Memorandum

TO :	Members of the House and Senate Committees on Education
FROM:	Rebeca Whorton, Research Analyst
DATE :	February 4, 2014
SUBJECT :	Equity Analysis Report

Equity is a key component of achieving and maintaining a constitutionally sound system of education funding in Arkansas, and has been since Lake View. Judge Kilgore, in his final order on May 25, 2001, declared the current school-funding system to be unconstitutional on twin grounds of inadequacy under the Education Article and inequity under the Equality provisions of the Arkansas Constitution. See Ark. Const. art. 14, § 1, art. 2, §§ 2, 3. 18.

The court put it simply, stating that equity is the funding side of a general, suitable, and efficient system of free public schools. Thus, in order to achieve a constitutional system the state must address both the adequacy and equity provisions embedded within the constitution.

Over the course of litigation in Lake View, the court has acknowledged that equity is not simply a matter of equal distribution of dollars for each child. Equity also must take into account disparities that impact a child's ability to receive an equal opportunity for an adequate education.

In applying various methods for measuring disparities, the Supreme Court upheld Judge Kilgore's 2001 determination that actual expenditures spent on the student, rather than revenues paid to the school districts is "the measuring rod for equality" *Lake View Sch. Dist. No. 25 v. Huckabee*, 251 Ark. 31 (2002). The court has relied on the federal range ratio, and to a lesser extent the coefficient of variation and the Gini coefficient to measure disparities and determine equity.

The Adequacy Study statute (A.C.A. §10-3-2102) requires the Education Committees to "review and continue to evaluate the method of providing equality of educational opportunity of the State of Arkansas and recommend any necessary changes."
This report provides information on the state's educational equity, using standard statistical measures accepted by the court.

Section 1: State Funding Equity

Equity measures involve comparisons of resource distributions of school districts with a goal of equalizing educational opportunities. Briefly, "horizontal equity" refers to the equal treatment of students irrespective of need -- sometimes referred to as the "one scholar, one dollar" principle. "Vertical equity" is aimed at providing additional funding for disadvantaged students to equalize educational opportunities. "Neutrality" measures are designed to indicate inequities resulting from school district wealth or geographic location.

Horizontal Equity

Horizontal equity measures the degree to which districts receive equal shares of resources such as categorical and foundation funding. These equity measures are based on the distribution of resources without regard to district socioeconomic characteristics. The measures used to capture the horizontal equity of state school funding are measures of central tendency, the coefficient of variation, the restricted range, the federal range ratio, the McLoone Index, and the Gini coefficient. A brief description of each of the measures used in the horizontal equity analysis is presented below.

- **Measures of Central Tendency**: The Mean and the Median are the two measures used in this report. The Mean is simply the average of all school districts' unrestricted revenue per pupil. The Median is the mid-point for all school districts' unrestricted revenues per pupil.

- **Coefficient of Variation** is a measure of the inconsistency in funding across school districts in the state. It is computed by dividing the standard deviation (or average differences between districts) by the mean (or average) of funding to all the districts. The value of the coefficient of variation ranges from zero to 1.0. It is difficult to determine an absolute standard as a result of this calculation. However, it is possible to utilize a general acceptable standard of .10, which is a high standard that few states are able to meet. The higher the value of the coefficient of variation, the greater the variation, or level of inequality, that exists in school funding. The coefficient of variation of 0.15 found in this study is within the accepted range of equity.

- **Restricted Range** is the difference between the funding levels found at the highest and lowest spending school districts in the state. The restricted range is calculated as the difference in 95th and 5th percentiles, which eliminates the "outliers," or the top and bottom 5%.

- **Federal Range Ratio** is the restricted range divided by the distribution value at the district in the 5th percentile. This measure allows us to see how much larger the 95th percentile spending is than the 5th percentile spending. The smaller the value of the federal range ratio shows a narrower gap between the lowest and highest spending districts.

- The **McLoone Index** measures the bottom half of a distribution to indicate the degree of equality for those schools or school districts below the 50th percentile. The McLoone Index is computed by finding the ratio of the sum of all values below the 50th percentile (or median) to the sum of all observations if they all had the median value. The McLoone Index ranges from zero to 1.0, with 1.0 representing perfect equality. The Index of 0.95 found in this study is considered desirable.

- **Gini Coefficient** is a statistic that measures the inequality of the unrestricted revenues per pupil. A completely equal distribution of funding occurs when the index measure is 0. Most values in school finance are in the 0.1 - 0.2 range. The coefficient of 0.05 seen in this study is considered well within the acceptable range.

Table 1: Horizontal Equity of Unrestricted Revenue Per ADM

Equity Statistic	2011	2012	2013
Mean	$7,679.09	$7,896.00	$7,998.60
Median	$7,493.05	$ 7,752.83	$7,727.73
Restricted Range	$ 2,330.82	$2,486.12	$2,644.28
Federal Range Ratio	0.34	0.36	0.38
Coefficient of Variation	0.11	0.11	0.15
McLoone Index	0.95	0.94	0.95
Gini Coefficient	0.05	0.05	0.06

Note: The revenues used above exclude Desegregation funds

Horizontal Equity analyses, overall, demonstrate that Arkansas school funding is distributed in a comparatively equitable manner. We find that, over the past three years, Arkansas's funding distribution among school districts has remained consistently within the normal range of acceptability according to the various measures of horizontal equity used. The funds analyzed in Table 1 are comparable to "foundation" funds.

The General Assembly created three types of categorical funding (alternative learning environments, English language learners and National School Lunch [NSL] state categorical funding) to provide more resources for students who present greater educational challenges. (The state also provides a fourth type of categorical funding for professional development, which is provided on an equal per-student basis.) When categorical funding is added to the horizontal equity calculations, the measures indicate that categorical funds do not create significant degradation of equity funding in the state. [1]

Table 2: Horizontal Equity of Unrestricted Revenue Per ADM and Categoricals

Equity Statistic	2011	2012	2013
Mean	$8,215.84	$8,460.48	$8,588.15
Median	$8,002.01	$8,250.66	$8,310.41
Restricted Range	$2,766.08	$2,694.19	$2,974.06
Federal Range Ratio	0.38	0.37	0.39
Coefficient of Variation	0.11	0.11	0.14
McLoone Index	0.95	0.95	0.95
Gini Coefficient	0.06	0.06	0.06

Note: The revenues used above exclude Desegregation funds

Fiscal Neutrality

While Horizontal Equity is based on the distribution of funding without considering district socioeconomic characteristics, the Fiscal Neutrality statistics examine the relationship between property wealth and district revenue per pupil. The measures used to capture the Fiscal Neutrality of state school funding are the Wealth-Neutrality Score and Wealth Elasticity.

Wealth-Neutrality Score: This score measures the linear relationship, if any, between property wealth and district revenue per pupil. Correlations vary between 0 and 1, with lower scores reflecting higher neutrality. Due to Amendment 74 of the Arkansas Constitution, which requires the first 25 mills of property tax revenues to be dedicated to schools, this specific score for Arkansas will always be higher than what is considered desirable.

Wealth Elasticity: This statistic measures the percent increase in district revenue with each percentage increase in local property wealth. Small increases are desirable. An elasticity of around 1.0 functions as a standard to determine whether a state system met the fiscal-neutrality standard.

Table 3: Fiscal Neutrality of Unrestricted Revenues Per ADM

Statistic	2011	2012	2013
Wealth-Neutrality Score	0.60	0.70	0.81
Wealth Elasticity	0.12	0.14	0.19

Note: The revenues used above exclude Desegregation funds

The increase in the correlation over the past three years shows that Arkansas school districts are becoming less equitable over time. This will occur when the growth rate in URT is greater than the growth rate in the required state aid and other funding sources, as has been the case over the last few years. The statistical values in tables 3 and 4 increase in the year 2013 because eight school districts were then allowed by court order to keep the revenues from property taxes in excess of foundation funding. Once we remove the eight school districts that are allowed to keep such funds, the correlation falls back to values comparable to previous years.

The wealth elasticity measure is a more precise measure than wealth score because it shows the exact increase in school revenue associated with an increase in property wealth. In Table 4 reflected below, the wealth elasticity measure shows us in 2013 that a one dollar increase in the district property wealth assessment provides an increase of 18 cents in school revenue. This is confirmation that the negative effect of a stronger correlation score is mitigated and neutrality is acceptable.

When categorical funding is added to the fiscal neutrality calculations, the measures decrease, showing that the distribution of categorical funds help increase the "vertical" equity (among demographics) of funding in the state. [1]

Table 4: Fiscal Neutrality of Unrestricted Revenues Per ADM and Categoricals

Statistic	2011	2012	2013
Wealth-Neutrality Score	0.53	0.66	0.79
Wealth Elasticity	0.11	0.13	0.18

Note: The revenues used above exclude Desegregation funds

Section 2: School District Expenditure Equity

This section presents an analysis of the equity of education expenditures per pupil among state school districts for fiscal years 2011, 2012, and 2013. The expenses included in this analysis include all types of expenditures for each district. It should be noted that expenditures resulting from Desegregation funds have also been included in the analysis due to the inability to accurately separate expenses relating to Desegregation funding. For each of the following graphs, the districts were sorted on the variable of interest, then separated into ten decile groups. The equality of education expenses were then compared across deciles of school districts based on district property wealth, percentages of National School Lunch Act (NSLA) students, percentages of minority students, and district size as measured by Average Daily Membership (ADM). The results of this analysis are presented in graphical form below.

Chart 1: Property Wealth Deciles

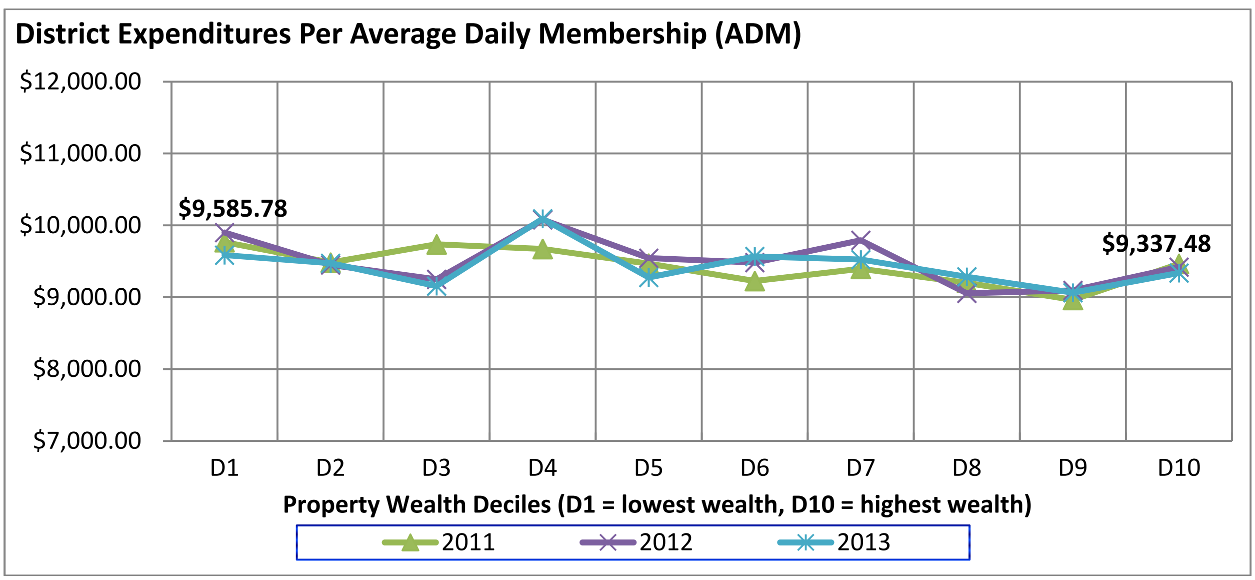


Chart 1 shows expenditures per pupil by school districts organized from low to high on property wealth deciles. The graph shows that the relationship between expenditures per ADM and assessed property values per ADM is relatively small. The district spending is relatively equal across the property wealth deciles. This demonstrates that district spending has very little connection with the property wealth of a district.

Chart 2: Percent of NSLA Student Deciles

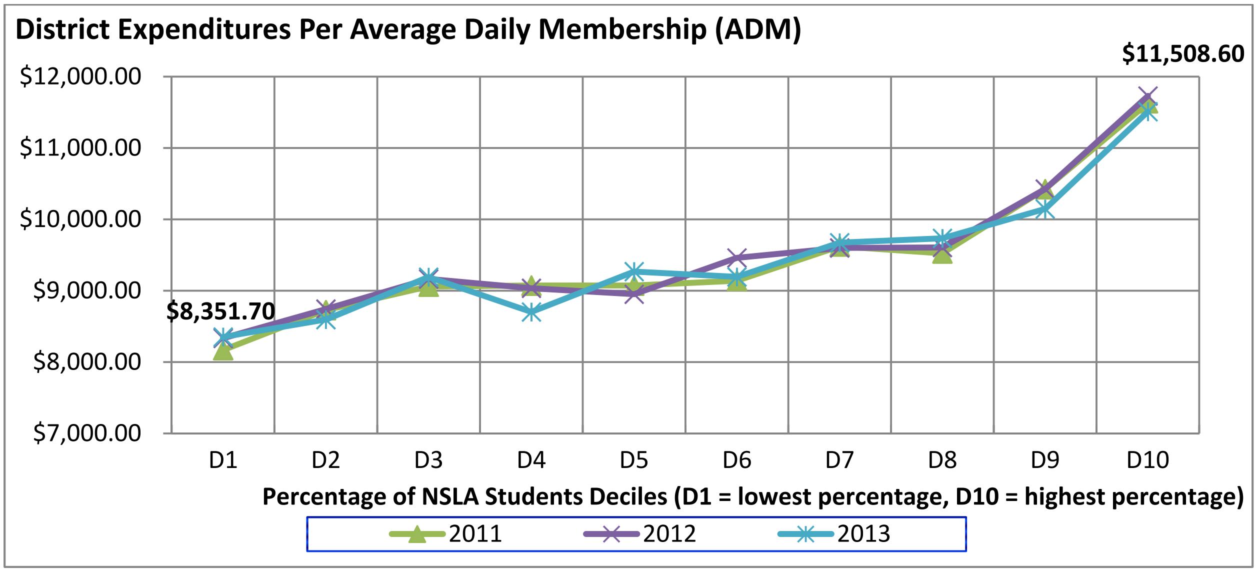


Chart 2 shows that districts with a higher percentage of NSLA population have higher levels of expenditures per pupil than do districts with a lower percentage of NSLA population. The chart indicates that the districts with the highest percentage of poverty students, Decile 10, are spending at the highest levels. The upward trend is apparent in all three years shown above, but has not increased over time.

Chart 3: Percent of Minority Student Deciles

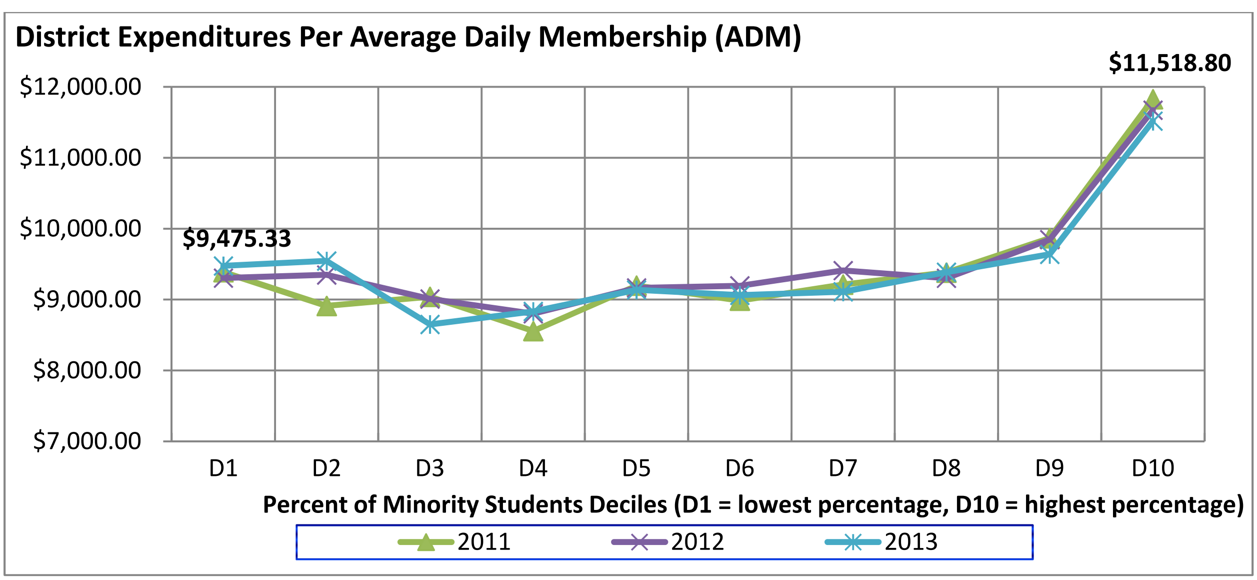
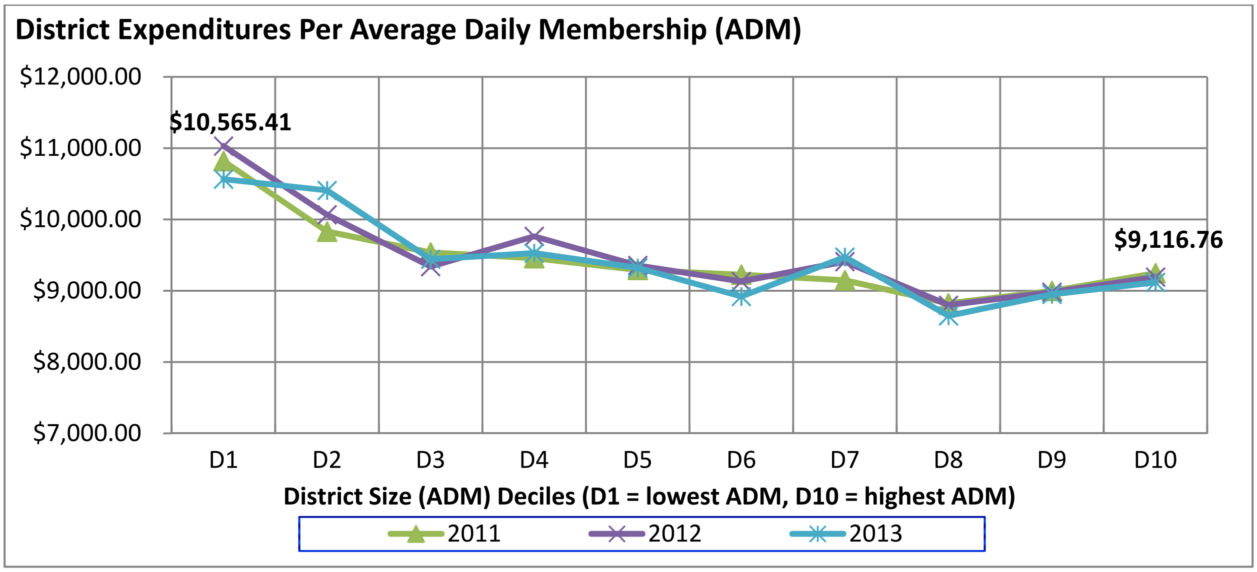


Chart 3 indicates that as the percentage of minority students increases, expenditures per pupil also slightly increase. With the exception of decile 10 (D10), a district's expenditure per pupil is moderately related to the percentage of minority students. The likely reason for the spike in the chart from D9 to D10 is the Desegregation funding for the Little Rock and North Little Rock School Districts.

Chart 4: District Size Deciles



As expected, chart 4 reflects that as the ADM increases the expenditures per ADM decreases. It appears that smaller districts do spend slightly more per student than larger districts. However, as seen in the chart, this difference in expenditures per ADM is small and relatively insignificant.

Conclusion

Among the many issues addressed in Lake View and in the analyses by Picus & Associates, K - 12 funding equity drew much attention. As part of the biennial adequacy study, the Education Committees are required to review the equity measures within the funding of school districts across the state. As reflected through the multiple measures herein, Arkansas's equity statistics indicate a moderate decline in equity scores over the most recent three years but continue to confirm that the qualities in the equity of funding, as well as district expenditures, exist and are holding up well. Due to the Arkansas Constitution requiring priority to school funding with local taxation, there is a high correlation among local wealth and district revenue but this concern is not critical due to the large majority of funding provided from other sources.

As an additional note, the recent distribution of the Quality Counts Supplement for Arkansas (Education Week, January, 2014) provides, among other information, a confirmation of scoring in Arkansas's school finance equity performance measures that surpass the national average.

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(1) The horizontal equity is a measurement of equity among school districts and can be thought of in terms of Arkansas's foundation funding distribution. The statistics are measured before and after the categorical funds are included and no significant degradation or improvement is realized.
The vertical equity is a measurement of equity among demographics (students with different educational needs) and can be thought of in terms of Arkansas's categorical funding distribution. The statistics are measured before and after the categorical funds are included and an improvement is realized.