



Research Report

Arkansas School District Equity Analysis Report

May 8, 2012

Prepared for
The Senate and House
Committees on Education

Table of Contents

CONTENTS

Executive Summary	1
Key Findings.....	1
Section 1: State Funding Equity	2
Horizontal Equity	2
Table 1: Horizontal Equity of Unrestricted Revenue Per ADM.....	3
Table 2: Horizontal Equity of Unrestricted Revenue Per ADM and Categoricals.....	3
Fiscal Neutrality	4
Table 3: Fiscal Neutrality of Unrestricted Revenues Per ADM.....	4
Table 4: Fiscal Neutrality of Unrestricted Revenues Per ADM and Categoricals.....	4
Section 2: School District Expenditure Equity	5
Chart 1: Property Wealth Deciles	5
Chart 2: Percent of NSLA Student Deciles	6
Chart 3: Percent of Minority Student Deciles	6
Chart 4: District Size Deciles.....	7
Conclusion	8
References	9

EXECUTIVE SUMMARY

The purpose of this report is threefold: (1) to examine the equity of both funding and expenditures per student across all school districts in Arkansas, through the use of commonly used Horizontal Equity statistics, (2) to investigate with Fiscal Neutrality measures whether local property wealth determines the equity of funding among these districts, and (3) to analyze the effects of property wealth, poverty level, race, and district size on per student expenditures.¹

KEY FINDINGS

- During the past three years in Arkansas, Horizontal Equity statistics demonstrate a reasonably high degree of equity across all school districts in the state with regards to the distribution of funding.
- Arkansas school districts are treated equitably, regardless of demographics, in terms of funding.
- The categorical funding that is added to compensate for socioeconomically disadvantaged districts contributes to the equalization of revenues in school districts around the state. For instance, the addition of categorical to foundation funds equalizes funding of school districts in Arkansas, irrespective of disparity in property values.
- There has been a slight increase in the strength of the relationship between funding and property wealth of a school district over the past three years; however, there is no evidence of a strong association between expenditures and property wealth across districts.
- Districts with a higher percentage of NSLA students are spending more per pupil than districts with lower percentages of NSLA students. Districts with the highest percentage of poverty have experienced the greatest increase in expenditures over the last three years.
- Expenditures per pupil are only moderately related to the percentage of minority students within a district. Findings show that districts with more minority students spend slightly more per student than districts with a lower percentage of minority students.
- Smaller districts spend slightly more per pupil than larger districts; however, the difference is not significant.

SECTION 1: STATE FUNDING EQUITY

The two primary methodological approaches for determining school finance equity, Horizontal Equity and Fiscal Neutrality, are evaluated by assessing state-level funding for public schools. The first measure presented, Horizontal Equity, can be said to be the overall picture on distributing funds equally among all the school districts in the state. The second measure presented in this report, Fiscal Neutrality, focuses on a district's socioeconomic characteristics and, more specifically, the relationship between a district's property wealth and revenue per student.

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.²

- **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 districts. The value of the coefficient of variation ranges from zero to 1.0. 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 0.11 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.³

- **Gini Coefficient** is a statistic that measures the inequality of the unrestricted revenues per pupil. A completely equitable distribution of funding occurs when the index measure is 0. 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	2009	2010	2011
Mean	\$ 7,478.61	\$ 7,551.74	\$ 7,679.09
Median	\$ 7,296.18	\$ 7,405.52	\$ 7,493.05
Restricted Range	\$ 2,216.78	\$ 2,166.13	\$ 2,330.82
Federal Range Ratio	0.34	0.33	0.34
Coefficient of Variation	0.09	0.10	0.11
McLoone Index	0.96	0.95	0.95
Gini Coefficient	0.05	0.05	0.05

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 has remained consistently within the normal range of acceptability according to the various measures of Horizontal Equity used.

TABLE 2: HORIZONTAL EQUITY OF UNRESTRICTED REVENUE PER ADM AND CATEGORICALS

Equity Statistic	2009	2010	2011
Mean	\$ 7,970.34	\$ 8,062.54	\$ 8,215.84
Median	\$ 7,745.32	\$ 7,842.30	\$ 8,002.01
Restricted Range	\$2,250.89	\$ 2,656.58	\$ 2,766.08
Federal Range Ratio	0.32	0.37	0.38
Coefficient of Variation	0.09	0.10	0.11
McLoone Index	0.97	0.96	0.95
Gini Coefficient	0.05	0.05	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 measure shows whether there is a linear relationship between property wealth and district revenue per pupil. Correlations vary between 0 and 1, with lower scores being more 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.⁴

TABLE 3: FISCAL NEUTRALITY OF UNRESTRICTED REVENUES PER ADM

Statistic	2009	2010	2011
Wealth Score	0.62	0.66	0.60
Wealth Elasticity	0.13	0.14	0.12

Note: The revenues used above exclude Desegregation funds

The decrease in the fiscal neutrality measures in both tables over the course of three years shows that Arkansas school districts are becoming more equitable. The decreasing Wealth Elasticity in both tables shows that the measure of the relationship between local property wealth and district revenue is decreasing. The decreasing Wealth Score measure indicates that less affluent school districts are becoming more likely to have the same resources as wealthier districts.

TABLE 4: FISCAL NEUTRALITY OF UNRESTRICTED REVENUES PER ADM AND CATEGORICALS

Statistic	2009	2010	2011
Wealth Score	0.53	0.57	0.53
Wealth Elasticity	0.12	0.12	0.11

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 2009, 2010, and 2011. 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, National School Lunch Act (“NSLA”) student counts, minority student counts, and district size as measured by Average Daily Membership (“ADM”). The results of this analysis are presented in graphical form below.⁵

CHART 1: PROPERTY WEALTH DECILES

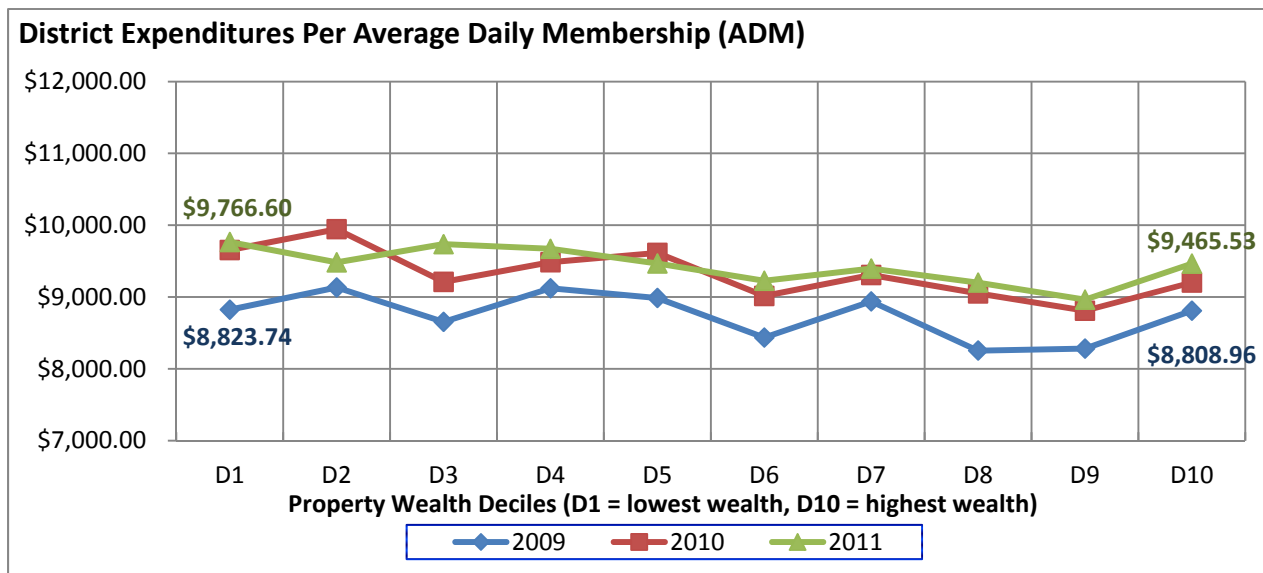


Chart 1 shows expenditures per pupil by school districts organized from low to high on property wealth deciles. The graph shows that the relationship between expenditures and property wealth is relatively small. The district spending is relatively equal across the property wealth deciles. This demonstrates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

CHART 2: PERCENT OF NSLA STUDENT DECILES

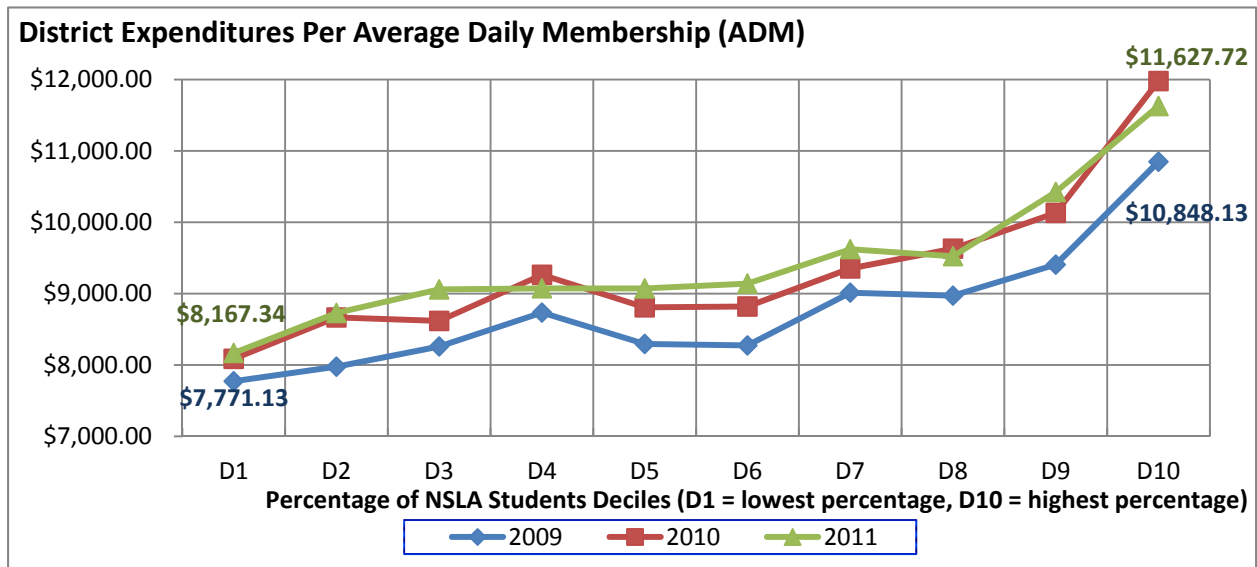


Chart 2 shows that districts with a higher percentage of NSLA population have higher levels of expenditures per pupil than do districts with a lower percentage of NSLA population. The chart indicates that the districts with the highest percentage of poverty students, Decile 10, are spending at the highest levels and have experienced the greatest increases in expenditures. The upward trend is apparent in all three years shown above.

CHART 3: PERCENT OF MINORITY STUDENT DECILES

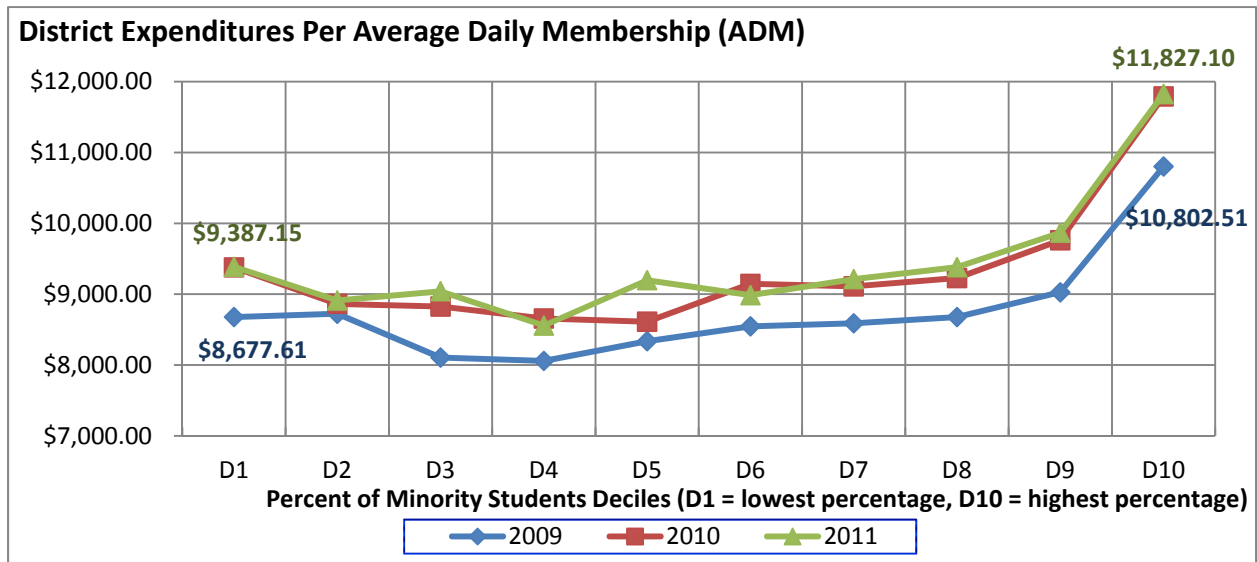


Chart 3 indicates that as the percentage of minority students increases, expenditures per pupil also slightly increase. With the exception of decile 10 (D10), a district's expenditure per pupil is moderately related to the percentage of minority students. The likely reason for the spike in the chart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

CHART 4: DISTRICT SIZE DECILES

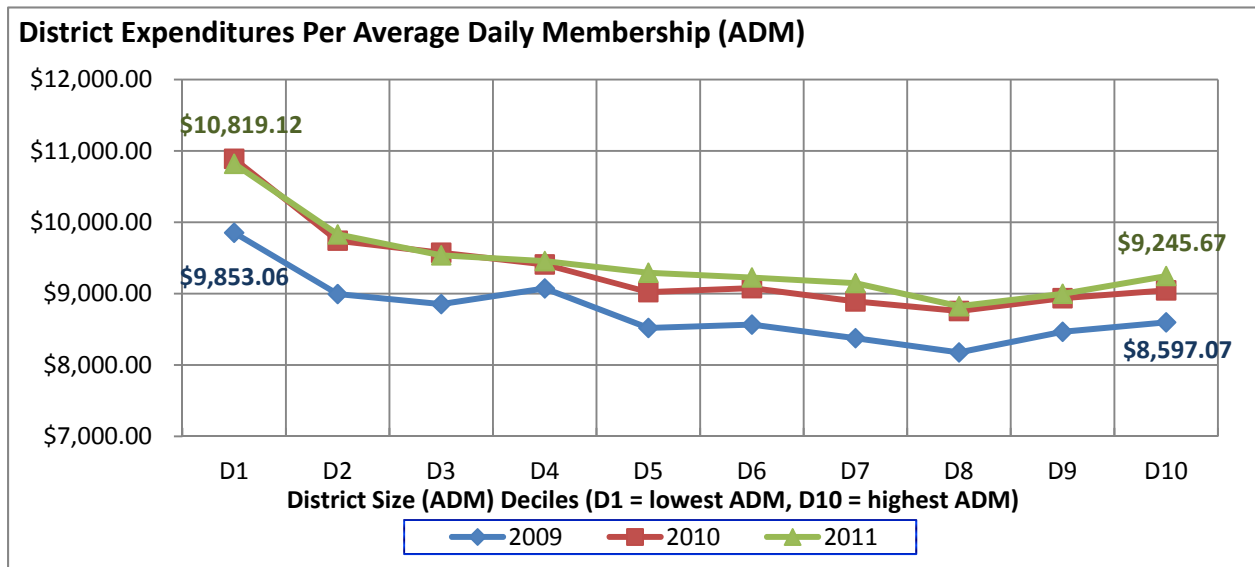


Chart 4 demonstrates that expenditures per average daily membership are relatively flat for the past three years. This indicates that there is not a big difference between the size of the school district and its expenditures. It appears that smaller districts do spend slightly more per student than larger districts. However, as seen in the chart, this difference in expenditures per ADM is small and relatively insignificant.

CONCLUSION

The findings of this equity analysis report indicate that there is a high level of equality in the distribution of state educational funding among Arkansas's school districts. Furthermore, categorical funding plays a significant role in equalizing Arkansas's funding across school districts with varying socioeconomic characteristics. An analysis of school district expenditures indicates that property wealth spending per pupil is relatively equal across districts and is not more than tangentially related to the property wealth of the school district. Findings indicate that districts with a higher percentage of NSLA students are spending more per pupil than districts with lower percentages of NSLA students. Districts with the highest percentage of poverty have experienced the greatest increase in expenditures over the last three years. In addition, the analysis of school expenditures reveals that expenditures per pupil are only moderately related to the percentage of minority students within a district. Findings show that districts with more minority students spend slightly more per student than districts with a lower percentage of minority students. Finally, this analysis shows that smaller districts spend slightly more per pupil than larger districts; however, the difference is not significant.

REFERENCES

¹ "School Finance Equity Statistics." (2007). Consortium for Policy in Education at the University of Wisconsin-Madison. <<http://cpre.weruw.org/finace/equitystats.php>>.

² Arkansas Bureau of Legislative Research (2010). 2010 Arkansas School District Equity Analysis Report.

³ "School Finance Equity Statistics", *supra*.

⁴ Odden, A. and Picus, L. (2008). School Finance: A Policy Perspective. (4th ed.). McGraw-Hill.

⁵ "2010 Arkansas School Districts Equity Analysis Report.", *supra*.