Richmond County Board of Education closed the only public high school serving African Americans in the county. In response, Cumming, and other parents of African-American high school students, petitioned against the use of their tax dollars to support the high school serving whites, which remained open. In a progressive ruling, the Superior Court of Richmond County enjoined the board from using any of its funds to support the white high school, until the board provided equal high school facilities for African Americans. The case was then appealed to the Supreme Court of Georgia, which unanimously reversed the lower court's ruling. The justices interpreted the law as giving broad discretion to the county board in establishing high schools, and not requiring equal high school facilities for both races.[32] However, in regards to the state's equality clause, which they found only pertained to grammar schools, the justices wrote in their opinion: "This section gives the board no discretion. It is compulsory upon it to establish proper arrangements to educate the children of both races, and to provide the same facilities for each as to schoolhouses, fixtures, and the various other matters pertaining to education."[33] While the meaning of "same" may be debated, this opinion makes clear that a complete lack of provision of elementary education for African Americans, where there was demand, would not be tolerated.[34]

Cases from other Southern states, while not setting precedent in Georgia, are instructive as to the broader interpretation of such laws in the region. In 1871, *Union City v. Robinson* established in Arkansas that separate schools for African Americans and whites were required as long as children of both races resided in the school district.[35] This issue was again addressed in Arkansas in 1885 with *Maddox v. Neal*, which

[32] At the turn of the twentieth century, high schools were quite uncommon in the South (Goldin 1998), which may explain the court's view that they should be treated differently. In fact, only 29 of 137 counties in Georgia in 1899 provided a public high school for the children of either race (Georgia Department of Education 1900).

[33] Board of Education v. Cumming, 103 Ga. 641 (1898).

[34] This case was subsequently brought before the United States Supreme Court. After examining the particulars of the case, the justices found that the board was not in violation of the Fourteenth Amendment and affirmed the state court's ruling, adding "that while all admit that the benefits and burdens of public taxation must be shared by citizens without discrimination against any class on account of their race, the education of the people in schools maintained by state taxation is a matter belonging to the respective States, and any interference on the part of Federal authority with the management of such schools cannot be justified except in the case of a clear and unmistakable disregard of rights secured by the supreme law of the land" (Cumming v. Richmond County, 175 U.S. 528 (1899) at 545).

[35] County Court of Union City v. Robinson, Trustee, 27 Ark. 116 (1871).

resulted in the court compelling the school board to open schools for African Americans.[36] In 1898, West Virginia courts found that the law required white and African-American schools to open for the same term length.[37] A decade later, the Supreme Court of Mississippi ruled on *McFarland v. Goins* finding that a special tax on all citizens to support an agricultural high school for whites was in violation of the Fourteenth Amendment.[38] The courts of Oklahoma also addressed the lack of schools for African Americans, mandating in *Guthrie v. Excise Board* that tax revenues must be distributed so as to provide adequate facilities for African Americans equal to the white schools.[39] While the Southern courts did not always rule in favor of African Americans, they objected to complete negligence in the provision of schools for them.[40] The steady occurrence of such cases would have provided a constant reminder to the County Boards of Education that they could not cut funding for African-American schools to zero.

### B.2 Decisions of the State Superintendent and State Board of Education

While courts' opinions are instructive, most issues with respect to school administration would have been handled outside of the courts. The Georgia legislature declared that issues of school law and administration be adjudicated within the Department of Education. To this end, the County Board of Education served as "a tribunal for hearing and determining any matters of local controversy in reference to the construction or administration of the school law," and the decision of the County Board of Education was "binding upon the parties to the controversy; provided, that either of the parties shall have the right to appeal to the State School Commissioner."[41] In turn, the State Board of Education constituted "a body in the nature of a court, to which appeals shall be from the decision of the State School Commissioner upon any question touching the construction or administration of the school laws, and the decision of the State Board, when rendered, shall be final and conclusive upon the matter in issue."[42] What constituted a minimally acceptable level of funding for African-American schools, then, was decided by the State Superintendent of Education and the State Board of Education.

The record suggests that Marion Luther Brittain, Georgia State Superintendent of Schools (1910-1922), was more progressive than his local counterparts with respect to the education of African Americans. Shortly after he took office, Brittain labored to provide a state supervisor for African-American schools, to supple-

[36] Maddox v. Neal, 45 Ark. 121 (1885).

[37] Williams v. Board of Education of Fairfax District, 45 W. Va. 199 (1898).

[38] McFarland v. Goins, 96 Miss. 67 (1909).

[39] Guthrie v. Excise Board of Logan County, 86 Okla. 24 (1922).

[40] Risen (1935) provides an extensive review of cases pertaining to race and public schooling during the late nineteenth and early twentieth centuries.

[41] *Revising, Amending and Consolidating the Common School Laws*, GA No. 587, Sec. 22, October 27, 1887, in *Acts and Resolutions of the General Assembly of the State of Georgia 1886-7*, Volume 2, Part 1, Title 8, p. 74.

[42] *Revising, Amending and Consolidating the Common School Laws*, GA No. 587, Sec. 5, October 27, 1887, in *Acts and Resolutions of the General Assembly of the State of Georgia 1886-7*, Volume 2, Part 1, Title 8, p. 69.

ment the three state supervisors that oversaw the white schools. After failing to secure funds from the General Assembly, Brittain appealed to the General Education Board of New York, a philanthropic organization for the promotion of education, who provided $3,500 annually to cover the salary and expenses of a state supervisor for African-American schools. In justification for this, Brittain wrote: "We could, of course, neglect these schools and allow the money spent upon them to be largely wasted. It is better, however, to supervise them properly and to increase the productive power of this large proportion of our population" (Georgia Department of Education 1914, 54).

Brittain later progressively campaigned for the establishment of a normal school for African Americans, stating:

> As a matter of common justice and equity, as well as law, the State should do more for its colored population. We devote considerable money to the education of the negro children and yet pay very little attention to the sort of training which they ought to have.... [W]e have left this matter too much to chance and northern philanthropists. It is time that we should take a more direct and positive interest in the preparation of negro teachers ourselves. I recommend, therefore, that the Legislature make an appropriation looking toward the establishment of a Normal School for negro teachers to emphasize instruction in agriculture, cooking, sewing, hygiene and the essentials of elementary education.... If we are to keep contented the best labor a country ever had upon its farms, we must give more attention and preparation to these teachers and schools. (Georgia Department of Education 1917, 10-11)

It should be noted that neither Brittain nor the Department of Education would have gained directly from the establishment of such a normal school; any new normal school would have been governed by the University of Georgia Trustees, as were all state supported institutions of higher education in Georgia.

Brittain was not alone in making progressive statements with regards to the education of African Americans. His predecessors also made remarks similar in sentiment. As part of an appeal for greater taxation to support schools, Gustavus Richard Glenn, State School Commissioner (1895-1903) and State Board of Education Member (1911-1923), argued:

> As I see the case of the negro, his real and trustworthy friend, the friend upon whom he must rely, the only friend who can and will understand him, is the white man here in the South. If we abandon him his case is hopeless. If we cannot apply right processes to education to save him, and make him a skillful producer of wealth and a useful citizen, then God have mercy upon his children and our own. (Georgia Department of Education 1902, 26-27)

Despite the paternalistic tone, the argument is in favor of increased expenditures on African-American schools.

While these words and actions do not provide evidence of their opinions in the manner of a court decision, they do suggest that the state-level administrators were more liberal in mind than were local school officials. Thus, they likely held a higher standard as to what constituted a minimally acceptable level of school quality for African Americans, and they had the power to enforce that standard.

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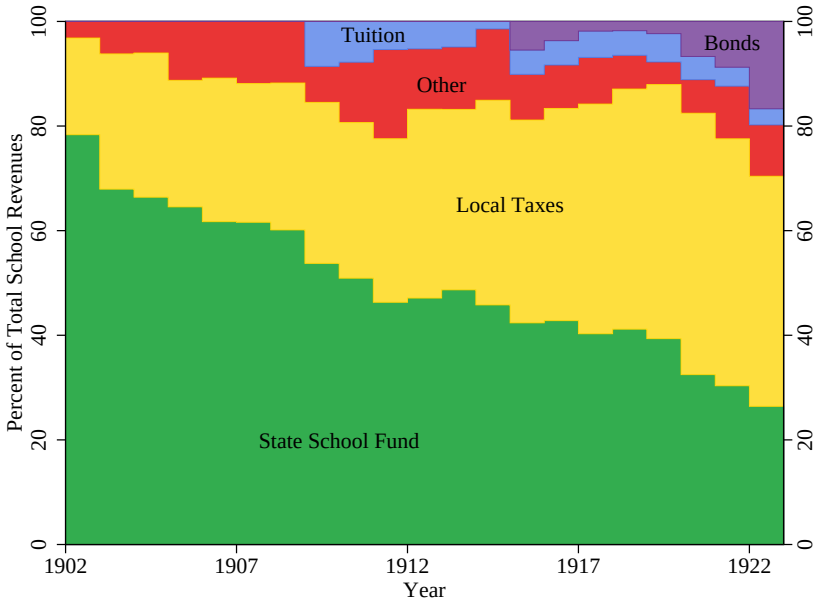
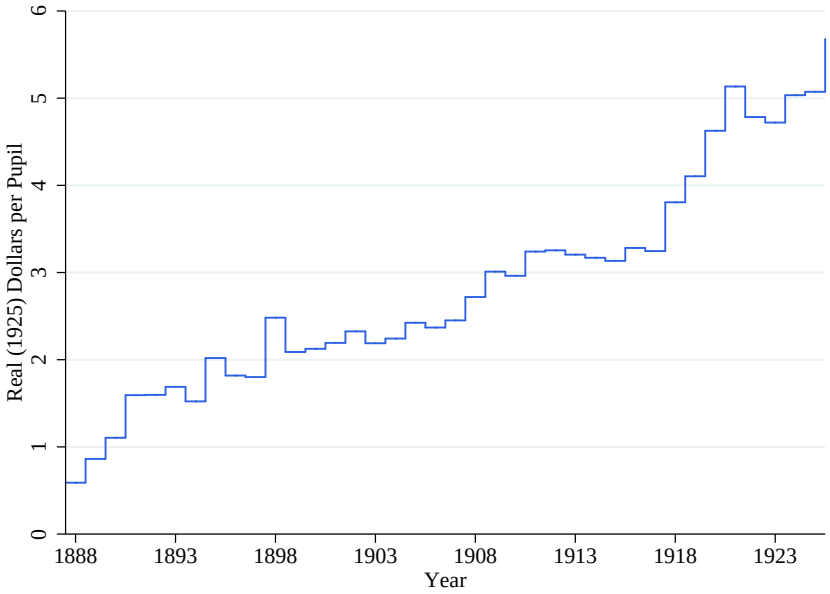
Figure 1: Sources of School Revenues by Year, 1902–1922



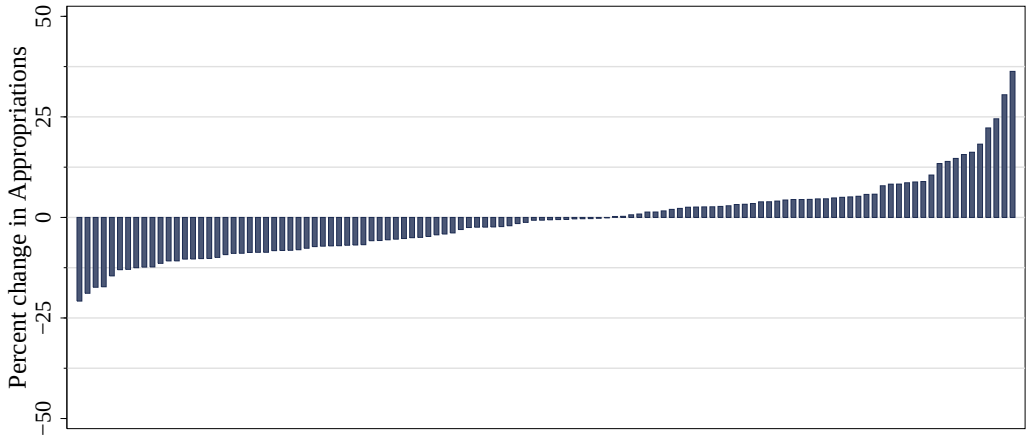

*Notes:* Displays the relative contribution of various sources to total school revenues. Tuition is included in the other category prior to 1909. Proceeds from the sale of bonds are included in the other category from legalization in 1912 to 1914.
*Source:* Reports of the Georgia Department of Education, 1903–1923.

Figure 2: Disbursements from the State School Fund per Pupil (1925$), 1888–1926

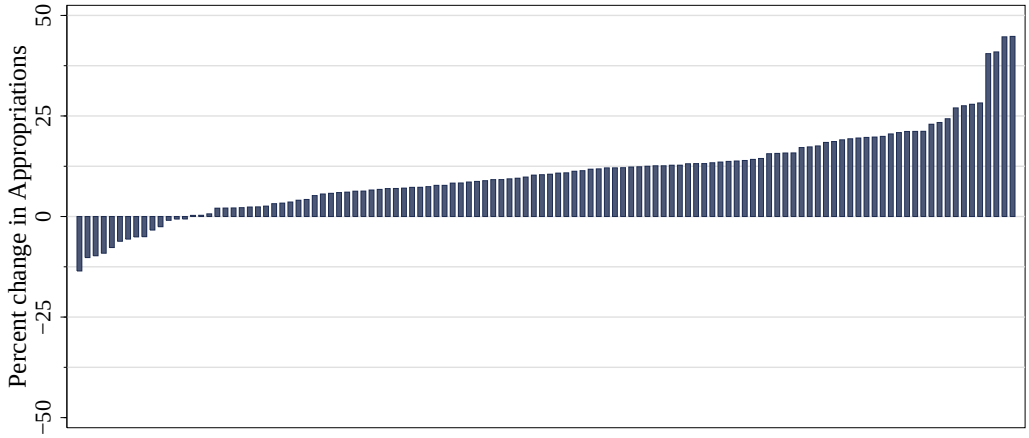



*Source:* Reports of the Georgia Department of Education, 1889-1927.

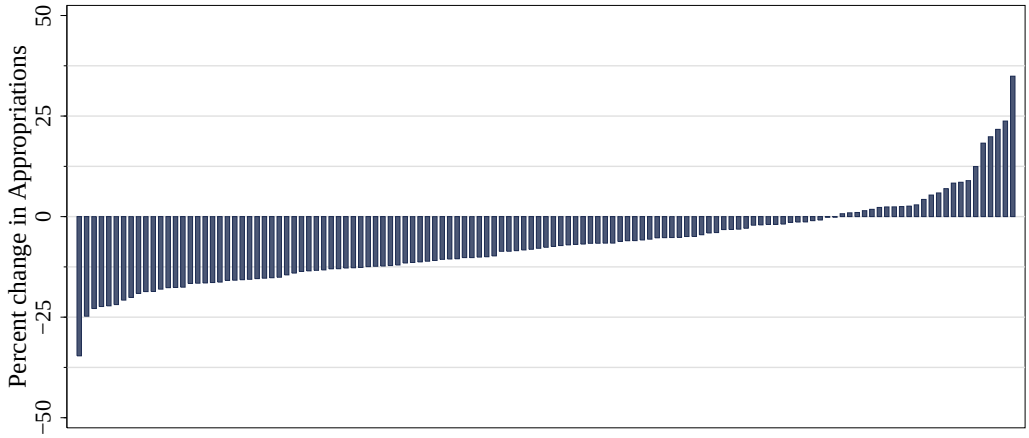
Figure 3: Percent Change in County-Level Appropriations around Census Years




(a) 1912 to 1914




(b) 1917 to 1919




(c) 1922 to 1924

*Note:* Each new school census caused varied changes in appropriations from the State School Fund at the county level in adjustment years. Each bar represents the percent change in appropriations received by a county as a result of the relevant census update. Counties are rank ordered by percent change in appropriations in each adjustment year. *Source:* Reports of the Georgia Department of Education, various years.

Table 1: School Laws of Select Southern States circa 1910

| | |
|---|---|
| Georgia | **Public schools established** by State Constitution of 1868.<br>**Apportionment** of state school funds by school-age population.<br>**School census** taken every five years.<br>**Equality clause:** Yes.<br>**School board** appointed by grand jury.<br>**Local taxation** allowed with the approval of two-thirds of those voting, up to 5 mills. |
| Alabama | **Public schools established** by State Constitution of 1868.<br>**Apportionment** of state school funds by school-age population.<br>**School census** taken biennially.<br>**Equality clause:** No.<br>**School board** appointed by school trustees, which were elected by voters.<br>**Local taxation** allowed with the approval of three-fifths of those voting, up to 1 mill. |
| Florida | **Public schools established** by State Constitution of 1868.<br>**Apportionment** of state school funds by average attendance.<br>**School census** taken every ten years.<br>**Equality clause:** Yes ("impartial provision" for both races).<br>**School board** elected by voters.<br>**Local taxation** mandatory at not less than 3 mills nor more than 7 mills. |
| South Carolina | **Public schools established** by State Constitution of 1868.<br>**Apportionment** of state school funds by enrollment.<br>**School census** not taken.<br>**Equality clause:** No.<br>**School board** appointed by the State Board of Education, which itself was appointed by the Governor.<br>**Local taxation** mandatory at 3 mills. |
| Tennessee | **Public schools established** by Public School Act of 1873.<br>**Apportionment** of state school funds by school-age population.<br>**School census** taken annually.<br>**Equality clause:** No.<br>**School board** elected by voters.<br>**Local taxation** allowed, without voter consent, if additional funds were necessary to keep schools open for the minimum required term length. |

Sources: Alabama Department of Education, 1915, *General Public School Laws of Alabama*, Montgomery: State Printer. Florida Department of Public Instruction, 1911, *Digest of the School Laws of the State of Florida*, Tallahassee: State Printer. Georgia Department of Education, 1912, *Georgia School Laws and Decisions*, Atlanta. Tennessee Department of Public Instruction, 1911, *Public School Laws of Tennessee*, Nashville. South Carolina Department of Education, 1912, *General School Law of South Carolina*, Columbia.

Table 2: Mean County-Level School Expenditures by Race

| *1912* | | | | | | |
|---|---|---|---|---|---|---|
| | Black | | White | | Difference | |
| Enrollment | 1334 | [994] | 1842 | [1176] | -508 | (145) |
| Enrollment rate (%) | 62 | [15] | 81 | [12] | -18 | (2) |
| Teachers' salaries per pupil (¢) | 232 | [134] | 802 | [374] | -569 | (37) |
| Capital expenditures per pupil(¢) | 6 | [11] | 108 | [159] | -102 | (15) |
| Total expenditures per pupil (¢) | 239 | [137] | 910 | [476] | -672 | (47) |
| Number of counties | 113 | | 113 | | | |
| *1917* | | | | | | |
| | Black | | White | | Difference | |
| Enrollment | 1622 | [1152] | 2153 | [1235] | -531 | (157) |
| Enrollment rate (%) | 76 | [16] | 86 | [10] | -10 | (2) |
| Teachers' salaries per pupil (¢) | 204 | [96] | 828 | [461] | -624 | (44) |
| Capital expenditures per pupil (¢) | 11 | [27] | 91 | [136] | -80 | (13) |
| Total expenditures per pupil (¢) | 215 | [107] | 920 | [546] | -704 | (52) |
| Number of counties | 115 | | 115 | | | |
| *1922* | | | | | | |
| | Black | | White | | Difference | |
| Enrollment | 1518 | [1071] | 2412 | [1544] | -894 | (167) |
| Enrollment rate (%) | 78 | [17] | 90 | [9] | -12 | (2) |
| Teachers' salaries per pupil (¢) | 385 | [208] | 1469 | [673] | -1083 | (63) |
| Capital expenditures per pupil (¢) | 25 | [57] | 451 | [1110] | -426 | (99) |
| Total expenditures per pupil (¢) | 410 | [224] | 1920 | [1284] | -1509 | (116) |
| Number of counties | 127 | | 127 | | | |

Notes: The columns labeled "Black" and "White" report means for the respective race with standard deviations in brackets. The column labeled "Differences" reports differences in means estimated from regressions and presents standard errors in parentheses. All monetary figures are in nominal cents.

Table 3: Summary Revenue and Expenditure Statistics for 1912, 1917, 1922

| *1912* | | | | | | |
|---|---|---|---|---|---|---|
| | Losers | | Gainers | | All | |
| Enrollment | 3239 | (1697) | 3090 | (1415) | 3176 | (1578) |
| Enrollment rate (%) | 73 | (12) | 70 | (10) | 72 | (11) |
| Appropriation per pupil (¢) | 482 | (123) | 431 | (58) | 460 | (104) |
| **Receipts and Expenditures (¢):** | | | | | | |
| State receipts per pupil | 471 | (145) | 416 | (90) | 448 | (127) |
| Local tax receipts per pupil | 117 | (189) | 134 | (167) | 124 | (179) |
| **Total receipts per pupil** | 715 | (323) | 695 | (244) | 706 | (291) |
| Teachers' salaries per pupil | 498 | (185) | 491 | (138) | 495 | (166) |
| Support expenditures per pupil | 40 | (18) | 43 | (20) | 41 | (19) |
| Superintendent pay per pupil | 32 | (13) | 33 | (15) | 32 | (14) |
| Capital expenditures per pupil | 49 | (58) | 68 | (91) | 57 | (74) |
| **Total expenditures per pupil** | 657 | (305) | 636 | (227) | 648 | (274) |
| Number of counties | 65 | | 48 | | 113 | |
| *1917* | | | | | | |
| | Losers | | Gainers | | All | |
| Enrollment | 3604 | (1663) | 3798 | (1693) | 3774 | (1683) |
| Enrollment rate (%) | 82 | (11) | 81 | (9) | 81 | (10) |
| Appropriation per pupil (¢) | 449 | (54) | 385 | (45) | 393 | (50) |
| **Receipts and Expenditures (¢):** | | | | | | |
| State receipts per pupil | 462 | (68) | 388 | (60) | 397 | (66) |
| Local tax receipts per pupil | 155 | (143) | 200 | (212) | 194 | (205) |
| **Total receipts per pupil** | 721 | (232) | 715 | (388) | 715 | (372) |
| Teachers' salaries per pupil | 487 | (80) | 488 | (182) | 488 | (173) |
| Support expenditures per pupil | 37 | (12) | 38 | (16) | 38 | (15) |
| Superintendent pay per pupil | 30 | (10) | 30 | (11) | 30 | (11) |
| Capital expenditures per pupil | 49 | (58) | 50 | (77) | 50 | (74) |
| **Total expenditures per pupil** | 696 | (239) | 664 | (348) | 668 | (336) |
| Number of counties | 14 | | 101 | | 115 | |
| *1922* | | | | | | |
| | Losers | | Gainers | | All | |
| Enrollment | 3957 | (1992) | 3816 | (1680) | 3930 | (1931) |
| Enrollment rate (%) | 85 | (10) | 78 | (10) | 83 | (10) |
| Appropriation per pupil (¢) | 598 | (88) | 537 | (82) | 586 | (90) |
| **Receipts and Expenditures (¢):** | | | | | | |
| State receipts per pupil | 622 | (144) | 542 | (141) | 607 | (146) |
| Local tax receipts per pupil | 564 | (464) | 692 | (380) | 588 | (451) |
| **Total receipts per pupil** | 1604 | (839) | 1722 | (752) | 1627 | (822) |
| Teachers' salaries per pupil | 917 | (300) | 1005 | (311) | 934 | (303) |
| Support expenditures per pupil | 55 | (25) | 54 | (18) | 55 | (24) |
| Superintendent pay per pupil | 45 | (20) | 47 | (16) | 46 | (19) |
| Capital expenditures per pupil | 262 | (589) | 278 | (380) | 265 | (555) |
| **Total expenditures per pupil** | 1470 | (793) | 1631 | (749) | 1500 | (785) |
| Number of counties | 103 | | 24 | | 127 | |

Notes: Means are reported by whether counties gained or lost state funds after the respective school censuses of 1913, 1918, and 1923. Standard deviations are in parentheses. All monetary figures are in nominal cents. A light gray background denotes the difference in means across groups is statistically significant at the 95-percent confidence level, while a dark gray background denotes significance at the 99-percent level.

Table 4: Distribution of Change in State Funds per Pupil

| | 1912 to 1914 | 1917 to 1919 | 1922 to 1924 |
|---|---|---|---|
| 1st percentile | -320 | -9 | -196 |
| 5th percentile | -142 | 26 | -133 |
| 10th percentile | -112 | 49 | -94 |
| 25th percentile | -69 | 80 | -57 |
| 50th percentile | -38 | 115 | -2 |
| 75th percentile | -9 | 147 | 62 |
| 90th percentile | 11 | 185 | 135 |
| 95th percentile | 33 | 198 | 208 |
| 99th percentile | 61 | 261 | 278 |
| Mean change | -51 | 115 | 9 |
| Standard deviation of Δ | 92 | 53 | 98 |
| Number of counties | 113 | 115 | 127 |

Notes: All figures are in nominal cents.

Table 5: Estimates of the Effect of Budget Shocks on School Revenues, 1912–1914

| | (1) $\Delta Receipts\ PP$ | (2) $\Delta State\ PP$ | (3) $\Delta Local\ Tax\ PP$ | (4) $\Delta Tuition\ PP$ |
|---|---|---|---|---|
| $\Delta Approp\ PP_t$ | 1.329*** | 1.045*** | 0.085 | 0.046 |
| | (0.20) | (0.08) | (0.12) | (0.05) |
| $\Delta Enrollment_{t-2}$ | 0.030 | -0.007 | -0.008 | -0.003 |
| | (0.03) | (0.01) | (0.02) | (0.01) |
| $\Delta Local\ Tax\ PP_{t-2}$ | -0.472*** | -0.020 | -0.483*** | -0.003 |
| | (0.11) | (0.04) | (0.06) | (0.03) |
| $\Delta Percent\ Black_{t-2}$ | -12.363* | -1.823 | -6.799 | 0.632 |
| | (7.07) | (2.86) | (4.19) | (1.69) |
| $Constant$ | 58.955*** | 2.917 | 42.160*** | 0.932 |
| | (21.65) | (8.76) | (12.82) | (5.17) |
| R-squared | 0.450 | 0.650 | 0.342 | 0.010 |
| Counties | 118 | 118 | 118 | 118 |
| Dependent Variable: | | | | |
| Mean | -28.333 | -56.950 | 17.863 | -2.354 |
| Std. Dev. | 237.127 | 120.460 | 128.445 | 42.192 |

Notes: Standard errors are reported in parentheses. All monetary figures are nominal. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Estimates of the Effect of Budget Shocks on School Expenditures, 1912–1914

| | (1) $\Delta Total\ Exp\ PP$ | (2) $\Delta Teacher\ PP$ | (3) $\Delta Support\ PP$ | (4) $\Delta Super.\ PP$ | (5) $\Delta Capital\ PP$ |
|---|---|---|---|---|---|
| $\Delta Approp\ PP_t$ | 0.843*** | 0.574*** | 0.055*** | 0.042*** | 0.035 |
| | (0.20) | (0.10) | (0.01) | (0.01) | (0.11) |
| $\Delta Enrollment_{t-2}$ | 0.027 | 0.011 | -0.001 | -0.001 | -0.005 |
| | (0.03) | (0.02) | (0.00) | (0.00) | (0.02) |
| $\Delta Local\ Tax\ PP_{t-2}$ | -0.465*** | 0.002 | -0.013** | -0.008** | -0.086 |
| | (0.11) | (0.06) | (0.01) | (0.00) | (0.06) |
| $\Delta Percent\ Black_{t-2}$ | -15.532** | -4.420 | 0.096 | 0.116 | -0.824 |
| | (7.23) | (3.59) | (0.39) | (0.24) | (3.99) |
| $Constant$ | 48.709** | 13.373 | 1.102 | 1.646** | 3.210 |
| | (22.12) | (10.97) | (1.20) | (0.72) | (12.20) |
| R-squared | 0.311 | 0.297 | 0.239 | 0.332 | 0.018 |
| Counties | 118 | 118 | 118 | 118 | 118 |
| Dependent Variable: | | | | | |
| Mean | -9.675 | -15.741 | -2.689 | -1.230 | -2.768 |
| Std. Dev. | 216.573 | 106.329 | 11.129 | 7.190 | 100.088 |

Notes: Standard errors are reported in parentheses. All monetary figures are nominal. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Estimates of the Effect of Budget Shocks on Expenditures by Direction of Shock, 1912–1914

| | (1) $\Delta Total\ Exp\ PP$ | (2) $\Delta Teacher\ PP$ | (3) $\Delta Support\ PP$ | (4) $\Delta Super.\ PP$ | (5) $\Delta Capital\ PP$ |
|---|---|---|---|---|---|
| $\Delta Approp\ PP_t$ | 0.782*** | 0.644*** | 0.048*** | 0.039*** | -0.030 |
| | (0.24) | (0.11) | (0.01) | (0.01) | (0.14) |
| $Gainers\ X\ \Delta Approp\ PP_t$ | 0.479 | -0.267 | 0.049** | 0.022 | 0.179 |
| | (0.47) | (0.22) | (0.02) | (0.01) | (0.26) |
| $Gainers$ | 3.881 | -79.461*** | -5.255** | -3.090** | 31.606 |
| | (46.81) | (21.78) | (2.37) | (1.46) | (26.34) |
| $Constant$ | 42.903 | 55.937*** | 4.282** | 3.453*** | -12.670 |
| | (32.31) | (15.03) | (1.64) | (1.01) | (18.18) |
| R-squared | 0.347 | 0.413 | 0.365 | 0.420 | 0.032 |
| Counties | 118 | 118 | 118 | 118 | 118 |

Notes: Standard errors are reported in parentheses. All monetary figures are nominal. $Gainers$ is an indicator variable for those counties whose appropriations from the state increased following the school census of 1913. All specifications include controls for lagged trends in enrollment, local tax revenues, and percentage of African-American children in the school-age population and the interaction of each with $Gainers$. *** p<0.01, ** p<0.05, * p<0.1.

Table 8: The Effect of Budget Shocks on Instructional Expenditures per Pupil by Race around the Census Years of 1913, 1918, and 1923

| | All | | | Losers | | | Gainers | | |
|---|---|---|---|---|---|---|---|---|---|
| | (1) Black | (2) White | (3) Difference | (4) Black | (5) White | (6) Difference | (7) Black | (8) White | (9) Difference |
| *1912 to 1914* | | | | | | | | | |
| $\Delta Approp\ PP_t$ | 0.0502 | 1.1487*** | -1.0985*** | -0.0043 | 1.4328*** | -1.4371*** | 0.1795 | -0.3257 | 0.5052 |
| | (0.082) | (0.216) | (0.218) | (0.112) | (0.269) | (0.268) | (0.156) | (0.476) | (0.489) |
| R-squared | 0.217 | 0.277 | 0.215 | 0.284 | 0.435 | 0.371 | 0.109 | 0.033 | 0.056 |
| Counties | 113 | 113 | 113 | 65 | 65 | 65 | 48 | 48 | 48 |
| *1917 to 1919* | | | | | | | | | |
| $\Delta Approp\ PP_t$ | 0.0111 | 1.7610*** | -1.7499*** | 0.6236 | 2.5005 | -1.8769 | -0.0170 | 1.8396*** | -1.8565*** |
| | (0.159) | (0.429) | (0.446) | (0.881) | (1.580) | (1.660) | (0.171) | (0.478) | (0.493) |
| R-squared | 0.006 | 0.187 | 0.172 | 0.365 | 0.720 | 0.713 | 0.001 | 0.157 | 0.150 |
| Counties | 115 | 115 | 115 | 14 | 14 | 14 | 101 | 101 | 101 |
| *1922 to 1924* | | | | | | | | | |
| $\Delta Approp\ PP_t$ | 0.4185*** | 1.3642*** | -0.9457** | 0.4541*** | 1.5515*** | -1.0974** | 0.0685 | 0.6431 | -0.5746 |
| | (0.145) | (0.448) | (0.447) | (0.162) | (0.526) | (0.521) | (0.386) | (0.982) | (1.020) |
| R-squared | 0.083 | 0.101 | 0.076 | 0.088 | 0.122 | 0.095 | 0.153 | 0.082 | 0.105 |
| Counties | 127 | 127 | 127 | 103 | 103 | 103 | 24 | 24 | 24 |

Notes: Standard errors are reported in parentheses. All monetary figures are nominal. "Losers" are counties whose appropriations from the state decreased following the school census of 1913, while appropriations for "Gainers" increased. All specifications include controls for lagged trends in enrollment, local tax revenues, and percentage of African-American children in the school-age population. *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Persistence of the Effect of Budget Shocks on Instructional Expenditures per Pupil Following the School Census of 1913

| | All | | | Losers | | | Gainers | | |
|---|---|---|---|---|---|---|---|---|---|
| | Black | White | Difference | Black | White | Difference | Black | White | Difference |
| *1912 to 1914* | | | | | | | | | |
| $\Delta Approp\ PP_t$ | 0.050 | 1.149*** | -1.099*** | -0.004 | 1.433*** | -1.437*** | 0.179 | -0.326 | 0.505 |
| | (0.08) | (0.22) | (0.22) | (0.11) | (0.27) | (0.27) | (0.16) | (0.48) | (0.49) |
| R-squared | 0.217 | 0.277 | 0.215 | 0.284 | 0.435 | 0.371 | 0.109 | 0.033 | 0.056 |
| Counties | 113 | 113 | 113 | 65 | 65 | 65 | 48 | 48 | 48 |
| *1912 to 1915* | | | | | | | | | |
| $\Delta Approp\ PP_t$ | 0.150 | 0.851*** | -0.701*** | 0.000 | 1.019*** | -1.018*** | 0.602** | 0.287 | 0.315 |
| | (0.10) | (0.23) | (0.24) | (0.11) | (0.31) | (0.31) | (0.27) | (0.48) | (0.55) |
| R-squared | 0.170 | 0.146 | 0.084 | 0.190 | 0.210 | 0.175 | 0.186 | 0.090 | 0.095 |
| Counties | 112 | 112 | 112 | 64 | 64 | 64 | 48 | 48 | 48 |
| *1912 to 1916* | | | | | | | | | |
| $\Delta Approp\ PP_t$ | 0.185** | 0.600** | -0.416 | 0.179 | 0.750** | -0.571* | 0.025 | 0.567 | -0.541 |
| | (0.09) | (0.26) | (0.26) | (0.11) | (0.34) | (0.33) | (0.22) | (0.58) | (0.61) |
| R-squared | 0.210 | 0.057 | 0.042 | 0.269 | 0.123 | 0.099 | 0.085 | 0.110 | 0.081 |
| Counties | 110 | 110 | 110 | 64 | 64 | 64 | 46 | 46 | 46 |
| *1912 to 1917* | | | | | | | | | |
| $\Delta Approp\ PP_t$ | 0.125 | 0.898*** | -0.773*** | 0.119 | 1.122*** | -1.003*** | 0.251 | 0.201 | 0.050 |
| | (0.10) | (0.28) | (0.28) | (0.11) | (0.36) | (0.36) | (0.33) | (0.64) | (0.66) |
| R-squared | 0.185 | 0.133 | 0.073 | 0.224 | 0.193 | 0.140 | 0.203 | 0.117 | 0.057 |
| Counties | 113 | 113 | 113 | 65 | 65 | 65 | 48 | 48 | 48 |

Notes: Standard errors are reported in parentheses. All monetary figures are nominal. "Losers" are counties whose appropriations from the state decreased following the school census of 1913, while appropriations for "Gainers" increased. All specifications include controls for lagged trends in enrollment, local tax revenues, and percentage of African-American children in the school-age population. *** p<0.01, ** p<0.05, * p<0.1.

Table 10: The Effect of Budget Shocks on Capital Expenditures per Pupil by Race around the Census Years of 1913, 1918, and 1923

| | All | | | Losers | | | Gainers | | |
|---|---|---|---|---|---|---|---|---|---|
| | (1) Black | (2) White | (3) Difference | (4) Black | (5) White | (6) Difference | (7) Black | (8) White | (9) Difference |
| *1912 to 1914* | | | | | | | | | |
| $\Delta Approp\ PP_t$ | 0.0182 | -0.0199 | 0.0381 | 0.0108 | -0.0717 | 0.0825 | 0.0111 | 0.1298 | -0.1187 |
| | (0.030) | (0.258) | (0.256) | (0.033) | (0.186) | (0.189) | (0.080) | (1.155) | (1.138) |
| R-squared | 0.107 | 0.036 | 0.033 | 0.340 | 0.046 | 0.043 | 0.071 | 0.048 | 0.051 |
| Counties | 113 | 113 | 113 | 65 | 65 | 65 | 48 | 48 | 48 |
| *1917 to 1919* | | | | | | | | | |
| $\Delta Approp\ PP_t$ | 0.0496 | 0.6044 | -0.5548 | 0.2358 | 0.3576 | -0.1218 | 0.0723 | 0.5729 | -0.5007 |
| | (0.047) | (0.384) | (0.383) | (0.226) | (1.874) | (1.938) | (0.050) | (0.420) | (0.415) |
| R-squared | 0.043 | 0.029 | 0.024 | 0.480 | 0.299 | 0.309 | 0.091 | 0.035 | 0.030 |
| Counties | 115 | 115 | 115 | 14 | 14 | 14 | 101 | 101 | 101 |
| *1922 to 1924* | | | | | | | | | |
| $\Delta Approp\ PP_t$ | 0.0586 | -1.4337 | 1.4924 | 0.1262 | -1.5614 | 1.6876 | -0.1546 | -1.5146 | 1.3600 |
| | (0.089) | (1.202) | (1.211) | (0.109) | (1.460) | (1.472) | (0.116) | (1.675) | (1.645) |
| R-squared | 0.056 | 0.099 | 0.105 | 0.066 | 0.124 | 0.129 | 0.265 | 0.168 | 0.179 |
| Counties | 127 | 127 | 127 | 103 | 103 | 103 | 24 | 24 | 24 |

Notes: Standard errors are reported in parentheses. All monetary figures are nominal. "Losers" are counties whose appropriations from the state decreased following the school census of 1913, while appropriations for "Gainers" increased. All specifications include controls for lagged trends in enrollment, local tax revenues, and percentage of African-American children in the school-age population. *** p<0.01, ** p<0.05, * p<0.1.

Table 11: Estimates of the Effect of Changes in Appropriations (1912–1914) on Prior Changes in Revenues and Expenditures (1909–1911)

*Revenues*

| | (1) $\Delta Receipts\ PP$ | (2) $\Delta State\ PP$ | (3) $\Delta Local\ Tax\ PP$ | (4) $\Delta Tuition\ PP$ |
|---|---|---|---|---|
| $\Delta Approp\ PP_{t+3}$ | -0.315 | 0.047 | -0.113 | -0.020 |
| | (0.27) | (0.11) | (0.11) | (0.08) |
| R-squared | 0.042 | 0.015 | 0.027 | 0.005 |
| Counties | 110 | 110 | 110 | 110 |

*Expenditures*

| | (1) $\Delta Total\ Exp\ PP$ | (2) $\Delta Teacher\ PP$ | (3) $\Delta Support\ PP$ | (4) $\Delta Super.\ PP$ | (5) $\Delta Capital\ PP$ |
|---|---|---|---|---|---|
| $\Delta Approp\ PP_{t+3}$ | -0.209 | -0.171 | -0.017 | -0.007 | -0.111 |
| | (0.29) | (0.13) | (0.02) | (0.01) | (0.17) |
| R-squared | 0.034 | 0.064 | 0.017 | 0.037 | 0.043 |
| Counties | 110 | 109 | 110 | 110 | 110 |

*Instructional Expenditures by Race*

| | All | | | Losers | | | Gainers | | |
|---|---|---|---|---|---|---|---|---|---|
| | (1) Black | (2) White | (3) Diff. | (4) Black | (5) White | (6) Diff. | (7) Black | (8) White | (9) Diff. |
| $\Delta Approp\ PP_{t+3}$ | -0.046 | -0.313 | 0.267 | -0.042 | -0.204 | 0.161 | 0.144 | -0.706 | 0.850 |
| | (0.08) | (0.23) | (0.22) | (0.09) | (0.26) | (0.25) | (0.25) | (0.76) | (0.66) |
| R-squared | 0.023 | 0.067 | 0.054 | 0.039 | 0.136 | 0.127 | 0.018 | 0.091 | 0.109 |
| Counties | 107 | 107 | 107 | 61 | 61 | 61 | 46 | 46 | 46 |

Notes: Standard errors are reported in parentheses. All monetary figures are nominal. "Losers" are counties whose appropriations from the state decreased following the school census of 1913, while appropriations for "Gainers" increased. All specifications include controls for lagged trends in enrollment and percentage of African-American children in the school-age population. *** p<0.01, ** p<0.05, * p<0.1.

Table 12: Pre-Shock Characteristics of Counties for 1910

| | Losers | | Gainers | | All | |
|---|---|---|---|---|---|---|
| Urban population (%) | 7.79 | (17.49) | 8.05 | (14.59) | 7.90 | (16.26) |
| Black (%) | 47.79 | (23.17) | 40.72 | (20.74) | 44.78 | (22.35) |
| Illiterate (%) | 22.68 | (7.25) | 21.19 | (6.82) | 22.05 | (7.08) |
| Homes owned by occupier (%) | 31.15 | (14.18) | 32.21 | (10.03) | 31.60 | (12.55) |
| Land in farms (%) | 75.46 | (15.59) | 75.24 | (14.97) | 75.37 | (15.26) |
| Tenant farms (%) | 64.95 | (18.49) | 59.49 | (15.87) | 62.63 | (17.56) |
| Improved acreage in corn (%) | 26.57 | (5.91) | 29.78 | (6.14) | 27.93 | (6.19) |
| Improved acreage in cotton (%) | 36.65 | (16.58) | 33.62 | (13.13) | 35.36 | (15.22) |
| Number of counties | 65 | | 48 | | 113 | |

Notes: Means are reported by whether counties gained or lost state funds after the school census of 1913. Standard deviations are in parentheses. All monetary figures are in nominal cents. A dark gray background denotes the difference in means across groups is statistically significant at the 99-percent confidence level.
Source: Calculated from Haines and ICPSR (2010).

Table 13: Robustness of Estimated Effects of Budget Shocks on Instructional Expenditures per Pupil by Race, 1912–1914

| | All | | | Losers | | | Gainers | | |
|---|---|---|---|---|---|---|---|---|---|
| | (1) Black | (2) White | (3) Difference | (4) Black | (5) White | (6) Difference | (7) Black | (8) White | (9) Difference |
| $\Delta Approp\ PP_t$ | 0.075 | 1.169*** | -1.095*** | 0.025 | 1.392*** | -1.367*** | 0.231 | -0.327 | 0.558 |
| | (0.08) | (0.21) | (0.22) | (0.10) | (0.27) | (0.27) | (0.16) | (0.53) | (0.54) |
| R-squared | 0.350 | 0.409 | 0.314 | 0.531 | 0.575 | 0.504 | 0.309 | 0.126 | 0.163 |
| Counties | 113 | 113 | 113 | 65 | 65 | 65 | 48 | 48 | 48 |

Notes: Standard errors are reported in parentheses. All monetary figures are nominal. "Losers" are counties whose appropriations from the state decreased following the school census of 1913, while appropriations for "Gainers" increased. All specifications include controls for lagged trends in enrollment, local tax revenues, and percentage of African-American children in the school-age population. Additionally, all regressions include controls for pre-shock county characteristics from the 1910 United States Census listed in Table 12. *** p<0.01, ** p<0.05, * p<0.1.