Research Report

Equity of Revenues and Expenditures in Arkansas School Districts

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Prepared for

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2015-16 Adequacy Study

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HISTORICAL CONTEXT

Equity is a key component of achieving and maintaining a constitutionally sound system of funding education in Arkansas, and has been since the 1983 case *Dupree v. Alma Sch. Dist. No. 30*. The *Lake View* cases reaffirmed this principle. Judge Kilgore, in his final order on May 25, 2001, declared the current school-funding system to be unconstitutional on the 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, and 18. Thus, in order to achieve a constitutional system the state must address both the adequacy and equity provisions embedded within the Arkansas Constitution.

The Court in *Lake View* stated that it is the State's responsibility "to determine whether equal educational opportunity for an adequate education is being substantially afforded to Arkansas' school children", and that "[d]eference to local control is not an option for the State when inequality prevails". *Lake View Sch. Dist. No. 25 v. Huckabee*, 351 Ark. 31, 79 (2002). The Court acknowledged that equity is not simply a matter of equal distribution of dollars for each child, but rather the State must take into account disparities that impact a child's ability to receive an equal opportunity for an adequate education.

In measuring these disparities, the Court noted that the "focus for deciding equality must be on the actual expenditures", which are "the measuring rod for equality". *Lake View*, 351 Ark. 31 at 74-75. 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, Ark. Code Ann. §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.

APPROACHES TO DETERMINING EQUITY

In a seminal compendium of existing research, Berne and Stiefel (1984) noted that equity has been conceptualized and measured using three different approaches (Picus, Odden, & Fermanich, 2004; Verstegen, 1996, 2015). "Horizontal equity" analyses examine the degree to which districts receive equal resources on a variable such as categorical and foundation funding. Hence, horizontal equity analyses are univariate, meaning that only one variable is examined (Berne & Stiefel, 1984; Picus et al., 2004; Verstegen, 2015).

In contrast, "vertical equity" analyses involve bivariate statistics that examine one variable (e.g., per pupil expenditures) within categories (or ranges) of another variable, such as National School Lunch (NSL) categories, average daily membership (ADM) groups, racial groups, or amounts of property wealth.

A third approach to equity is the use of "neutrality measures" designed to measure inequities between districts that may arise from differences in local property wealth. Each of these approaches to equity measurement is presented, followed by the results of that respective approach.

Equity is a multidimensional concept that has been analyzed with various statistics that have different purposes, strengths, and weaknesses (Picus et al., 2004; Verstegen, 2013, 2015). These statistics examine different aspects of equity (Consortium for Policy and Research in Education (CPRE), 2012).

HORIZONTAL EQUITY STATISTICS

There are six statistics commonly used to measure horizontal equity, or equal distribution of resources to every school district. The statistics that examine the extremities (or lowest and highest values) are the restricted range and federal range ratio.

RESTRICTED RANGE AND FEDERAL RANGE RATIO

The "restricted range statistic" is restricted to the difference between the per-pupil revenue at the 5th percentile and the 95th percentile to eliminate "outliers" or anomalies that skew (or distort) results. The restricted range provides a limited measure of inequalities among districts because it indicates the difference only between the two extremes – top and bottom – of a distribution of revenue amounts. It does not provide information about differences or inequities among other districts. Furthermore, all range statistics can be influenced by extraneous factors such as the economy and state characteristics (Picus et al., 2004; Verstegen, 2015).

To address the influences of the economy and state characteristics the "federal range ratio" was devised, which is the restricted range divided by the value at the 5th percentile. Although this ratio does eliminate the influences of the economy and state characteristics, it is still based on only the two extreme values of the distribution of revenue differences between school districts (Verstegen, 2013, 2015).

STANDARD DEVIATION

A very common statistic that examines the differences in revenue between all districts is the standard deviation (SD). It is the square root of the sum (Σ) of squared differences between districts' revenues and the mean (μ) divided by the number (N) of districts (Berger, 2001).

$$SD = \sqrt{\Sigma (x - \mu)^2 / N}$$

The standard deviation is basically the average deviation or difference in revenue between districts. It is particularly useful because it places all variables, irrespective of original scale, on the same standard scale (i.e., a SD of 1 or 2 is the same for an IQ scale (20-200) as for a scale that has only 5 points). SDs allow comparisons across variables with different scales, economies, and state characteristics.

COEFFICIENT OF VARIATION

A third horizontal equity statistic, coefficient of variation (CV), examines the differences or variation in revenue among all school districts, and it is not influenced by the economy or characteristics of a state. Mathematically, the CV is the standard deviation divided by the average (or mean) revenue distributed to districts.

The CV can be expressed as a decimal or percentage, and it is the percent of variation surrounding the mean or average revenue distributed to districts in the state (Schay, 2007). Picus et al. (2004, p. 16) state, "Determining a standard for the coefficient of variation is a value judgment." They concluded, "….different states…..might reasonably set different levels as an acceptable coefficient of variation." They used a standard of 0.10 or less, but they also clearly noted that it was a high standard that few states achieve.

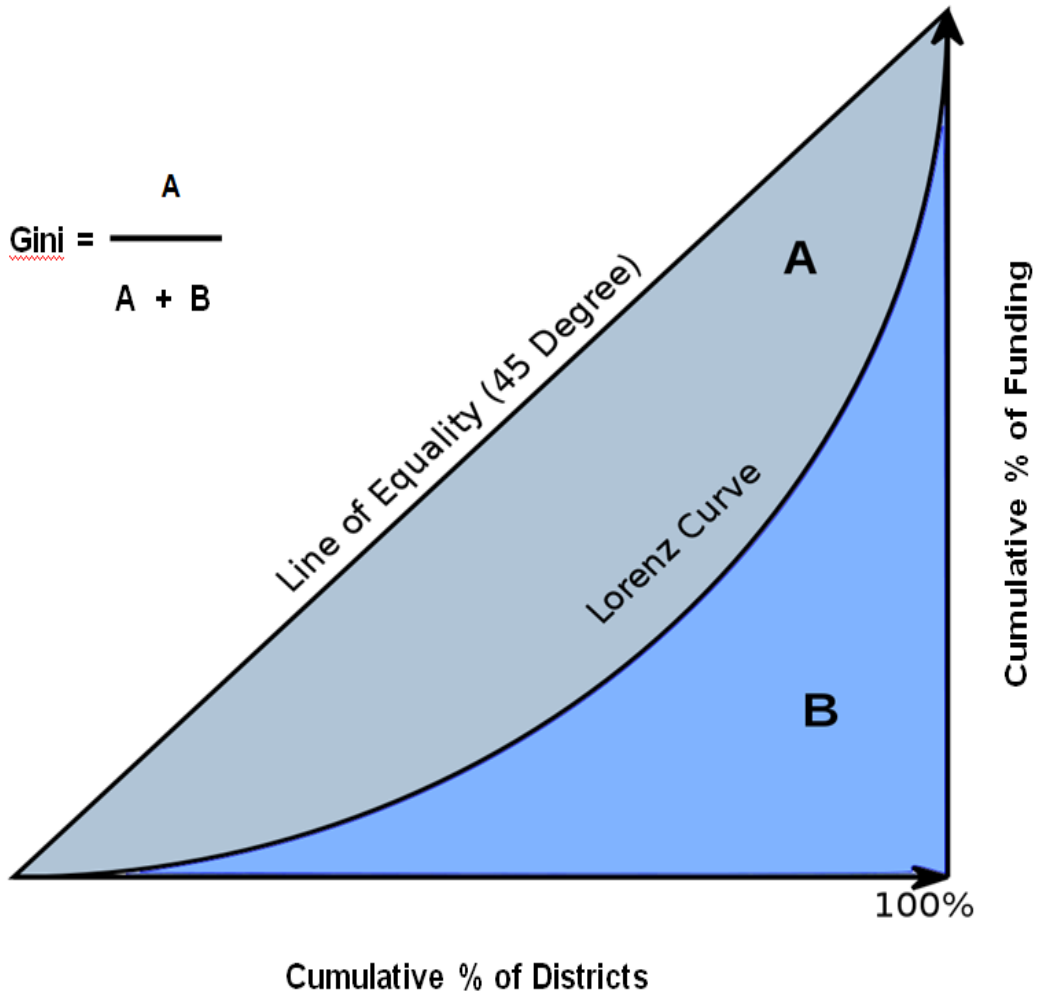
GINI COEFFICIENT

Another popular equity statistic in the school finance literature is the Gini Coefficient (GC). Its coefficients range from 0 to 1, with a completely equitable distribution represented by zero (Odden & Picus, 2013, Verstegen, 2015). The GC also examines differences in revenue between all districts, and it is unaffected by extraneous factors like the economy and state characteristics.

To determine the GC, a graph is created by plotting the cumulative percentages of all districts' total revenue on the vertical axis and the cumulative percentages of the number of districts on the horizontal axis. The resulting graph indicates the degree to which revenue is distributed equally to districts at various percentiles. If the revenue distribution is perfectly equitable, the graph would be a straight 45 degree line. Perfect equity occurs when the cumulative percentage of districts equals the cumulative percentage of funding (e.g., 20 percent of districts receive 20 percent of the revenue).

If the distribution is less than perfect, the graph will be a concave Lorenz curve (area A, in Chart 1). The GC is the area between the Lorenz curve and the 45 degree line divided by the area under the 45 degree line (area B), or A/A + B. A GC of 0.10 or smaller is desirable (Picus et al., 2004; Verstegen, 2015).

Chart 1. Example of Lorenz (or Gini) Curve



MCLOONE INDEX

Another popular equity measure, the McLoone Index, is the ratio of the sum of per-pupil revenues for all districts below the 50th percentile (or median revenue) to the sum of the same districts if their revenue equaled the median. This index ranges from 0 to 1, with a 1 indicating perfect equality. It shows the percentage current funding is of the revenue needed to bring the bottom half of districts up to the median level of funding. An index of 0.95 or larger is desirable (CPRE, 2012; Picus et al., 2004).

The McLoone Index also is unaffected by the economy and state characteristics, but it considers only districts that fall below the median revenue for all districts.

DATA FOR HORIZONTAL EQUITY STATISTICS

There are two revenue variables analyzed to examine horizontal equity. The first variable is "foundation funding and property taxes per-student." This is district revenue made up of all components of foundation funding (the revenue generated by the Uniform Rate of Tax [25 mills], state foundation funding aid, the 98% URT Actual Collection Adjustment, and other miscellaneous funds). This revenue also includes other local millage raised above the first 25 mills. To eliminate the effect of temporary increases or decreases in revenue due to capital projects (debt service millage), tax revenue used to service construction debt was excluded (though debt service millage in excess of each district's debt service payment was included). The revenue was divided by each district's prior year ADM.

The second variable is "foundation and other adequacy-related funding per-student." This revenue consists all of the revenue included in the first variable, plus selected types of state funding. The selected state funds include:

- National School Lunch state categorical funding,
- English language learner funding,
- Professional development funding,
- Alternative learning environment funding,
- Student growth funding,
- Declining enrollment funding,
- Isolated and special needs isolated funding,
- Special education catastrophic occurrences funding.

This revenue was divided by each district's prior year ADM.

RESULTS OF HORIZONTAL EQUITY STATISTICS

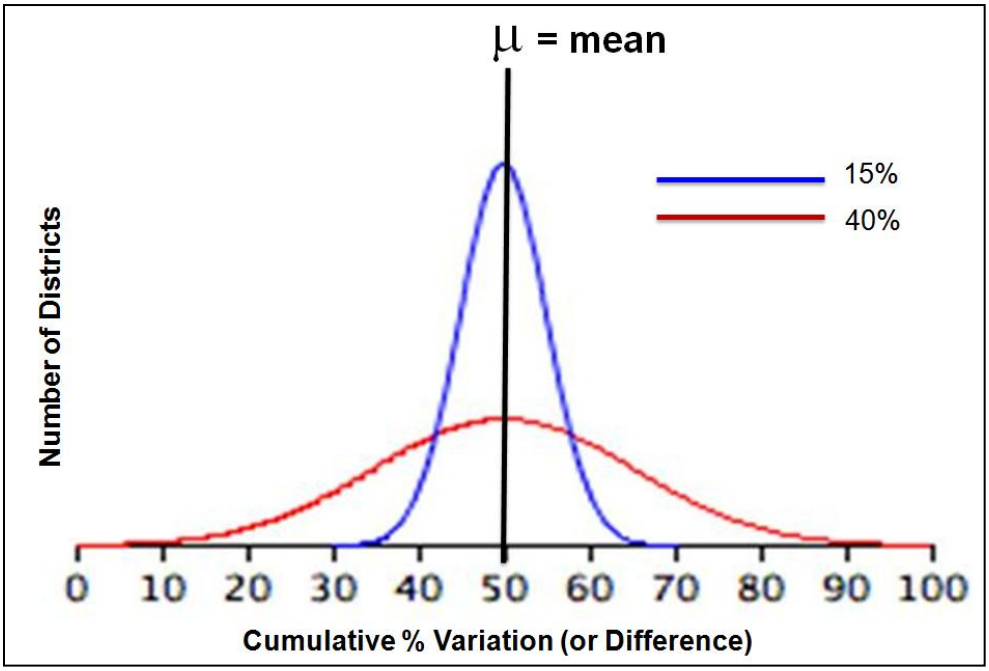
The statistical results for the first variable measuring horizontal equity are shown in Table 1. The measures of central tendency, mean and median, reflect the inflation adjustment of around 2% made each year. The mean is the arithmetic average, and the median is the middle funding value (or 50th percentile). The restricted ranges between the 5th and 95th percentiles indicate some widening between 2013 and 2014, and narrowing between 2014 and 2015. The federal ratio is calculated by dividing the restricted range by the funding at the 5th percentile. The ratios shown are a little higher than the preferred 0.25 designated by Verstegen (2015). However, this ratio is a very limited measure of equity because it only considers the difference between the 5th and 95th percentile values.

The standard deviation seen in Table 1 is the average difference in funding between districts, and when this figure is divided by the mean, the variation around the mean is less than 20%. In other words, the overall difference in funding between districts has remained less than 20% over the past three years. The CVs shown in Table 1 are a little larger than the standard of .10 used by Picus et al. (2004), however, they indicated that their standard was higher than most states can achieve. Furthermore, Chart 2 provides a visual comparison of coefficients of variation (CV) around the mean of 15% and 40%. It provides a visual example of how narrow the observed distributions are of funding differences between districts in this study.

Table 1. Foundation Funding and Property Taxes per Student

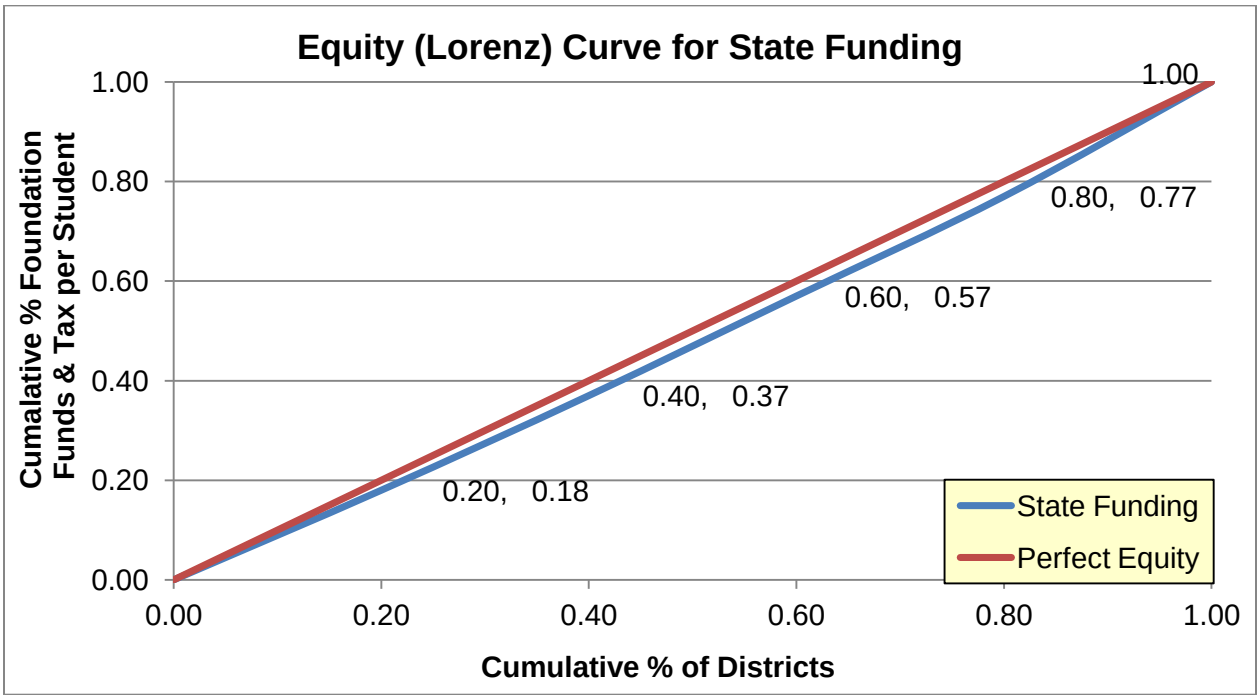
Horizontal Equity	2013	2014	2015
Mean	$6,921.70	$7,097.82	$7,333.49
Median	$6,690.80	$6,846.50	$7,091.44
Restricted Range	$1,818.62	$2,072.56	$1,851.87
Federal Range Ratio	0.29	0.32	0.28
Standard Deviation	$1.125.01	$1,334.05	$1,253.89
Coefficient of Variation	0.16	0.19	0.17
McLoone Index	0.963	0.955	0.963
Gini Coefficient	0.056	0.055	0.056

Chart 2. Example of Coefficient of Variation Distributions



The McLoone Indexes in Table 1 show that the total revenues of districts below the median (or 50th percentile) level of funding are receiving, as a group, at least 95% of the revenue they would receive if all of them were funded at the median level. The Gini Coefficients indicate that the distribution of funding is within 6% of perfect equality. Chart 3 shows the Lorenz (or Gini) curve for foundation funds and property taxes per student. Along the 45-degree line are sets of numbers, the first of which indicates the cumulative percentage of funding expected at each level if there is perfect equity, and the second number in each set is the cumulative percentage found in this study's equity analysis.

Chart 3. Lorenz Curve for % Foundation Funding and Property Taxes per Student



The results from analyses of the second variable measuring funding are shown in Table 2. The measures of central tendency, mean and median, are larger in Table 2 because selected state funding listed in the previous section of the report is added to the first variable analyzed in Table 1. These select state funds represent funding provided to districts to offset disadvantages such as poverty or disabilities. Because the other statistics are very similar to those discussed for Table 1, the specific details about findings are not repeated.

Generally, the conclusion drawn from these horizontal equity analyses is that Arkansas school funding is distributed in an equitable fashion. Over the past three years, the funding distribution among school districts has remained consistently within the accepted levels of equity according to commonly used measures of horizontal equity (Odden & Picus, 2013; Picus et al., 2004; Verstegen, 2015).

Table 2. Foundation and Other Adequacy Funding per Student

Horizontal Equity	2013	2014	2015
Mean	$7,706.64	$7,,878.18	$8,106.74
Median	$7,415.93	$7,659.87	$7,842.60
Restricted Range	$2,390.70	$2,487.43	$2,371.17
Federal Range Ratio	0.39	0.39	0.33
Standard Deviation	$1,125.01	$1,210.55	$1,308.91
Coefficient of Variation	0.15	0.15	0.16
McLoone Index	0.958	0.948	0.954
Gini Coefficient	0.061	0.060	0.060

FISCAL NEUTRALITY STATISTICS

Fiscal neutrality statistics are used to examine the relationships between property wealth per student and the two funding variables analyzed in Tables 1 and 2. Property wealth per student is the total assessment value of property in each district divided by prior year ADM. The assessment value used in this calculation was the amount used to determine state foundation funding aid. For example, the 2013 assessment was used for the 2014-15 funding year.

An equitable distribution of revenue to school districts would indicate a limited if any relationship between property wealth and revenue. The statistics typically used to measure fiscal neutrality are the “wealth-neutrality correlation” and the “wealth elasticity” (Brimley, Verstegen, & Garfield, 2016).

WEALTH-NEUTRALITY CORRELATION

The wealth neutrality correlation is the relationship between property wealth and district per-pupil revenues. Correlations vary between 0 and $\pm$1, with lower correlations indicating less of a relationship between property wealth and district funding and more equity in distribution of revenue.

WEALTH ELASTICITY STATISTIC

The wealth elasticity statistic is a more precise measure than the correlation because it indicates the exact increase in district revenue associated with a dollar increase in property wealth. Ordinary least squares regression (Freund & Wilson, 2006) indicates the percent increase in district revenue with each percentage increase in local property wealth when both variables are expressed as natural logarithms. Logarithms correct for skewed data, but also proportion (percents) increases are more appropriate than linear when the increase has a disproportionate effect on districts. Small or no increases are desirable (Ladd & Goertz, 2015).

RESULTS OF FISCAL NEUTRALITY STATISTICS

Table 3 shows the correlation between per-student property wealth and foundation funding and property taxes, and the regression of the latter on the former (or wealth elasticity measure). The correlation noticeably declined from 2013 to 2014, then rose again in 2015. All three wealth elasticity coefficients are small, indicating that a dollar increase in per-student property wealth is associated with 20 cents or less increase in funding and property taxes.

Table 3. Property Wealth: Foundation Funding and Property Taxes per Student

Statistic	2013	2014	2015
Wealth-Neutrality Correlation	0.85	0.83	.89
Wealth Elasticity	0.000*	0.18	.20

*Note: *The coefficient is 0.000002*

Almost identical correlations (or relationships) are observed between per-student property wealth and foundation and other adequacy-related funding per student. Likewise, the elasticity coefficients indicate small increases (< 20 cents) in funding associated with each dollar increase in per-student property wealth.

Table 4. Property Wealth: Foundation and Adequacy-Related Funding per Student

Statistic	2013	2014	2015
Wealth-Neutrality Correlation	0.81	0.78	.85
Wealth Elasticity	0.000*	0.17	.19

*Note: *The coefficient is 0.000002*

Picus et al., (2004) clearly state that large correlations between property wealth and funding are not relevant to policy when wealth elasticity coefficients are small. Statistically, two variables (e.g., property wealth and funding) can be highly correlated because correlation only examines the pattern of relationships between variables. However, the wealth elasticity statistic examines the exact amount of increase in one variable that accompanies each dollar increase in the other variable. This study shows that two variables can be highly correlated, even when neither variable has a large influence on the other.

It should be noted here that there are eight districts in the state in which the uniform rate of tax (URT or first 25 mills) generates more than the foundation funding rate. In most districts, URT generates less money per student than the foundation funding rate. State foundation funding is provided to these districts to ensure that they receive the full $6,521 per student. In 2012, the Arkansas Supreme Court ruled that the eight districts that generate more than the foundation funding rate are permitted to keep all of the money generated by their URT. In effect, this means these eight districts have more revenue than the foundation funding rate set by the General Assembly.

These eight districts have a significant effect on the fiscal neutrality statistics just discussed. Tables 5 and 6 present the statistics with these eight districts excluded from analyses. Comparing the two sets of Tables (3 & 4 with 5 & 6), it may be observed that the wealth-neutrality correlations are significantly lower when these eight districts are excluded, and the wealth elasticity coefficients are considerably smaller (about half). These latter coefficients indicate that both types of funding increase 11 cents for every dollar increase in property wealth per student.

Table 5. Property Wealth: Foundation Funding and Property Taxes per Student

Statistic	2013	2014	2015
Wealth-Neutrality Correlation	0.65	0.59	.71
Wealth Elasticity	0.10	0.10	.11

Note: 8 high URT districts excluded.

Table 6. Property Wealth: Foundation and Adequacy-Related Funding per Student

Statistic	2013	2014	2015
Wealth-Neutrality Correlation	0.50	0.49	.56
Wealth Elasticity	0.10	0.10	.11

Note: 8 high URT districts excluded.

VERTICAL EQUITY STATISTICS

Revenue is usually distributed according to district characteristics, using a mechanism such as Arkansas's funding matrix, and therefore the primary issue is whether funding is distributed equitability between districts. Vertical equity statistics are typically conducted on expenditures to assess the equity in spending according to key district characteristics. The district characteristics addressed in this study are average daily membership (ADM), percent non-white, percent free and reduced-price lunch, and per-student property wealth.

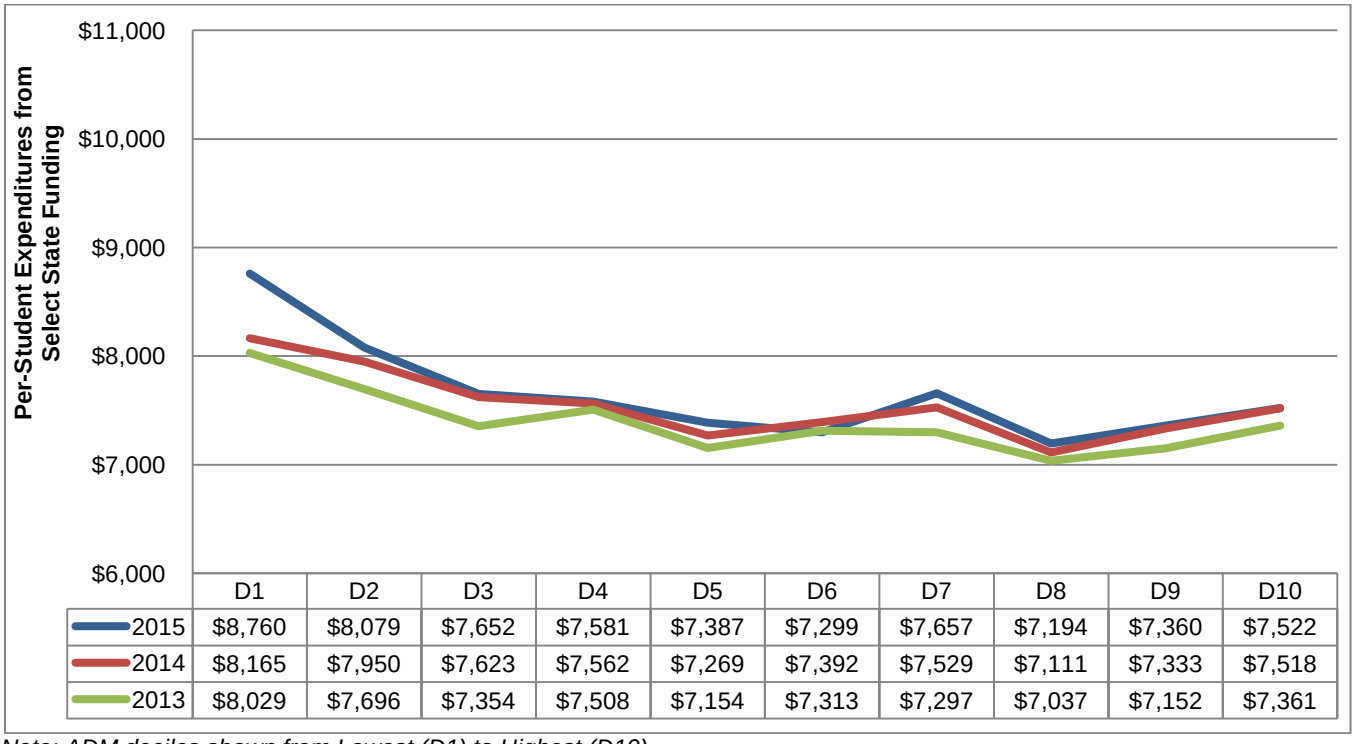
DATA FOR VERTICAL EQUITY STATISTICS

Two variables are examined in relation to district characteristics to determine vertical equity. The first variable is "per-student expenditures from select state funding." These expenditures include only those made using foundation funding, property taxes, and the revenues listed above as "other adequacy-related funding." To eliminate the effect of temporary increases or decreases in expenditures due to capital projects, the expenditures do not include any facilities acquisition or construction, and they do not include debt service payments. These expenditures were divided by each district's prior year ADM. The second variable, "total expenditures per-student," includes all expenditures made using all funding sources (including federal funding). However, expenditures made using desegregation settlement funding were excluded. These expenditures were divided by each district's prior year ADM, and exclude facilities acquisition and construction and debt service payments.

RESULTS OF VERTICAL EQUITY STATISTICS

The first vertical equity analysis (Chart 4) examines the relationship between "expenditures from select state-funding" and ADM. The two most prominent observations are the similarity in levels of expenditures across the three years shown and the slightly higher per-student expenses in the lower two ADM deciles. These findings indicate that there is virtually no relationship (or inequity) between school size (or ADM) and per-student spending, with the exception of observable higher expenditures in smaller districts.

Chart 4. Expenditures from Select State Funding by ADM Deciles

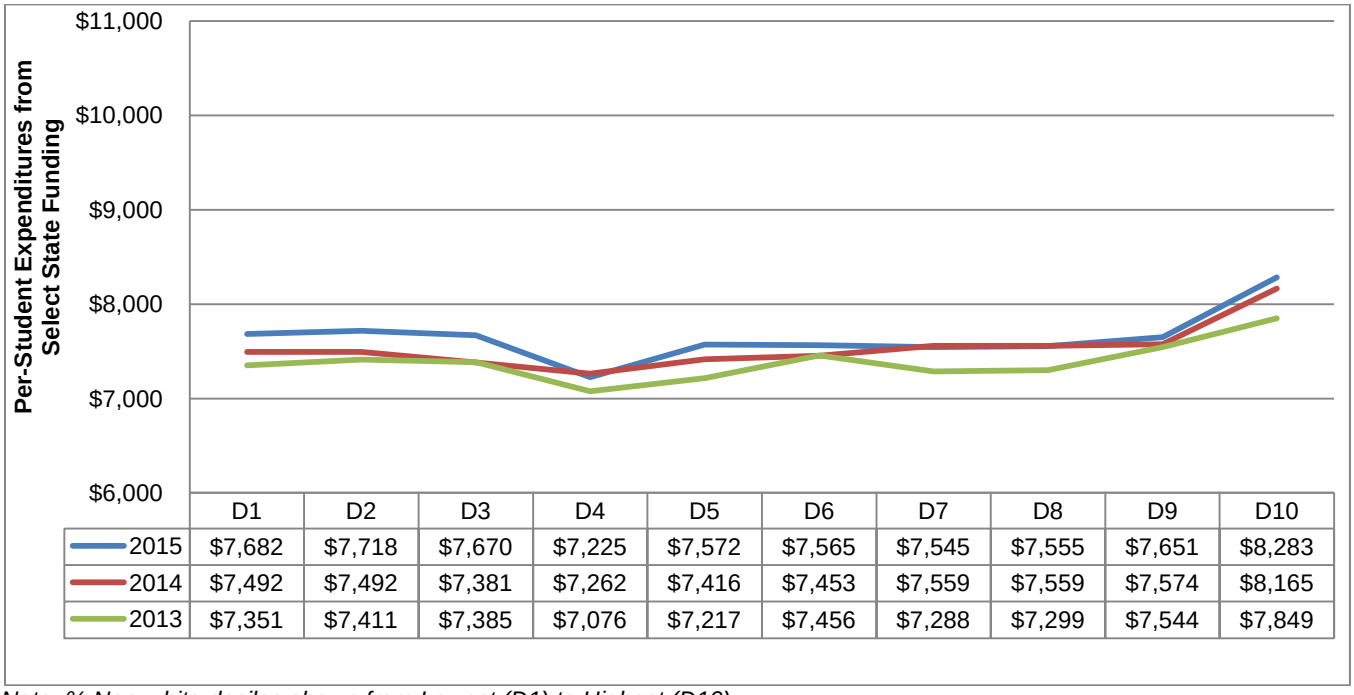


	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
2015	$8,760	$8,079	$7,652	$7,581	$7,387	$7,299	$7,657	$7,194	$7,360	$7,522
2014	$8,165	$7,950	$7,623	$7,562	$7,269	$7,392	$7,529	$7,111	$7,333	$7,518
2013	$8,029	$7,696	$7,354	$7,508	$7,154	$7,313	$7,297	$7,037	$7,152	$7,361

Note: ADM deciles shown from Lowest (D1) to Highest (D10)

Chart 5 indicates that there is a perceptible increase in per-student expenditures in Decile10, or school districts with higher concentrations of non-white students. Otherwise, the spending patterns are fairly similar across the three years examined. The somewhat similar pattern of results in Chart 6, with free and reduced-priced lunch percentages, suggest that Charts 5 and 6 likely represent varied (or derivative) measures of high concentrations of poverty, which require additional expenditures for supplemental programs.

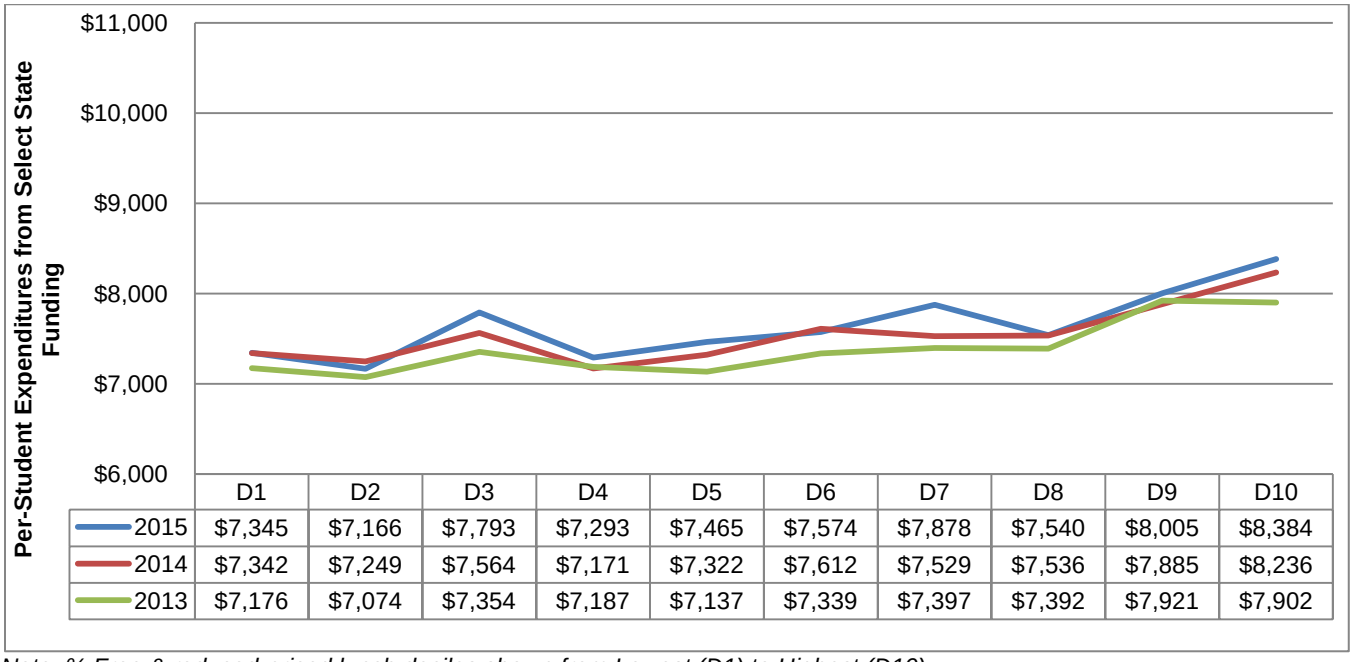
Chart 5. Expenditures from Select State Funding by % Non-White Deciles



	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
2015	$7,682	$7,718	$7,670	$7,225	$7,572	$7,565	$7,545	$7,555	$7,651	$8,283
2014	$7,492	$7,492	$7,381	$7,262	$7,416	$7,453	$7,559	$7,559	$7,574	$8,165
2013	$7,351	$7,411	$7,385	$7,076	$7,217	$7,456	$7,288	$7,299	$7,544	$7,849

Note: % Non-white deciles shown from Lowest (D1) to Highest (D10).

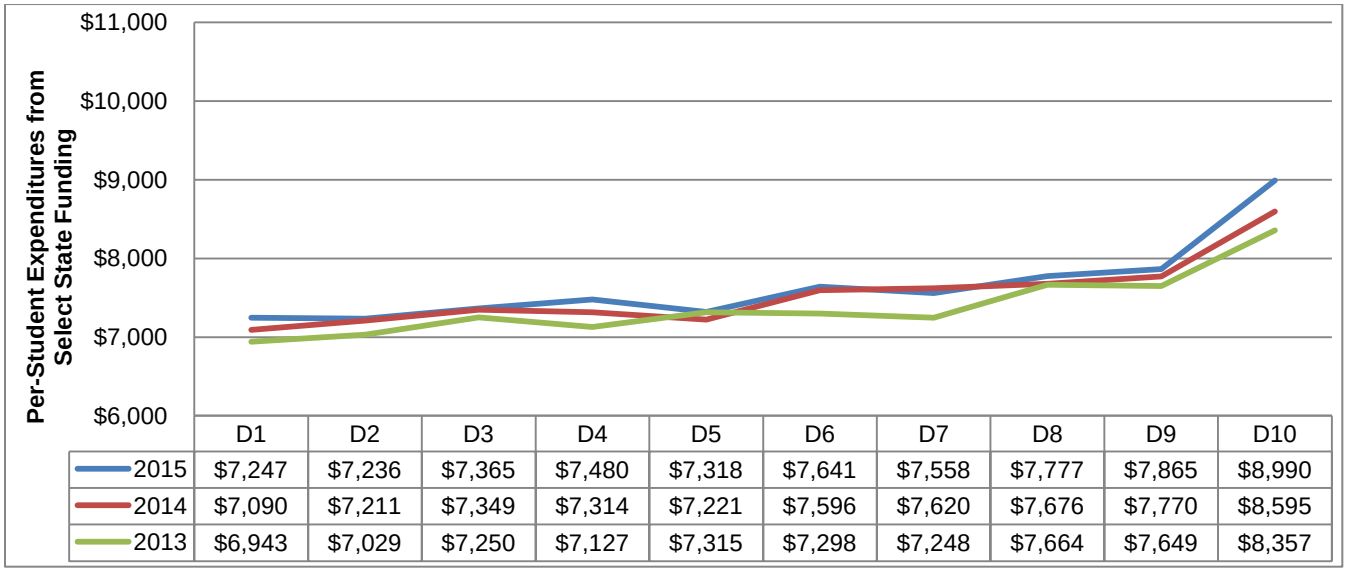
Chart 6. Expenditures from Select State Funding by % Free and Reduced-Price Lunch Deciles



	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
2015	$7,345	$7,166	$7,793	$7,293	$7,465	$7,574	$7,878	$7,540	$8,005	$8,384
2014	$7,342	$7,249	$7,564	$7,171	$7,322	$7,612	$7,529	$7,536	$7,885	$8,236
2013	$7,176	$7,074	$7,354	$7,187	$7,137	$7,339	$7,397	$7,392	$7,921	$7,902

Note: % Free & reduced-priced lunch deciles shown from Lowest (D1) to Highest (D10).

Chart 7. Expenditures from Select State Funding by per-Student Property Wealth Deciles



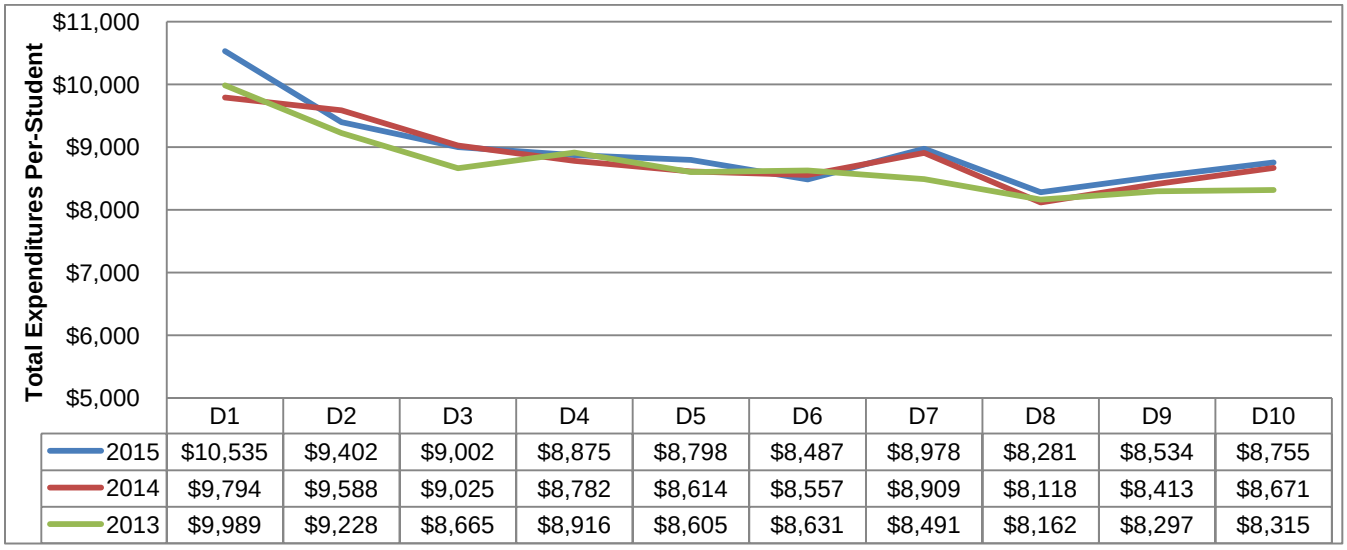
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
2015	$7,247	$7,236	$7,365	$7,480	$7,318	$7,641	$7,558	$7,777	$7,865	$8,990
2014	$7,090	$7,211	$7,349	$7,314	$7,221	$7,596	$7,620	$7,676	$7,770	$8,595
2013	$6,943	$7,029	$7,250	$7,127	$7,315	$7,298	$7,248	$7,664	$7,649	$8,357

Note: Per-Student property wealth deciles shown from Lowest (D1) to Highest (D10).

Chart 7 indicates a consistent pattern of per-pupil expenditures across deciles for all three years until decile10, which represents the districts with the highest property wealth per student. Based on other studies, the higher per-student expenditures in the wealthiest districts are not unexpected. Also, the expenditures are heavily influenced by the eight districts, discussed earlier concerning Tables 5 and 6, in which the URT generates more than the foundation funding rate. There are no clearly established benchmarks for determining equity under such circumstances (Picus et al., 2004).

Chart 8 shows the results of examining the relationship between "total expenditures per student" and ADM. The dollar amounts are naturally higher for total expenditures than for spending from select state funding (Charts 4 – 7), but the pattern of spending according to ADM is similar in both Charts 4 and 8. As expected, smaller districts (Deciles1 and 2) spend a little more per-pupil than larger districts. This finding represents the economies of scale issues discussed throughout the school finance literature (Ladd & Goertz, 2015; Odden & Picus, 2013).

Chart 8. Total Expenditures per Student by ADM Deciles

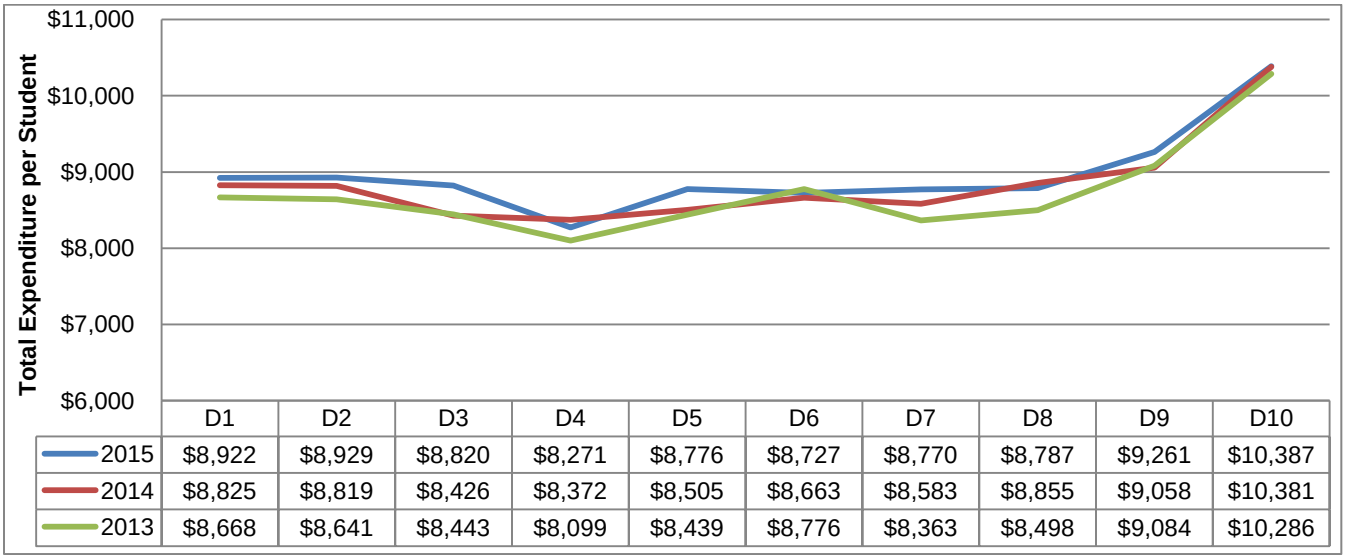


	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
2015	$10,535	$9,402	$9,002	$8,875	$8,798	$8,487	$8,978	$8,281	$8,534	$8,755
2014	$9,794	$9,588	$9,025	$8,782	$8,614	$8,557	$8,909	$8,118	$8,413	$8,671
2013	$9,989	$9,228	$8,665	$8,916	$8,605	$8,631	$8,491	$8,162	$8,297	$8,315

Note: ADM deciles shown from Lowest (D1) to Highest (D10).

Chart 9 has a very similar pattern of results for "total expenditures per student," by percentage of non-white deciles, across all three years as shown in Chart 3 for "expenditures from select state funding." The primary differences in results between these two charts are the dollar amounts, which obviously is a function of the funds considered (i.e., total expenditures are from more funds than select state funding).

Chart 9. Total Expenditures per Student by % Non-White Deciles

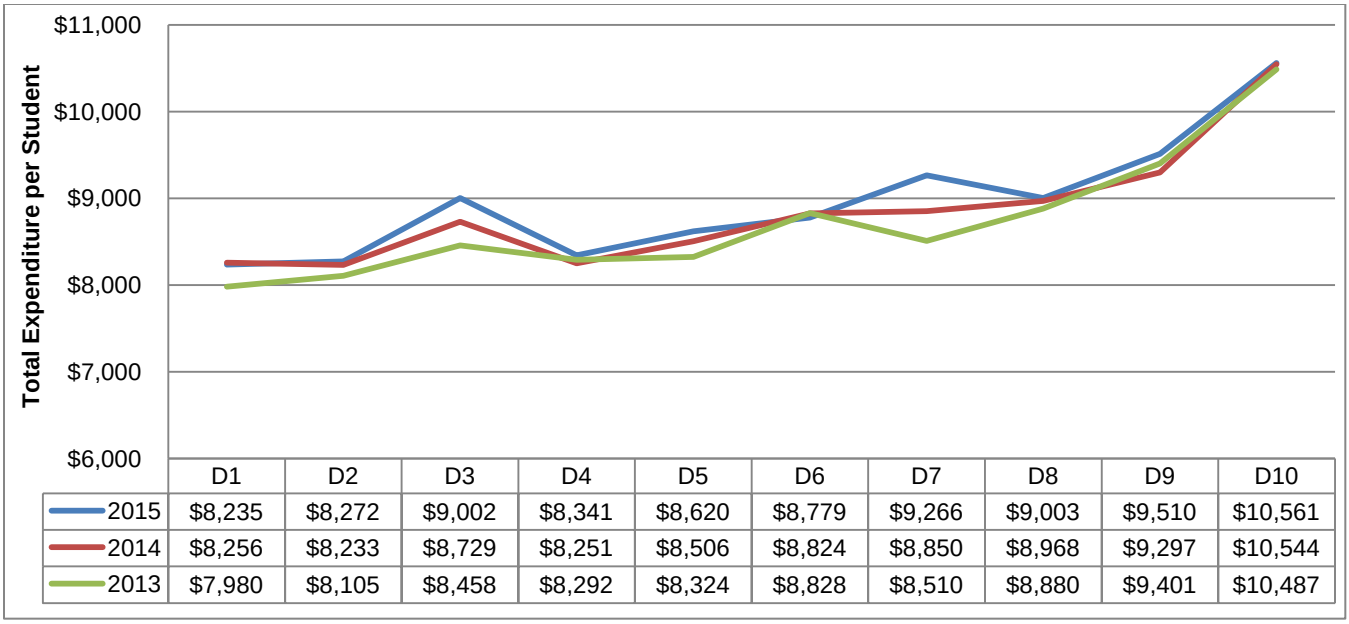


	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
2015	$8,922	$8,929	$8,820	$8,271	$8,776	$8,727	$8,770	$8,787	$9,261	$10,387
2014	$8,825	$8,819	$8,426	$8,372	$8,505	$8,663	$8,583	$8,855	$9,058	$10,381
2013	$8,668	$8,641	$8,443	$8,099	$8,439	$8,776	$8,363	$8,498	$9,084	$10,286

Note: % Non-white deciles shown from Lowest (D1) to Highest (D10).

Likewise, Charts 10 and 6, representing total expenditures and spending from select state funds respectively, have very similar patterns of results for free and reduced-price deciles across the three years examined. It is reasonable to infer that school districts, which receive more National School Lunch (NSL) funding because of higher concentrations of poverty, would spend more money for supplemental programs.

Chart 10. Total Expenditures per Student by % Free & Reduced-Priced Lunch Deciles

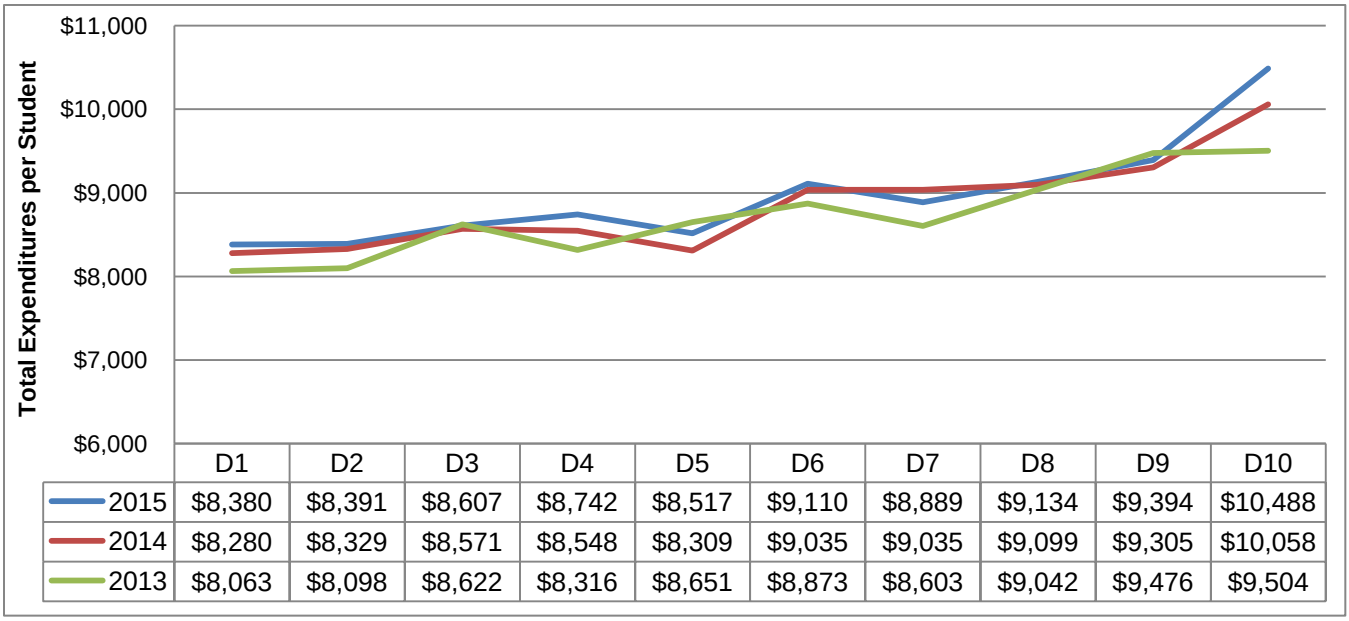


	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
2015	$8,235	$8,272	$9,002	$8,341	$8,620	$8,779	$9,266	$9,003	$9,510	$10,561
2014	$8,256	$8,233	$8,729	$8,251	$8,506	$8,824	$8,850	$8,968	$9,297	$10,544
2013	$7,980	$8,105	$8,458	$8,292	$8,324	$8,828	$8,510	$8,880	$9,401	$10,487

Note: % Free & reduced-priced lunch deciles shown from Lowest (D1) to Highest (D10).

Finally, Charts 11 and 7, dealing with total expenditures and expenditures from select state funds respectively, show similar patterns of findings, with a noticeable increase in spending in the highest decile of per-student property wealth. The same statements made about Chart 7 apply to the findings shown in Chart 11.

Chart 11. Total Expenditures per Student by per-Student Property Wealth Deciles



	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
2015	$8,380	$8,391	$8,607	$8,742	$8,517	$9,110	$8,889	$9,134	$9,394	$10,488
2014	$8,280	$8,329	$8,571	$8,548	$8,309	$9,035	$9,035	$9,099	$9,305	$10,058
2013	$8,063	$8,098	$8,622	$8,316	$8,651	$8,873	$8,603	$9,042	$9,476	$9,504

Note: Per-student property wealth deciles shown from Lowest (D1) to Highest (D10).

CONCLUSIONS

Taken together, the horizontal equity analyses offer convincing evidence that Arkansas has maintained an equitable distribution of funding over the past three years. The same conclusion was noted in 2014 after examining horizontal equity for the years 2011 through 2013 (Bureau of Legislative Research, 2014). The measures that are not influenced by the economy and state characteristics provide findings within the commonly accepted standards of equity. The coefficients of variance are marginally acceptable, whereas the McLoone Indexes and the Gini Coefficients are clearly within the acceptable range. The McLoone Index, for example, shows that districts in the bottom half of the funding distribution (on both variables) are funded at 95% of the funding that they would receive if they were funded the amount at the median (or 50% percentile). The Gini coefficient indicates that the funding distribution in Arkansas is just 6% off from perfect equity.

An examination of wealth elasticity clearly shows that each dollar increase in per-student property wealth has a small effect on either funding variable studied. The effect is 11 cents for each dollar increase in property wealth.

Finally, when district characteristics, commonly associated with school expenditures, were divided (or parsed) into deciles, the vertical equity analyses revealed limited and relatively insignificant differences, with the exception of more spending in districts with higher concentrations of poverty and lower ADM. These latter findings are well-established in the school finance literature (Ladd & Goertz, 2015; Odden & Picus, 2013).

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