Gains in Education Spending Equity Continue 20 Years After Fully Funding the Basic Education Program

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Gains in Education Spending Equity Continue 20 Years After Fully Funding the Basic Education Program

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**Staff Report to Members of the
Tennessee Advisory Commission on Intergovernmental Relations**

February 2021

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Gains in Education Spending Equity Continue 20 Years After Fully Funding the BEP Formula

The Basic Education Program (BEP) funding formula was adopted by the Tennessee General Assembly as a key part of the Education Improvement Act of 1992 (EIA). The primary purpose of the new funding formula, which was phased in between 1992-93 and 1997-98, was to improve equity in education spending. Spending equity correlates with better student performance, which is linked to increased high school and college graduation rates, greater employment opportunities, and improved quality of life, and ideally leads to similar outcomes for students of disparate socioeconomic backgrounds.

To measure equity improvement, staff of the Tennessee Advisory Commission on Intergovernmental Relations (TACIR) has issued a series of reports on spending equity beginning in fiscal year 1994-95—the midpoint of the six-year phase-in of the formula. A second report described the effect of fully funding the formula in school year 1997-98. Since then, TACIR staff has produced reports on spending equity every five years. A third report looked at the 2001-02 school year when the class-size reduction mandate of the EIA went into effect, a fourth examined equity 10 years after fully funding the BEP formula, and a fifth looked at equity 15 years after. This updated analysis examines data since the implementation of the formula and uses various statistics to measure the effect of the fully funded formula on equity in education spending through school year 2017-18—20 years after full funding.

The intent of the General Assembly to provide fair and equitable funding by implementing a formula that compensates for differences in local ability to pay for education was largely met by fully funding the BEP formula. Overall, spending equity improved as the new formula was phased in (fiscal years 1992-93 to 1997-98), with the increase in state revenue making up for differences in local revenue, and continued to improve through full funding. But despite early gains in education equity, the equalizing effect of state revenue has been too small to offset differences at the local level for at least the last 15 years. See appendixes A and B for maps and tables comparing spending equity in 1991-92 and 2017-18.[1]

Figure 1, and table 1 on page 12, shows the trend for a variety of measures of disparity or equity since the phasing in of the BEP began. Some indicate more improvement than others. Most show large declines in spending disparity at least through fiscal year 2004-05. After fiscal year 2004-05, four indicate worsening disparity while three indicate slight improvement.

> Despite early gains in education equity, the equalizing effect of state revenue has been too small to offset differences at the local level for at least the last 15 years.

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[1] The Education Improvement Act, as amended by Public Chapter 481, Section 5, Acts of 1993, imposed a statutory deadline on the phase-in of the Basic Education Program funding formula of July 1, 1997. That deadline was met.

Only two—the coefficient of variation and the Gini coefficient—clearly suggest continued improvement. Both the McLoone and Green indexes emphasize state spending per pupil for school systems below the median state spending per pupil, the point that divides the data exactly in half.

Figure 1. Change in Spending Disparity Since Fiscal Year 1991-92
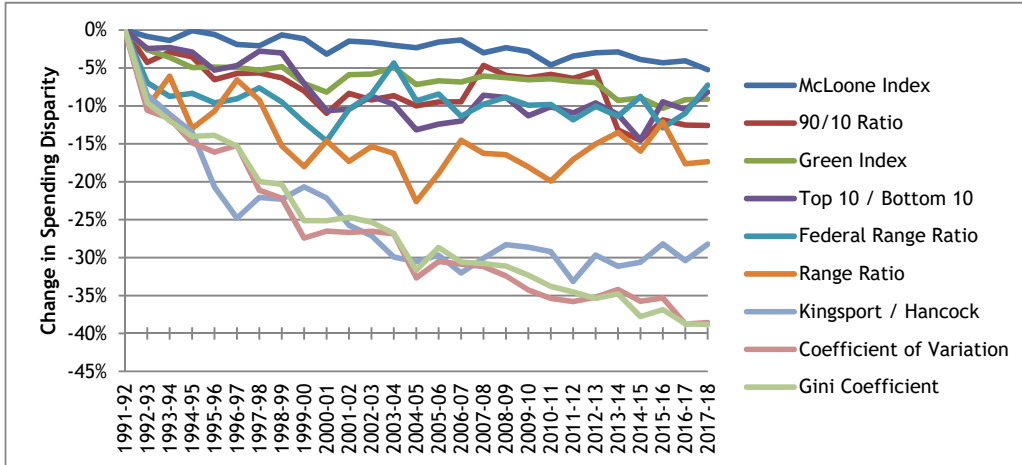
Note: Shelby County Schools absorbed the Memphis City School System in fiscal year 2013-14, and six new municipal school systems were formed in fiscal year 2014-15. This affected some of the equity measures.
Source: TACIR staff analysis of expenditures per pupil (average daily membership [ADM]) from the Tennessee Department of Education.

The same measures can be used to evaluate the extent to which the reduction in spending disparity resulted from changes in the distribution of state revenue. See table 2 on page 13. When applying these measures to state revenue, the bigger the number the better, whether positive or negative. Their trend since phase-in of the BEP began is shown in figure 2.

Figure 2. Change in State Revenue Differentiations Since Fiscal Year 1991-92
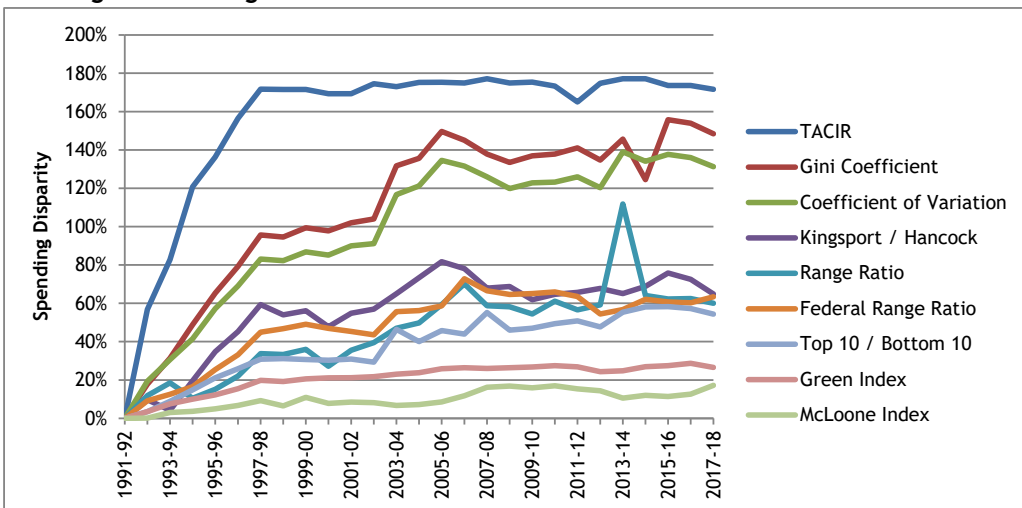

Note: Shelby County Schools absorbed the Memphis City School System in fiscal year 2013-14, and six new municipal school systems were formed in fiscal year 2014-15. This affected some of the equity measures.
Source: TACIR staff analysis of revenue per pupil (average daily membership [ADM]) from the Tennessee Department of Education.

State revenue equity improved as the BEP was phased in, but improvements halted in 2005-06 or shortly thereafter and most measures grew slowly until 2017-18. The McLoone and Green indexes grew the least, indicating less improvement in state revenue equity. It may be that some local governments have reduced their own effort to improve education spending, allowing state funds to gradually take their place, though maintenance of effort requirements would mitigate some of this effect. Over time, local governments may nonetheless cease increasing local spending as much as they had in the past, reducing the equalization effect of the formula. Another possible explanation is the concentration of wealth in certain systems. Moving forward, these are important areas to examine.

Given the differences in the needs of individual students—and the fact that they vary from system to system—measures of horizontal equity should not be expected to reach statistical perfection. Indeed, as the Tennessee Supreme Court has said in its rulings on education spending equity, the issue is neither perfect equality in funding nor sameness. The pursuit of equity in spending will always be an important issue in education finance. Statistical measures, including the ones discussed in this report, will allow Tennessee researchers and policymakers to recognize and follow emerging education finance trends.

Tennessee Supreme Court Decisions Shape the State's Education Funding Formula

The BEP formula became Tennessee's primary funding mechanism for education in fiscal year 1992-93 after the General Assembly adopted the new formula during the 1992 legislative session with the passage of the Education Improvement Act (EIA). The General Assembly also increased the state sales tax from 5.5% to 6.0% to support phasing in the formula over a six-year period. The revenue generated by the sales tax increase only partially funded the phase in and the rest of the funds came from growth in the existing sales tax base. Full funding was achieved in fiscal year 1997-98 with a cumulative total of $682 million in new funds distributed through the BEP formula. More than 90% of all state funding for education now flows through the BEP, and the state contribution to funding public schools has stayed around 45% to 48% of the total in recent years.

Legislative consideration of the BEP began in 1991, before the judicial decision in Tennessee Small School Systems v. McWherter (*Small Schools I*)[2] but after the initial filing of the lawsuit challenging the way the state funded education. A consortium of small, rural school systems filed suit in July 1988 asking the court to declare the old funding formula in violation of both the education and the equal protection clauses of the Tennessee

State revenue equity improved as the BEP was phased in, but improvements halted in 2005-06 or shortly thereafter and remained flat through 2017-18.

The General Assembly adopted the Basic Education Program funding formula during the 1992 legislative session as part of the Education Improvement Act.

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[2] Tennessee Small School Systems v. McWherter, 851 S.W.2d 139 (Tenn. 1993).

Constitution and to require the State to establish a new funding system that met constitutional standards. In March 1993—during the first year of the six-year phase-in period for the new funding formula—the Supreme Court of Tennessee ruled in favor of the plaintiffs on the equal protection clause, affirmed the trial court's holding allowing the General Assembly to devise a remedy, and remanded the case to the trial court for further proceedings.

The case returned to the Supreme Court in a second appeal after the trial court denied the plaintiffs' demand for immediate equalization, priority for capital improvements, and equity in teachers' salaries. The Supreme Court issued its second opinion in February 1995 (*Small Schools II*)[3] ruling against the plaintiffs on all issues except equalization of teachers' salaries. That issue was addressed by the General Assembly in 1995 with additional state funds external to the BEP formula. That funding scheme was challenged by the plaintiffs in 1998 and rejected by the Supreme Court in a decision issued in October 2002 (*Small Schools III*).[4]

After the *Small Schools III* case, the BEP formula was revised to address teacher pay equity issues by increasing the teachers' salary component in the BEP funding formula.[5] In 2005, the Voluntary Pre-K Act was introduced. Following that, a concerted effort between the governor's administration and the State Board of Education's BEP Review Committee (the entity responsible for evaluating the BEP) produced the shift to "BEP 2.0,"[6] which passed and became effective in 2007. Starting in school year 2007-08, a new tax capacity model produced by the Center for Business and Economic Research (CBER) at the University of Tennessee has been used in combination with the county-level fiscal capacity model produced by TACIR and used since the inception of the BEP funding formula in 1992.

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[3] Tennessee Small School Systems v. McWherter, 894 S.W.2d 734 (Tenn. 1995).
[4] Tennessee Small School Systems v. McWherter, 91 S.W.3d 232 (Tenn. 2002).
[5] Tennessee Code Annotated Title 49, Chapter 3, Part 3, (Public Chapter 670, Acts of 2004).
[6] Tennessee Code Annotated Title 49, Chapter 3, Part 3, (Public Chapter 369, Acts of 2007).

Improving Equity as Set Forth in the EIA and by the Court

Because the ability to generate local revenue to fund public schools varies so much across the state, the state contributes to local education agencies (LEAs) to level out their funding and spending. Local revenue per pupil (three-year average of 2016-17, 2017-18, and 2018-19) varies widely, ranging from $884 (Stewart) to $11,337 (Franklin Special School District). Each county's ability to pay determines the dollar amount that county has to contribute to the BEP, with the state making up the difference:

> . . . It is the intent of the general assembly to provide funding on a fair and equitable basis by recognizing the differences in the ability of local jurisdictions to raise local revenues.[7]

The General Assembly heard extensive testimony regarding the adoption of a methodology that would meet its intent to provide funding on a fair and equitable basis. TACIR's study of education fiscal capacity produced the methodology adopted to satisfy this requirement.

In *Small Schools II*, the Court acknowledged the new equalization method and further stated that

> [i]t appears that the BEP addresses both constitutional mandates imposed upon the State—the obligation to maintain and support a system of free public schools and the obligation that that system afford substantially equal educational opportunities.[8]

Fiscal capacity was not an issue in the Court's *Small Schools III* decision.

TACIR Fiscal Capacity and Equity

If counties were to levy the same taxes at the same tax rates, then the amounts collected would vary greatly across counties because their abilities to pay for education also vary greatly. Since fiscal year 1993, TACIR has determined the education fiscal capacity of each county by analyzing the

- tax base,
- ability to pay,
- tax burden, and
- education service burden variables.

TACIR determines counties' fiscal capacity by analyzing each county's tax base, ability to pay, tax burden, and education service burden.

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[7] Tennessee Code Annotated, Section 49-3-356, says "no LEA shall commence the fall term until its share of the BEP has been included in the budget approved by the local legislative body."
[8] Tennessee Small School Systems v. McWherter, 894 S.W.2d 738 (Tenn. 1995).

The result of the analysis is a dollar figure per pupil representing the fiscal capacity of each county-area. That figure is multiplied by the average daily student membership (ADM) of the public schools in each county-area to produce a figure for the county-area's fiscal capacity, and a percentage of the statewide total is computed for each county-area from those dollar figures.

Until fiscal year 2006-07, Tennessee calculated fiscal capacity this way, but beginning in 2007-08, the state began using a simpler, arithmetic estimate calculated by the University of Tennessee's Center for Business and Economic Research (CBER), which is averaged with TACIR's fiscal capacity estimate. When it was introduced, the intent was to phase it in and replace TACIR's estimate, but the 2007-09 recession caused a revenue shortfall and it has remained a hybrid of the two.[9]

The CBER model takes each county's sales and property tax bases and then multiplies them by their state average tax rates. Both the CBER and TACIR models produce indexes of each county's percent of the state's total fiscal capacity. To implement the equity provision adopted by the legislature, the Tennessee Department of Education applies the average of TACIR's and CBER's percentages to the aggregate local share of the BEP to determine each county's required local match. For multi-school-system counties, the Department computes an overall state and local percentage for each county-area and applies those ratios to determine the local match for each system within those counties (like Gibson County, which hosts five special school districts).

A Word on Sub-County Equity

Ideally, fiscal capacity would be measured at the system level rather than the county level. This is uniquely difficult in Tennessee because the three types of school systems here are funded differently at the local level. The uniqueness of this local governance and funding structure is described in a 2006 TACIR staff report, *Searching for a Fiscal Capacity Model: Why No Other State is Comparable to Tennessee*; past efforts to develop methods to measure fiscal capacity at the system level are described in a 2005 TACIR staff report, *A Prototype Model for School-System-Level Fiscal Capacity in Tennessee: Why & How*. See also TACIR's 2020 report, *Effects of Sharing of Revenue among School Systems in Counties with More than One School System*.

> "The fiscal capacity index estimates county-level fiscal capacity while the BEP allocates funds at the LEA level, resulting in funding inequities among LEAs within multi-LEA counties."
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> *Funding Public Schools: Is the BEP Adequate?* Tennessee Comptroller of the Treasury, July 2003.

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[9] During the transition from the TACIR to the CBER model, the results of both were to be used in calculating fiscal capacity. In the first year of transition, fiscal year 2007-08, each model was used to calculate 50% of each county's fiscal capacity. If the CBER calculation produced a percent of total fiscal capacity number that was more than a 30% change from the TACIR calculation, then the CBER percentage was adjusted such that the change was only 30%. The two indexes were then averaged to get the final fiscal capacity calculation. The intent was to shift the weight given the two measures toward the CBER model annually until it was the only one used, but they have remained evenly weighted.

A Framework for Measuring Equity

The BEP funding formula has been in place for 28 years and fully funded for 23. It has now been five years since its effect on fiscal equity was last measured. As noted in earlier reports, a set of questions that together comprise a framework for analyzing equity in school finance can be drawn from the education finance literature.

> **The questions are:**
>
> 1. For whom should school finance systems be equitable?
>
> 2. What resources or services should be distributed equitably?
>
> 3. How should equity be defined?
>
> 4. How should equity be measured?
>
> The fourth question is generally a two-part question, embodying both the measures and the results. It has been rephrased here, and the question of results is presented separately:
>
> 5. How equitable is the system?
>
> Questions one through four describe the framework for analyzing equity; question five involves the application of that framework to suggest conclusions.

How do questions 1 through 4 apply in Tennessee?

Who: Equity Groups

The two groups in which education equity researchers are generally interested are students and taxpayers. The concern for students was explicitly stated by the Tennessee Supreme Court in its unanimous opinion in *Small Schools I*:

> *. . . the disparities in educational opportunities available to public school students throughout the state . . . have been caused principally by the statutory funding scheme, which, therefore, violates the constitutional guarantee of equal protection.*[10]

This report presents eight measures of equity among students and one measure designed to evaluate both student and taxpayer equity.

"Equity should require that every student receives sufficient resources to have the same chance to succeed, rather than that every child gets the same level of funding."

Marin Gjaja, J. Puckett, and Matt Ryder, *Education Week*, "Equity is the Key to Better School Funding," February 19, 2014.

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[10] Tennessee Small School Systems v. McWherter, 851 S.W.2d 139 (Tenn. 1993).

What: Equity Objects

The education finance literature supports analyzing three general categories of things (or objects of interest) to be distributed equitably: inputs, outputs, and outcomes. To evaluate the extent to which the legislative intent of the BEP funding formula and the court's standard have been met, this report focuses on financial inputs. The traditional objects of interest in analyses of financial inputs are operating expenditures and various compositions of revenues. These data are easily obtainable and are collected uniformly across the United States, including in Tennessee. In addition, this type of analysis is generally accepted by the courts.

The literature also describes several levels at which these objects may be measured: the individual student, the school, the educational program within the school, and the school district as a whole. While the ideal level may be the individual student, such detailed data is rare. The most common level of analysis is the district. In Tennessee, the district, or system, is the only level at which financial data is available. It is also the level at which the BEP funding formula is calculated.

> Equity objects may be measured at different levels (e.g., student, school, or school district); however, the most common level of analysis is the school district.

Why: Defining Equity

Before equity can be measured, it must be defined. Education equity is generally described as having three dimensions:

1. Equal treatment of equals (horizontal equity): Students who are alike should receive equal shares. This principle requires equal expenditures or revenue per student. Disparities in spending or revenue among equals indicate less horizontal equity.

2. Unequal treatment of unequals (vertical equity): In some circumstances and for some reasons, it is not only acceptable but necessary to treat students differently. Examples include students with learning disabilities and students whose primary language is not English.

3. Equal opportunity: The amount of educational resources and services provided to students should not vary based on illegitimate characteristics such as race, gender, national origin, property wealth, or household income. In some cases, equal opportunity is treated as a condition of horizontal equity.

Vertical equity was not at issue in the lawsuit brought by the small systems in Tennessee. Both the funding formula replaced by the BEP and the BEP itself address issues of vertical equity by including adjustments for differing student needs based on grade level and program, including academic, career and technical, and special education.[11]

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[11] Tennessee Code Annotated, Section 49-3-354.

In *Small Schools I*, the court noted that neither equal funding nor sameness was the issue, but rather equal opportunity. The justices' rationale for finding Tennessee's education funding scheme unconstitutional centered on the relationship between dollars spent by a school system and the quality of education its students receive and the fact that the state's funding scheme produced great disparity in the revenues available to the school districts. Hence the focus of this report on measurements of horizontal equity.

How: Measuring Horizontal Equity

The education finance literature describes at least a dozen measures of horizontal equity. This report updates the fiscal equity measures presented in past spending equity briefs to analyze the change in the distribution of state revenue as a result of the BEP and to analyze the effect of the new formula on spending equity. Because there are no absolute standards for horizontal equity, multiple measures are used to ensure that too much emphasis is not placed on any one measure. The following is a brief general discussion of the statistics applied to Tennessee data. If all systems spent exactly the same amount per student, the four ratios and the McLoone and Green indexes would equal one; the coefficient of variation and the Gini coefficient would equal zero. The TACIR index is applied only to state revenue. If state revenue completely eliminated the disparity in local fiscal capacity, then the TACIR index would equal negative one.

Range Ratio. The range ratio is a traditional measure that compares the most extreme differences within a data set. Here it is calculated by dividing the highest value for expenditures per pupil by the lowest value. This is probably the weakest statistic of all those considered here because it includes only two school systems and gives no indication of equity among the school systems in between.

Federal Range Ratio. The federal range ratio is frequently used in school finance litigation arguments and in the distribution of some federal education funds. It avoids the extremes but, like the range ratio, includes only two school systems and gives no indication of equity among the others. It is calculated by dividing the value of the observation at the 95th percentile by the value at the 5th percentile with the values arranged in descending order.

Kingsport/Hancock County Ratio. This indicator is used here as in the past to illustrate the effect of the BEP on two systems made nationally famous by CNN. The CNN segment was shown at education conferences to illustrate a stark difference in equity. This index is computed by dividing Kingsport's expenditures per pupil by Hancock County's. It shares the same major weakness as the range ratios.

In *Small Schools I*, the court found Tennessee's method for funding education was unconstitutional. The rationale for the decision centered on the relationship between dollars spent by a school system, the quality of education students receive, and the fact that the state funding formula created disparity in the revenues available to school districts.

Top 10/Bottom 10 Ratio. This measure was used by the *Small Schools* plaintiffs to support their arguments that the previous funding formula and salary provisions violated the Tennessee Constitution. It is computed by dividing the average value of the top ten systems by the average value of the bottom ten systems. Because this measure includes more systems—and, therefore, more students—it is arguably more representative than the first three measures described; however, it still suffers from a focus on the extreme values and offers no indication of equity among the majority of school systems.

Coefficient of Variation. The coefficient of variation is a statistic that includes all values in a set of data. A commonly used statistic, it is based on the differences between each value in the data set and the mean or arithmetic average of all values. It is computed by dividing the standard deviation of the data set, which is derived from those differences, by its mean. One weakness of the coefficient of variation is that, because of its dependence on the mean, it is affected by extreme values. Although the standard deviation and coefficient of variation attempt to correct for extreme values, they do not always do so completely.[12]

> The Top 10/Bottom 10 Ratio was used by the *Small Schools* plaintiffs to support their arguments that Tennessee's school funding formula and salary provisions violated the Tennessee Constitution.

Gini Coefficient. The Gini coefficient is often used to measure the equality of wealth, income, and production. In our context, it is the average difference between every combination of two school systems divided by the average of all school systems.[13] Like the coefficient of variation, a strength of the Gini coefficient is that it takes all values into account. A weakness of the coefficient of variation and the Gini Coefficient is that each school system is given the same weight, meaning a school system with few students has just as much influence on the Gini coefficient as a school system with many students.

McLoone Index. The McLoone index uses the median rather than the mean in order to lessen the influence of extreme values. The median is the mid-point value that divides a set of data into two equal parts. The McLoone index is the ratio between the total expenditures of all systems at or below the median expenditure per student and what their total expenditures would be if all of them spent the median amount.[14]

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[12] Some of the money distributed by the federal government for Title 1 Every Student Succeeds Act to school systems across the country—$15.9 billion in school year 2020-21—is allocated according to states' coefficients of variation, measuring how much per pupil expenditures vary across systems within each state. Title 1 eligible students are given 40% more weight than other students, meaning systems with more Title 1 eligible students affect their states' coefficient of variation more. States with more equitable (smaller) coefficients of variation receive more federal money through the formula. The intent is to encourage states to make education spending more equitable across systems. Tennessee's equity factor for the 2020-21 school year is 10.6%, seventeenth best out of the 50 states, the District of Columbia, and Puerto Rico.

[13] Divided by two to adjust for double counting.

[14] The ratio is inverted as presented here to make it easier to compare with the other measures. Computed in the usual manner, the ratio will be less than one and the higher the ratio, the greater the equity. When inverted, the ratio will be more than one and the lower the ratio, the greater the equity, which is how the other measures presented are interpreted.

Green Index. Developed by TACIR's former executive director, the Green index is the ratio between spending for the top 50% of students and spending for the bottom 50%. The theory of this statistic is that expenditures per pupil for the top half of students should not greatly exceed the expenditures for the bottom half.

TACIR Equity Index. This statistic differs from the other statistics in that it measures equity among the counties both in funding for students and in taxpayer burden by comparing state funding to local fiscal capacity. It is designed to measure both the extent to which the education of the students in each county in Tennessee is equitably funded and the extent to which comparable effort by taxpayers produces reasonably equal funding for education in each county.

Similar or equal taxpayer effort will produce greatly unequal amounts of local revenue from county to county because of variations in the size of local tax bases; therefore, state funds should be distributed in inverse proportion to ensure reasonably equal funding overall.

This measure involves correlation analysis, which produces values between +1 and –1. In this case, as noted earlier, if state revenue distribution compensated perfectly for differences in local fiscal capacity, then the TACIR index would equal negative one.

Education Equity in Tennessee: What has the BEP Achieved?

The application of these nine measures to the first year of full BEP funding indicates education finance equity improved substantially as the funding formula was phased in and for a few years thereafter but has since leveled out. The years chosen for the analysis represent the last year of the previous funding formula—the Tennessee Foundation Program—as a base year (fiscal year 1991-92), the first year of full funding (fiscal year 1997-98), and every five years since. All trends presented are based on comparisons to fiscal year 1997-98. No definitive standard that would indicate a minimum acceptable degree of equity has been set for any of the measures described. Given that not all systems have exactly the same complement of students in terms of their needs, it is inappropriate to expect that any of the measures would equal exactly zero or one. Nevertheless, the measures are valuable as trend indicators.

All eight of the equity indicators presented in table 1 improved between the base year and full funding (fiscal year 1997-98), and a few improved further in 2002-03 and in 2007-08, but some stalled after that point. Decreases in spending equity measures represent greater equity. If all systems spent exactly the same amount per student, the four ratios and the McLoone and

Education finance equity improved substantially as the funding formula was phased in and for a few years thereafter but has since leveled out.

Decreases in spending equity measures represent greater equity.

Green indexes would each equal one; the coefficient of variation and the Gini coefficient would equal zero.

Table 1. Spending Equity Measurements for Tennessee
Select Fiscal Years 1991-92 to 2017-18

Equity Measure	Base Year 1991-92	Full Funding 1997-98	Change Base Year to Full Funding	After Full Funding				Change Since Full Funding
				5 Years 2002-03	10 Years 2007-08	15 Years 2012-13	20 Years 2017-18	
Range Ratio	2.23	2.02	-0.21	1.89	1.87	1.89	1.84	-0.18
Federal Range Ratio	1.60	1.48	-0.12	1.47	1.44	1.44	1.48	0.01
Kingsport/Hancock Ratio	1.54	1.20	-0.34	1.12	1.08	1.08	1.11	-0.09
Top 10/Bottom 10 Systems	1.65	1.61	-0.05	1.51	1.51	1.49	1.52	-0.09
Coefficient of Variation	0.16	0.13	-0.03	0.12	0.11	0.11	0.10	-0.03
Gini Coefficient	0.09	0.07	-0.02	0.06	0.06	0.05	0.05	-0.02
McLoone Index	1.10	1.07	-0.02	1.08	1.06	1.06	1.04	-0.03
Green Index	1.31	1.24	-0.07	1.23	1.23	1.22	1.19	-0.05

Source: TACIR staff analysis of expenditures per pupil (average daily membership [ADM]) from the Tennessee Department of Education.

The extent to which the improvement in spending equity resulted from changes in the distribution of state revenue may be judged in part by applying the same equity measures to revenues. Table 2 shows the result. In this case, the bigger the number the better, whether positive or negative. The farther the coefficient of variation and Gini coefficient are from zero and the farther the McLoone index, the Green index, and the four ratios are from one, the greater the differentiation among school systems in the distribution of state revenue. The closer the TACIR index is to negative one (-1), the more effective the state funding formula is in compensating for differences in local fiscal capacity.

Increases in revenue equity measures represent greater equity.

As table 2 illustrates, the degree of differentiation among school systems in the distribution of state funding increased substantially at full funding and continued to improve through fiscal year 2007-08. The coefficient of variation, the Gini coefficient, and the McLoone, Green, and TACIR indexes show most clearly how little differentiation among school systems in the distribution of state revenue existed before the BEP funding formula was implemented. The TACIR index, which is the one measure that directly incorporates local fiscal capacity, illustrates most clearly the improvement in the degree to which the new funding formula compensated for local variations. Since 2007-08, no measures have improved much, and the Federal Range Ratio and Top 10/Bottom 10 have declined somewhat.

All of the measures used in table 1 for spending equity and applied to state revenue in table 2 compare school systems to each other to evaluate equity in the state overall, not in individual systems. A simple way to evaluate

equity in a single system is to compare its expenditures per pupil as a percentage of the statewide amount for two separate years. Maps 1 and 2 in appendix A show the improvement in spending equity from 1991-92 to 2017-18 by school system, with more school systems moving closer to statewide expenditures per pupil (108) than moving away (27). The data for the maps are shown in appendix B for each school system.

Table 2. Equity Measurements Applied to State Revenue in Tennessee
Select Fiscal Years 1991-92 to 2017-18

Equity Measure	Base Year 1991-92	Full Funding 1997-98	Change Base Year to Full Funding	After Full Funding				Change Since Full Funding
				5 Years 2002-03	10 Years 2007-08	15 Years 2012-13	20 Years 2017-18	
Range Ratio	1.58	2.12	0.53	2.21	2.52	2.52	2.54	0.42
Federal Range Ratio	1.17	1.69	0.53	1.68	1.95	1.80	1.91	0.21
Kingsport/Hancock Ratio*	1.14	1.82	0.68	1.79	1.92	1.92	1.88	0.06
Top 10/Bottom 10 Systems	1.32	1.73	0.41	1.71	2.05	1.95	2.04	0.31
Coefficient of Variation	0.07	0.14	0.06	0.14	0.17	0.16	0.17	0.04
McLoone Index	1.03	1.12	0.09	1.11	1.20	1.18	1.21	0.08
Green Index	1.08	1.29	0.21	1.31	1.36	1.34	1.37	0.07
Gini Coefficient	0.04	0.08	0.04	0.08	0.09	0.09	0.10	0.02
TACIR Index	-0.32	-0.88	-0.55	-0.89	-0.89	-0.89	-0.88	-0.01

Source: TACIR staff analysis of revenue per pupil (average daily membership [ADM]) from the Tennessee Department of Education.

*Kingsport/Hancock is inverted so that increases in the ratio mean more differentiation, which is the intent of the state funding formula.

Progress but Room for Improvement

The intent of the General Assembly to provide fair and equitable funding by implementing a formula that compensates for differences in local fiscal capacity was largely met by fully funding the Basic Education Program, the formula adopted in 1992 in answer to a lawsuit brought by Tennessee's more rural school systems. Spending equity improved as the new formula was phased in, through full funding, but despite early gains in education equity the equalizing effect of state revenue has been too small to offset differences at the local level for at least the last 15 years. It may be that some local governments have reduced their own education spending efforts and replaced some of their local spending with state funds, though maintenance of effort requirements would minimize this effect. Over time, local governments may nonetheless cease increasing local spending as much as they had in the past, reducing the equalization effect of the BEP funding formula. Another possible explanation is the concentration of wealth in certain systems. Moving forward, these are important areas to examine.

Given the differences in the needs of individual students—and the fact that they vary from system to system—equity measures should not be expected to reach statistical perfection. Indeed, as the Tennessee Supreme Court has said in its rulings on education spending equity, the issue is neither perfect equality in funding nor sameness. The pursuit of equity in spending will always be an important issue in education finance. Statistical measures, including the ones discussed in this report, will allow researchers and policymakers to recognize and follow emerging education finance trends in Tennessee.

Why is spending equity important? The literature and data illustrate higher spending correlates with better student performance. Better student performance is linked to increased high school and college graduation rates, greater employment opportunities, and improved quality of life. Increased spending equity ideally leads to similar outcomes for students of disparate socioeconomic backgrounds, which was the primary intent of the General Assembly in passing the EIA. In light of Tennessee ranking 39th overall in the 2020 Annie E. Casey Foundation's Kids Count Data Book (which annually ranks states on ten indicators of child well-being), education spending equity is clearly an area to pursue for the welfare of Tennessee's future. This was a decline from 36th overall in the 2014 report.

Increased spending equity ideally leads to similar outcomes for students of disparate socioeconomic backgrounds, which was the primary intent of the General Assembly in passing the EIA.

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Appendix A

Map 1. School System Expenditures per Pupil as a Percentage of Statewide Expenditures per Pupil Fiscal Year 1991-92

67.0% - 75.0% 75.1% - 85.0% 85.1% - 95.0% 95.1% - 105.0% 105.1% - 115.0% 115.1% - 125.0% 125.1% - 135.0% 135.1% - 150.0%
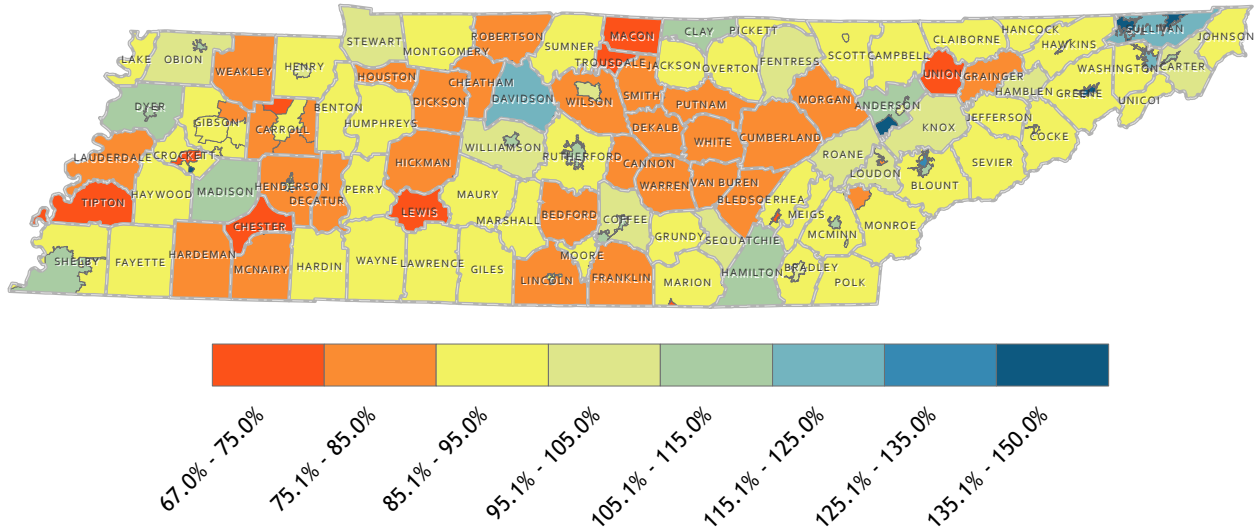
Map 2. School System Expenditures per Pupil as a Percentage of Statewide Expenditures per Pupil Fiscal Year 2017-18

67.0% - 75.0% 75.1% - 85.0% 85.1% - 95.0% 95.1% - 105.0% 105.1% - 115.0% 115.1% - 125.0% 125.1% - 135.0% 135.1% - 150.0%
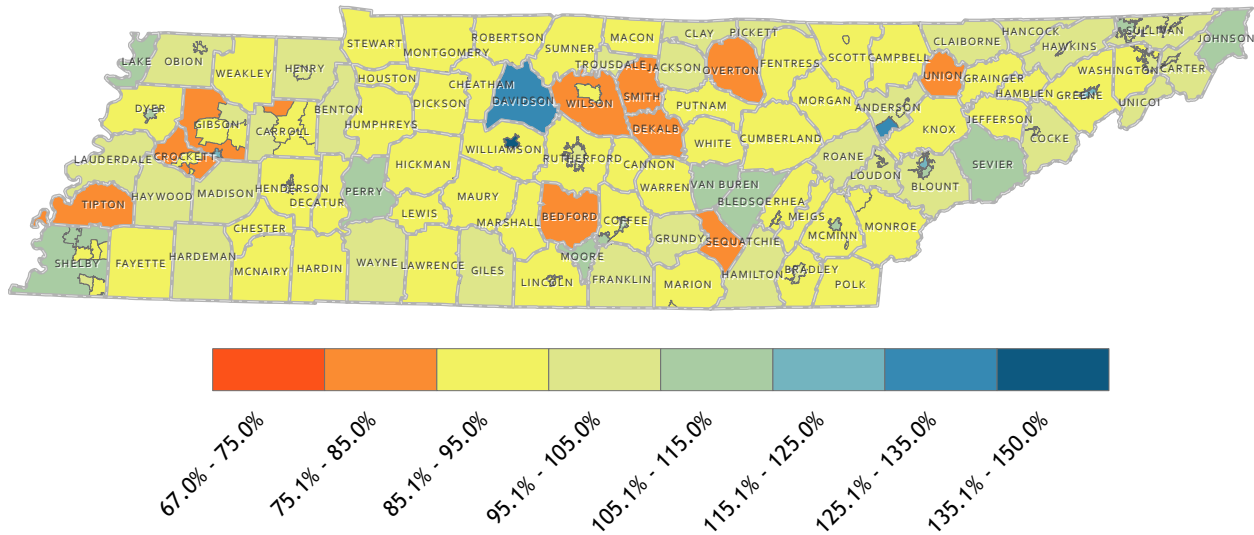
Appendix B

**Tennessee School System Expenditures per Pupil as a Percentage
of Statewide Expenditures per Pupil**

Fiscal Years 1991-92 and 2017-18

School System	Expenditures Per Pupil		School System	Expenditures Per Pupil	
	1991-92	2017-18		1991-92	2017-18
Anderson County	110%	103%	Dyer County	106%	93%
Clinton City	102%	101%	Dyersburg City	108%	109%
Oak Ridge City	150%	127%	Fayette County	93%	92%
Bedford County	84%	79%	Fentress County	103%	94%
Benton County	92%	104%	Franklin County	83%	100%
Bledsoe County	82%	107%	Humboldt City	89%	118%
Blount County	95%	98%	Milan SSD	92%	95%
Alcoa City	134%	119%	Trenton SSD	95%	94%
Maryville City	114%	107%	Bradford SSD	81%	102%
Bradley County	87%	86%	Gibson County SSD	89%	80%
Cleveland City	103%	99%	Giles County	92%	97%
Campbell County	92%	88%	Grainger County	79%	91%
Cannon County	80%	93%	Greene County	86%	90%
Hollow Rock-Bruceton SSD	80%	89%	Greeneville City	141%	116%
Huntingdon SSD	87%	87%	Grundy County	92%	98%
McKenzie SSD	75%	84%	Hamblen County	105%	90%
South Carroll Co SSD	78%	89%	Hamilton County	108%	100%
West Carroll Co SSD	85%	97%	Hancock County	95%	98%
Carter County	96%	98%	Hardeman County	82%	103%
Elizabethton City	114%	101%	Hardin County	87%	93%
Cheatham County	76%	93%	Hawkins County	91%	99%
Chester County	74%	88%	Rogersville City	91%	104%
Claiborne County	91%	97%	Haywood County	91%	105%
Clay County	107%	97%	Henderson County	78%	89%
Cocke County	89%	96%	Lexington City	88%	104%
Newport City	93%	98%	Henry County	89%	98%
Coffee County	98%	95%	Paris SSD	103%	98%
Manchester City	114%	115%	Hickman County	83%	95%
Tullahoma City	112%	111%	Houston County	79%	92%
Crockett County	88%	85%	Humphreys County	89%	91%
Alamo City	67%	95%	Jackson County	91%	104%
Bells City	71%	92%	Jefferson County	87%	91%
Cumberland County	85%	89%	Johnson County	92%	110%
Davidson County	123%	126%	Knox County	104%	92%
Decatur County	85%	92%	Lake County	93%	111%
DeKalb County	76%	83%	Lauderdale County	76%	97%
Dickson County	84%	91%	Lawrence County	86%	88%

Appendix B (continued)

**Tennessee School System Expenditures per Pupil as a Percentage
of Statewide Expenditures per Pupil**
Fiscal Years 1991-92 and 2017-18

School System	Expenditures Per Pupil		School System	Expenditures Per Pupil	
	1991-92	2017-18		1991-92	2017-18
Lewis County	71%	94%	Scott County	86%	89%
Lincoln County	83%	93%	Oneida SSD	94%	91%
Fayetteville City	91%	91%	Sequatchie County	103%	84%
Loudon County	100%	97%	Sevier County	94%	106%
Lenoir City	85%	104%	Shelby County	89%	107%
McMinn County	90%	90%	Memphis	115%	NA
Athens City	108%	107%	Arlington	NA	90%
Etowah City	96%	92%	Barlett	NA	92%
McNairy County	83%	88%	Collierville	NA	94%
Macon County	72%	87%	Germantown	NA	98%
Madison County	113%	99%	Lakeland	NA	89%
Marion County	86%	90%	Millington	NA	107%
Richard City SSD	68%	93%	Smith County	80%	85%
Marshall County	91%	90%	Stewart County	96%	92%
Maury County	88%	93%	Sullivan County	122%	96%
Meigs County	90%	94%	Bristol City	141%	103%
Monroe County	89%	95%	Kingsport City	147%	108%
Sweetwater City	83%	90%	Sumner County	90%	89%
Montgomery County	89%	93%	Tipton County	75%	85%
Moore County	95%	114%	Trousdale County	75%	96%
Morgan County	83%	95%	Unicoi County	89%	96%
Obion County	100%	96%	Union County	75%	83%
Union City	113%	98%	Van Buren County	83%	115%
Overton County	88%	85%	Warren County	84%	91%
Perry County	86%	112%	Washington County	90%	87%
Pickett County	92%	98%	Johnson City	120%	101%
Polk County	95%	95%	Wayne County	88%	100%
Putnam County	80%	93%	Weakley County	84%	88%
Rhea County	87%	95%	White County	83%	90%
Dayton City	73%	87%	Williamson County	103%	94%
Roane County	102%	99%	Franklin SSD	108%	146%
Robertson County	83%	93%	Wilson County	77%	84%
Rutherford County	95%	90%	Lebanon SSD	97%	94%
Murfreesboro City	106%	103%			

Source: Tennessee Department of Education.