

Shortchanging Disadvantaged Students: An Analysis of Intra-district Spending Patterns in Ohio

*Matthew J. Carr, Nathan L. Gray and Marc J. Holley
University of Arkansas, Fayetteville*

Abstract

Over the last three decades 45 states have been confronted with school finance lawsuits. This phenomenon has led to a proliferation of school funding equity studies. However, to date, most studies of the equity of state school finance systems have focused on differences in expenditures between school districts. More recent research has found evidence that this approach overlooks important allocation decisions made at the district level, thus failing to identify continuing inequity. The few studies that have examined intra-district spending have only focused on a few, large metropolitan districts. This study expands on that work by analyzing how 70 high-poverty districts across the state of Ohio, regardless of urbanization level, distribute resources among individual schools. The results indicate that state funding equity efforts are being contravened by districts and the way that districts allocate their funds to individual schools. Specifically, we find evidence that a vast majority of high poverty school districts are distributing resources inequitably among schools. This may help to explain the disconnect between increased supplemental funding for disadvantaged students in the state and the persistence of the achievement gap despite it.

Introduction

Over the last three decades 45 states have been confronted with school finance lawsuits (National Access Network, 2001). In most states these lawsuits have led to increases in spending to address equity concerns, which have balanced the amount of per pupil spending among districts. Most studies of equity in school finance analyze spending at the district level (e.g., Flanagan & Murray, 2004; Imazeki & Reschovsky, 2004; Ko, 2006). In his study of

funding reform in Missouri, Ko (2006) used the equity statistics that have become the standard school finance equity measures – i.e. “range, restricted range, coefficient of variation, federal range ratio, Gini coefficient, and McLoone index” (p. 559). Although these measures can illuminate a state’s equity status at the district level, the problem is that the resulting conclusions do not reveal anything about spending at the building level. Without analyzing building level spending patterns within districts, claims about improvements in spending to enhance the educational access for traditionally-disadvantaged groups are misleading. The point is that state equity efforts can, and often are, undermined by the way that districts allocate their funds to individual school buildings.

Ohio is one such state to be faced with equity and adequacy lawsuits. The now infamous series of *DeRolph* cases, which were decided by the Ohio Supreme Court, initially declared that Ohio was in violation of the state constitution because resources were not being distributed equitably among the 600+ school districts across the state (*DeRolph v. State*, 1997). The court also addressed the question of whether there were sufficient funds to provide every student with an “adequate” education. Hanushek (1996) notes, “Today, school finance is synonymous with court action to alter funding systems or, at times, state legislation designed to deal with past or prospective court actions about funding patterns” (p. 20). Ohio has been no exception to this observation.

It is important to distinguish and define the two related concepts that are typically the grounds for school finance litigation: adequacy and equity. Adequacy refers to the goal of ensuring that every student has at least the minimum resources necessary to receive some predetermined level of education - an excellent education, an average education, or a basic education (Berne & Stiefel, 1999).

According to a report produced by the Blue Ribbon Task Force on Financing Student Success (2005), in Ohio, adequacy goals are achieved “by taking the average base costs of school districts deemed as high-performing... defined as those districts meeting 20 out of 27 academic standards” and calculating the average per pupil spending in those districts (p. 14). The state then guarantees through the foundation funding program that districts receive at least that base, or “foundation”, amount for every student enrolled. In the most recent school year the foundation amount was \$5,283 per student (Ohio Department of Education, 2005).

Equity in school funding is a more difficult notion, as there are three concepts at work (Berne & Stiefel, 1999; Warner-King and Smith-Casem, 2005). Horizontal equity refers to the equal treatment of equals. This concept refers to whether students with similar needs receive similar resources. If similar students in different areas of the state receive different amounts of funding, then there is reason to believe that horizontal equity is not being addressed.

Vertical equity considers whether different students receive different levels of resources. The central concept of vertical equity is that students with greater needs should receive greater resources than others (Rodriguez, 2004). When states attempt to provide extra resources for economically-disadvantaged students, the intent is to address vertical equity.

A third concept, which is related to both horizontal and vertical equity, is fiscal neutrality (Baker & Green, 2005). This concept holds that the amount of resources a student receives should not be substantially related to the local revenue capacity of the area in which the student lives.

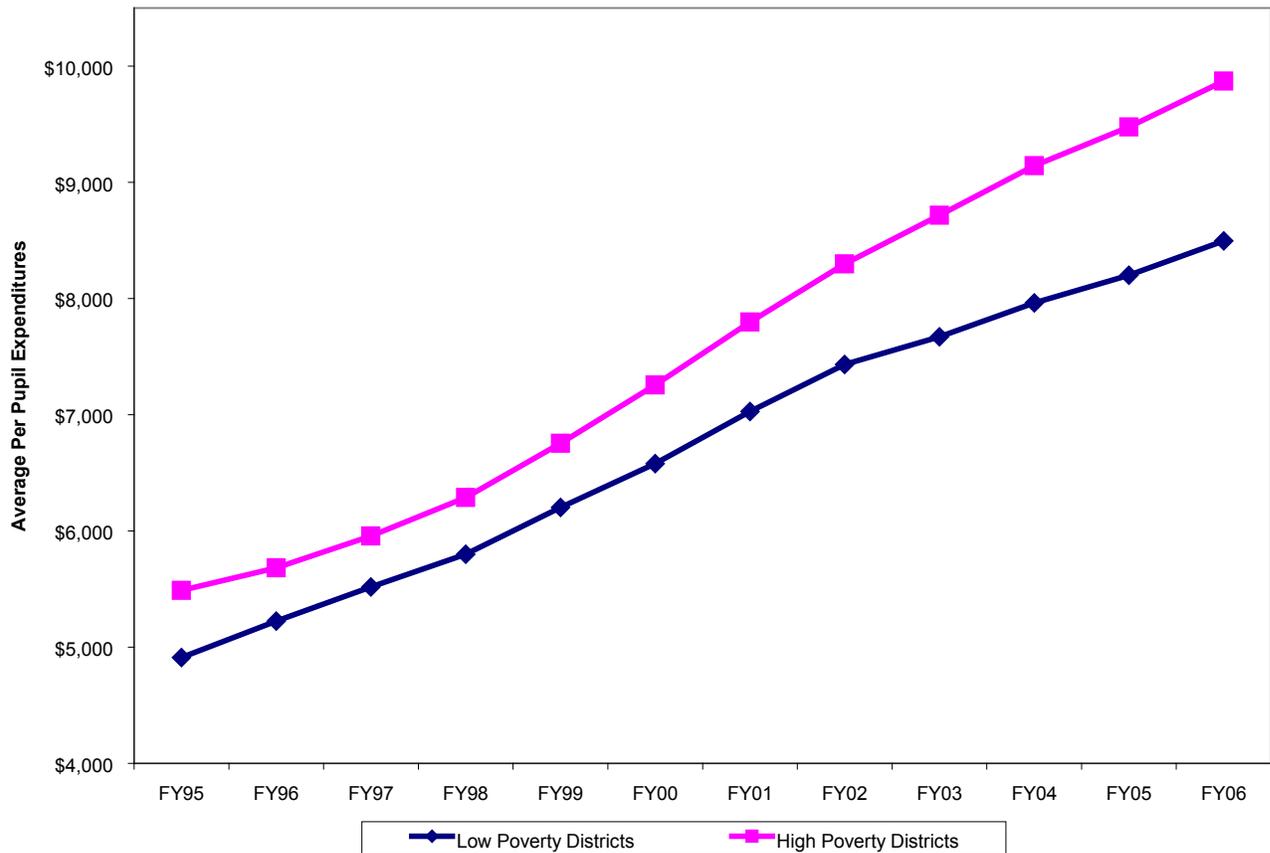
In response to concerns over shortfalls in both adequacy and equity, Ohio policymakers have made substantial changes to the way school districts are funded. By adding more money to the education budget and by recalibrating the funding formula that dictates the distribution of state aid, the state has made efforts to bring all schools up to a certain level of funding and to provide additional funds for special categories of students.

Categorical spending, which takes its name from the fact that students with different needs fall into different groups, is supplementary per pupil spending over and above the foundation amount. This extra funding is intended to provide supplementary resources for students with differential needs, such as those students labeled as economically disadvantaged or special needs. Figure 1, which shows the average spending levels of high and low poverty school districts since 1995, indicates that not only do high poverty districts have higher average per pupil expenditures, but that over time the difference in average expenditures has grown – in favor of the high-poverty districts. This disparity in spending in favor of high-poverty districts would appear to be solving the problem of school funding inequities, but the evidence in this paper suggests otherwise.

One of the reasons that school finance has remained such a central issue in the state is the continued poor performance of high-poverty schools. Despite prolonged legislative activity to close the achievement gap, the

Figure 1

Average Per Pupil Spending for High and Low Poverty Districts, 1995 to 2006



dramatically unequal academic performance of white and minority students and of property-rich and property-poor school districts remains. The gap in reading proficiency levels between non-disadvantaged and disadvantaged districts has continued to be approximately 20% between the years of 1999 and 2006. The same is true for math scores during the same time period, as the gap has remained at approximately 25%.

In particular, this lack of progress in closing the gap between groups is all the more confounding given the steady increases in overall funding to the system, adding nearly two billion dollars since the first *DeRolph* decision. Although legislative efforts to provide supplemental resources for disadvantaged students are well-conceived, the findings in this report demonstrate that the money earmarked for this purpose is not reaching its target. Our study may help to explain the disconnect between increased supplemental funding for disadvantaged students and the persistence of the achievement gap despite it.

To date, studies of the equity of Ohio's distribution of school funds, such as the "Ohio Legislative Budget Office Report" (2004), have focused on differences in expenditures between school districts. However, a recent report commissioned by the Ohio Department of Education and conducted by Achieve, Inc. (2007), entitled "Creating a World-Class Education System in Ohio" concluded: "Though the State funds districts based on the number and needs of the students in them, districts may—or may not—distribute money in the same way. Districts, especially larger ones, tend to use staffing allocations to distribute funding. However, these allocations are often a result of central office decisions and collective bargaining agreements, which do not necessarily reflect student need" (p. 52).

In response to this problem regarding the unit of analysis (district level versus building level), Roza and Hill (2004) studied the within-district revenue allocation of four major urban school districts: Baltimore City schools, Baltimore County schools, Cincinnati Public schools, and Seattle Public schools. These researchers found disparities in spending among the school buildings within each of the studied districts. In another related study of intra-district spending in Massachusetts' seven largest districts, West and Shen (2003) asserted: "In practice, the level of spending in different schools within the same district may reflect considerations other than the educational needs of the students. An equitable distribution of spending within districts cannot be assumed; it must be assessed empirically" (p. 1). Similarly, Hertert (1996) examined both district and building level funding equity in California. She found that "efforts to equalize the distribution of money alone may be as inappropriate in improving an individual pupil's opportunity to learn as this study suggests focusing on district-level rather than school-level equity may be" (p. 83).

In "Assessing Inequities in School Funding Within Districts" (2002), the Annenberg Institute for School Reform at Brown University presented a method for analyzing within-district resource allocation. This method creates a weighted index score for each school within a district. The weighted index equals a school's actual dollar expenditure amount divided by the weighted "average" expenditure for that school. The calculations necessary to compute the denominator are outlined in their paper and involve multiplying enrollment figures by weighted per pupil expenditures (which are based on student characteristics) and then summing those products. According to the Annenberg

method, schools with weighted averages of 1.0 are receiving their due share according to the characteristics of their students. Schools scoring above 1.0 are receiving more revenue per pupil than they should based on their enrollment, and schools with an index below 1.0 are not being allocated their due. The model used in our study of within-district equity is based heavily on this Annenberg model.

The point of the studies of within-district spending is to evaluate whether the work of state policymakers to support traditionally low-performing students is perhaps being undermined because school districts are not also equitably distributing resources to the actual students for which they are intended. As stated above, the Annenberg Institute at Brown University (2002) has created a research model for evaluating intra-district funding allocation equity. Our report uses a substantially similar tool, modified to accommodate the financial data that is publicly available through the Ohio Department of Education. The specific research question for our paper is: Are school districts with a majority of the student population labeled as disadvantaged allocating resources to school buildings in relative proportion to the needs of the students?

Data

The data in this study were collected from publicly-available Ohio Department of Education (ODE) databases. In order to qualify for inclusion in the study, a district had to have at least 50% of students labeled as disadvantaged in the 2005-06 school year. Using this cutoff allowed for a sufficiently large sample size and for ample variation in the sample to conduct statistical analyses. The use of purposive sampling based on this criterion also improves the generalizability of the results to high-poverty schools, which are the specific population of interest. Previous studies, such as Roza and Hill (2004), have focused only on major urban school system. The advantage of our analysis is that it includes all high-poverty school districts regardless of urbanization level. In Ohio, 72 districts met the selection criterion.

Table 1 shows the descriptive statistics concerning revenue and expenditure for the districts in the sample, and Table 2 provides descriptive statistics for district enrollment. These tables illustrate the variation of the districts in the sample.

Table 1

District Level Descriptive Statistics for Revenue and Expenditures

\$	N	Minimum	Maximum	Average
District Expenditure	72	416,690	130,204,916	9,863,965
Sum of District Expenditures	72	3,456,781	579,217,584	58,011,613
District Revenue Per Pupil – Local	72	796	10,713	3,318
District Revenue Per Pupil – State	72	2,314	8,238	5,658
District Revenue Per Pupil – Federal	72	472	2,748	1,347

Table 2

District Level Descriptive Statistics for Enrollment

%	N	Minimum	Maximum	Average
District Disadvantaged Enrollment	72	50	100	62
District SPED Enrollment	72	10	28	18
District Gifted Enrollment	72	0	28	10

Detailed financial information used in the study was drawn from several publicly-available reports provided by the ODE. The SF-3 reports, compiled for each school district in the state, allowed for the calculation of how much money each school building should have spent. The per pupil weights for categorical funding were based on the disadvantaged, special education, and gifted categorical allocations used in these reports. These reports include the total amount that each district received from the state, separated into the foundation funding amount and the categorical funding add-ons. The categorical funding amounts included in this study were the supplemental resources for disadvantaged, special education, and gifted students.

Using other ODE databases, additional enrollment and revenue data were gathered, including the designation of revenue received from local, state, and federal sources. Total student enrollment figures were also assembled for each school in the study, and these data were also broken into disadvantaged,

special education, and gifted students populations at the individual school level. Separate databases of student enrollment counts and financial information were aggregated using the unique identification numbers assigned to every school building and district to conduct this analysis. Table 3 provides the descriptive statistics for the school level expenditure data, and Table 4 shows school level enrollment statistics. The purpose of these tables is to show sufficient variation among schools in the sample.

Table 3

School Level Descriptive Statistics Expenditure

	\$	N	Minimum	Maximum	Average
Per Pupil Actual Spent		916	432	60,912	9,596
Per Pupil Should Have Spent (SHS)		904	3,336	17,778	9,224
Difference Between SHS and Actual		904	-48,736	13,190	-226

Table 4

School Level Descriptive Statistics Enrollment

	N	Minimum	Maximum	Average
Enrollment	916	13	2,030	450
Disadvantaged Population %	906	0	100	71
Special Education Population %	908	0	100*	18
Gifted %	908	0	63	10

Note. * At least one school in the sample, Gorman Elementary in Dayton, serves only disabled students.

Perhaps one of the more pervasive misconceptions to clarify is the notion that school buildings within a district all have substantially similar student populations. The descriptive statistics in the previous two tables provide evidence that there is, in fact, significant variation in the poverty levels of school buildings within the same district, even when only selecting districts that have greater than 50% disadvantaged enrollment. In other words, the data show stratification of students based on socioeconomic status within districts,

not just between them. Although the average percent of students classified as disadvantaged within a district had to be greater than 50% for a district to qualify for this study, individual schools within high-poverty districts ranged from having a disadvantaged enrollment of well below 50% to 100%.

Method

As previously noted, the methodology of this paper relies heavily on the work of the Annenberg Institute for School Reform at Brown University. In “Assessing Inequities in School Funding within Districts” (2002), Annenberg researchers detailed a method of calculating the amount of district funds that ought to go to schools within a given district based on the demographics of the student population in each school. This calculation of what individual schools ought to have received based on the needs of attending students can then be compared to what each school actually spent. Differences between these two figures indicate that the district is not allocating its resources equitably.

The methodology employed in our analysis to calculate the amount of funding individual schools should have received differs slightly from the Annenberg method because of the availability of data. However, the central premise is the same. We approximate what the equitable distribution of district funds to each school (based on the characteristics of the student population) should be and then compare that figure to the actual allocation pattern.

The first step was to determine to what degree districts in Ohio are currently distributing funds to their schools based on the disadvantaged population of each school within the district. Each school’s per pupil expenditure was calculated by dividing that school’s total expenditure by its total enrollment.

Next, Pearson- r correlations between the per pupil expenditure in each school and the percent of students in the building labeled as disadvantaged were calculated for each district. These procedures identified which districts had negative, positive, or neutral correlations between funding level and the proportion of the student body that is disadvantaged. A positive correlation indicates an equitable distribution among schools within the district; in other words, schools with higher proportions of disadvantaged students are spending more, on average, per pupil. Neutral or negative correlations indicate inequity in how a district is allocating its funds. The neutral correlation means that

there is no relationship at all between spending levels and concentrations of disadvantaged students. A negative correlation, though, is the most alarming of all, for it indicates that districts are allocating fewer funds to schools with higher concentrations of disadvantaged students and more funds to schools with less disadvantaged populations.

The next step was to determine how much money schools within a particular district should have spent given the characteristics of their student population. According to Ohio education funding policy, school districts receive basic aid aimed at ensuring that all students receive at least the foundation amount (\$5,283). An important assumption made in the models is that these funds should be distributed equally among all students within districts. The state also then provides additional categorical funding for each student who is designated as disadvantaged, special needs, or gifted. By allotting funds differentially based on perceived need, the state formula intends to create greater equity in the resources available to individual schools. However, the budgeting process dictates that per pupil revenues be channeled through the districts. The question then is whether the additional funds that are designated for these categories of students are actually being passed on by districts to the school buildings which those students attend. If the district is passing on these categorical funds, school buildings within a given district with higher percentages of disadvantaged students should have greater per pupil spending than schools in that same district with lower percentages of disadvantaged students.

Based on the amount the district had previously distributed to schools, the data were used to calculate the amount that each school should have spent per student. Our methodology did not add any money to districts' revenues; it merely re-distributed the available funding to the schools within each district based on the types of students who attended those schools. Using the existing amount of district revenue and total school expenditures, this study examined the degree to which money targeted for disadvantaged students actually reached those students. The reason for focusing on disadvantaged students is that they are the only group allocated substantial categorical funding with little oversight to guarantee that they actually receive those funds. Special education funds are more likely to be reaching their target because of the legal strength of Individualized Education Plans, and gifted education funding is negligible compared to the other categories and total spending.

The calculation of how much each school should have spent was based on the actual student population in a building and the disadvantaged, special education, and gifted categorical allocations set in the state funding formula, as reported in the SF-3 documents. Furthermore, the methodology assumes that all federal funds are directed to disadvantaged students or disabled students. This assumption is valid because of the degree of oversight employed in the tracking of federal funds that are explicitly designated for disadvantaged and special education students. Disaggregating the proportion of federal funding going to each category was done using a database of federal special education funds for each district. The difference between total federal funding for a district and the amount specified for special education students was taken as the funding for disadvantaged students.

Finally, the distribution of locally-raised funds is assumed to be equal to the “weighted” amount of categorical add-on funds from the state. That is, if the state provides a district with \$100,000 in basic aid and \$20,000 of additional money in disadvantaged aid, the method assumes that the local funds should be distributed in a commensurate manner.

A number of calculations were employed to determine the amount that each school in the sample districts should have spent. Each school possessing disadvantaged, special education, and/or gifted students should have spent an amount above and beyond the district’s foundation amount. The *Assessing Inequities* (2002) report outlined the method for calculating the weighted average expenditure using a three-step method.

- Step 1: Take the total amount the district has for a given category.
- Step 2: Divide by the number of students in the district that fall in that category.
- Step 3: Multiply this result by the number of students in each school that fit that category and repeat for each category.

Based on the Annenberg model, Figure 2 below details how the weighted per school expenditure was calculated in our study:

Figure 2

Calculating What School Buildings Should Have Spent Based on Characteristics of the Building's Actual Student Population

$$\text{Per School Expenditure} = (\text{STUDENT} \times \text{EXPstudent}) + (\text{DIS} \times \text{EXPdis}) + (\text{SPED} \times \text{EXPsped}) + (\text{GIFT} \times \text{EXPgift})$$

where,

STUDENT = total number of students in the school

DIS = number of students in school classified as disadvantaged

SPED = number of students in school classified as special education

GIFT = number of students in school classified as gifted

EXP = the per student amount in the given category

For example, in a given district, suppose that the additional amounts of categorical funding were \$1,000 per disadvantaged student, \$500 for a special education student, and \$250 for a gifted student and that the foundation amount that this district receives per pupil is set at \$4,000. If a school were to have one disadvantaged student, one special education student, and one gifted student, then that school would receive an additional \$1,750 [the calculation is $\$1,750 = (1 \times \$1,000) + (1 \times \$500) + (1 \times \$250)$] above what it would have received had every student been exempt from these categories. For the sake of the example, if this school were to have 3 students total, the total amount the school would have received from the state would be \$13,750 [the calculation is $\$13,750 = (\$4,000 \times 3) + (\$1,750)$]. If, however, a hypothetical school had 100 students, but none of them qualified for categorical funding, our report would state that the school should have spent \$400,000. Finally, if this 100-student school were to have 3 students who qualified for categorical funding, with one in each category, then the school should have received \$401,750.

Based on the new amount the school should have received, a new per pupil expenditure amount was calculated by dividing the total amount of funds the school should have spent by the total student enrollment figure. A second set of Pearson-*r* correlations was then run between the percentage of students labeled disadvantaged in each school and the approximated calculation of what each school should have spent for each district. As with the correlation analysis of the actual spending patterns, large positive correlations would

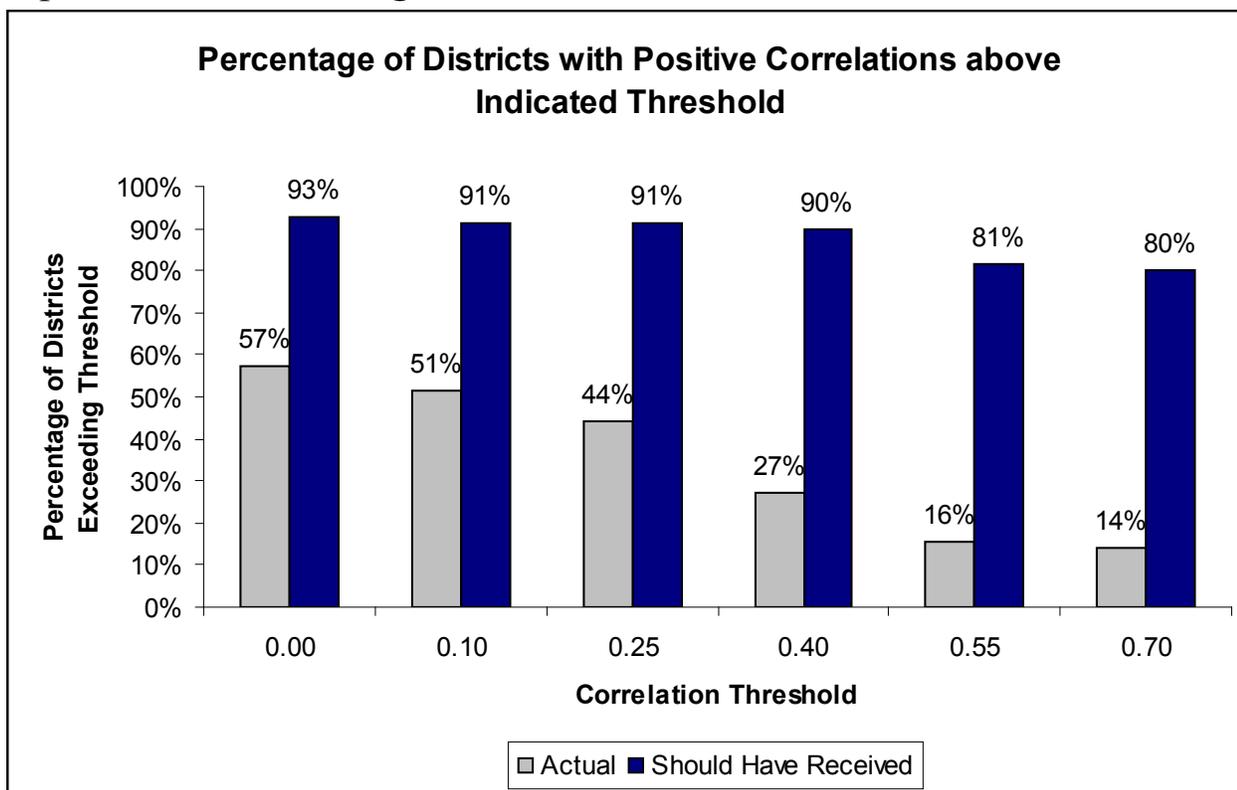
indicate that district resources are being allocated equitably (i.e. based on the characteristics of the students in each school building).

Results

The data analysis suggests that, across the state of Ohio, the actual distribution of funds is not based on the characteristics of the student populations in the respective schools. Figure 3 shows the percentages of school districts with correlations between actual per pupil spending and the percentage of disadvantaged students that are higher than a set of benchmarks. The figure also shows the correlations that would result for districts if they had distributed money in an equitable manner according to state policy. To be allocating resources equitably among its schools - which is to say spending was appropriate for their student populations - a district needs to have a high positive correlation. A correlation that is less than 0.40 is generally considered to be weak (Baldwin, 2007).

Figure 3

Correlations Between Per Pupil Spending and Proportion of Student Population Disadvantaged



Key findings in the analysis were that only 57% of the school districts in the sample had a positive correlation of any magnitude whatsoever and that only 27% had a correlation that would be considered moderate or strong. In other words, only about a quarter of high-poverty school districts in the state are making resource allocation decisions based on the needs of students. These low percentages indicate that an overwhelming majority of districts in Ohio have a strongly inequitable resource distribution pattern.

As indicated in the graph, 57% of districts actually have a positive correlation. Although this figure might appear moderately acceptable, the data indicate that over 40% of students are not receiving their supplemental educational resources even at the lowest threshold of 0.00. As the threshold is raised, the percentage of districts which allocate funds more equitably for disadvantaged students falls. The point here is that there is little indication in these data that actual per pupil spending is positively correlated with the percentage of disadvantaged students in these schools. This finding is particularly troublesome given the fact that, as shown in Figure 1 above, these high-poverty districts are allocated significantly greater revenues than their low-poverty counterparts.

During the 2005-06 school year, the difference between what schools should have received and what they actually spent per pupil resulted in nearly \$300 million being diverted from students who are disadvantaged, in special education programs, or gifted among the 72 schools in this sample. Over 167,000 students attended schools in which funding per student was lower than it should have been based on the number of students who are disadvantaged, and just over 119,000 attended schools in which funding was higher. On average, schools that were under-funded had approximately 76% of their student body labeled disadvantaged, and the average for those that were over-funded was 66%.

Conclusion

Despite the response of the legislature to address the equity concerns raised in the *DeRolph* cases, the analysis in this study suggests that students in Ohio are not receiving funds based on their needs. However, fault for this situation does not lie primarily with the state, but with school districts. The point is that equity created by the state funding formula is contravened by

severe inequity in how districts then allocate resources to their individual schools. Although some may argue that the current K-12 education finance method uses weighted-student funding, a more accurate term to describe what actually occurs would be weighted-district funding. As this study shows, it is districts that are funded based on student characteristics and not individual students. That these high-poverty districts would sue the state claiming that their students are short-changed appears misguided, for it is the districts that are misallocating the money.

If the goal of school finance lawsuits has been to ensure that students receive supplemental education money based on their individual characteristics, then the state and districts must make certain that this extra money actually follows students to their schools. School-based budgeting, rather than district-level budgeting, would, in large part, address this problem. Before asking for more money for disadvantaged students, critics of the current school finance system should first advocate for the appropriate allocation of the large amount of money that has already been authorized. This critical step may well reduce the achievement gap without necessitating putting more funds into the state's public education system. The state should work to make sure that students are getting the resources they have already been designated to receive before diverting more funds into a system that has become highly inefficient.

The obvious question that follows is why districts would have inequity in their schools. After all, they do have incentives, due in large part to the state's accountability system, to improve academic performance and avoid the stigma of poor ratings. Recent research provide some clues as to the likely cause. In particular, the teacher mobility and transfer rights included in collective bargaining agreements appear at least partially to blame.

A teacher's salary is determined in large part by his or her years of experience, and seniority policies often allow teachers to choose their schools of assignment within a district. Warner-King and Smith-Casem (2005) state: "Seniority-based assignment policies allow higher-paid veteran teachers to cluster in schools serving fewer poor, minority, and low achieving students" (p. 12). They assert that it is no surprise that teachers with the most experience and highest salaries choose to work in schools with the most advantaged students. Since 80% of school expenditures are concentrated in salaries, districts are apparently required by collective bargaining agreements to allocate money based on teacher seniority rather than student characteristics (Warner-King & Smith-Casem, 2005).

Roza and Hill (2004) confirmed the hypothesis that more expensive teachers are found in the schools with fewer numbers of disadvantaged students within districts. Because teacher salaries constitute the largest portion of a district's operational budget, Roza and Hill concluded: "Equalizing per pupil spending within districts is necessary, but probably not sufficient. Districts that equalized real-dollar spending among their schools would still find that schools serving poor students had trouble attracting their share of the best-trained and most productive teachers" (p. 218).

The basis for equity lawsuits is that some students need more resources, and the result of these lawsuits should be that students actually do receive the appropriate supplemental amounts. Unfortunately, it appears that the policies arrived at through collective bargaining agreements prevent this equity from happening, and, as a result, disadvantaged students are denied the resources they need.

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