

Fiscal Capacity and Equalization of Education Funding in Tennessee

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Overview of Fiscal Capacity and Rationale for Equalization

*If a county has a relatively low total assessed value of property and very little business activity, that county has, in effect, a stone wall beyond which it cannot go in attempting to fund its educational system regardless of its needs. In those cases, local control is **truly a "cruel illusion"** for those officials and citizens who are concerned about the education of the county's school children.*

...

*The constitutional mandate that the General Assembly shall provide for a system of free public schools guarantees to all children of school age in the state the opportunity to obtain an education. The provisions of the constitution guaranteeing equal protection of the law to all citizens, require that the educational opportunities provided by the system of free public schools be substantially equal. The constitution, therefore, imposes upon the General Assembly the obligation to maintain and support a system of free public schools that affords **substantially equal educational opportunities to all students.***

Tennessee Supreme Court
1993

Why Equalize Education Funding?

- ◆ *Tennessee's Constitution requires substantially equal educational opportunity for all students, according to the state's Supreme Court.*
- ◆ *Local governments cannot all raise the same amount of revenue per student with the same tax rates.*
- ◆ *The state created the local tax structure and must make up the difference.*

Major Fiscal Capacity Principles

- I. Fiscal capacity should be estimated from a comprehensive, balanced tax base.*
- II. Fiscal capacity should focus on economic bases rather than policy determined revenue bases.*
- III. Tax base estimates should be as current and accurate as possible.*
- IV. Similarly situated taxpayers should be treated similarly in terms of taxes paid and the services received.*
- V. Tax exportability should be measured—resident taxpayers in different jurisdictions should have similar fiscal burdens.*
- VI. Fiscal capacity measures should reflect service responsibilities that vary across jurisdictions.*
- VII. Estimates should be based on multi-year averages to mitigate data errors and control volatility.*
- VIII. Fiscal capacity should reflect adjustments for factors that cause differential costs—to the extent that costs are not accounted for otherwise.*

Source: U.S. Department of the Treasury, Office of State and Local Finances. Federal-State-Local Fiscal Relations, Vol. I-III. Report to the President and Congress (September 1985).

Local Fiscal Effort

Represents what school systems *are doing* to fund education.



Local Fiscal Capacity

Represents what school systems *can do* based on relevant community characteristics:

- ♦ *Tax base*
- ♦ *Income*
- ♦ *Tax burden*
- ♦ *School Population*

**Average Local Fiscal Effort =
Average Local Fiscal Capacity**

TACIR Fiscal Capacity Model

What is it?

- **A Modified Representative Tax System Approach**
(Regression Weighted)
- **A Pupil Equity Model**—measured by the tax base per student
- **A Taxpayer Equity Model**—measured by
 - *Ability to pay*
 - *Resident tax burden*
 - *Tax exportability*
- **A Fiscal “Behavioral” Model**
 - *Does not set normative standards for local revenue.*
 - *Accepts actual levels of local revenue as basis for measuring fiscal capacity—average fiscal capacity per pupil equals average actual revenue per pupil.*
- **Three-year Moving Average**—mitigates both errors and volatility in the data

Components and Limitations of the County-level Model
Basic Education Program Formula Equalization
County-level Fiscal Capacity Model

<u>Components</u>		<u>Factors</u>
Local Revenue	☞	<i>Own-source Revenue per Pupil</i>
Tax Base <i>(Pupil Equity)</i>	☞	▪ <i>Taxable Sales per Pupil</i>
	☞	▪ <i>Property per Pupil</i>
Ability to Pay <i>(Taxpayer Equity)</i>	☞	<i>Per Capita Income</i>
Resident Tax Burden <i>(Taxpayer Equity)</i>	☞	<i>Ratio of Residential & Farm Assessment to Total Assessment</i>
Service Responsibility <i>(Pupil Equity)</i>	☞	<i>Ratio of Average Daily Membership to Population</i>
<hr/>		
Methodology	☞	<i>Ordinary Least Squares Multiple Linear Regression</i>
<hr/>		
Output	☞	<i>Fiscal Capacity per Pupil</i>

Components and Limitations of the County-level Model

County Model Concerns and Limitations

- #1.** *It is a county model used in a funding formula for school systems—twenty-eight Tennessee counties have more than one school system.*
- #2.** *The most current data for the tax equivalent payments included in the property tax base factor are for 1995 and clearly out of date.*
- #3.** *Revenue from state-shared taxes is used to fund some cities' general fund transfers and, therefore, is included for them, but the same source of revenue is not included for other school systems.*
- #4.** *The income data used to measure taxpayer equity—per capita personal income—includes residents in group quarters, such as college dormitories and prisons, and 'outliers', residents with unusually high, atypical incomes.*
- #5.** *The service burden factor should be reconsidered in light of changes that have made the BEP formula itself a better measure of the public schools' service burden.*

A User's Guide to Fiscal Capacity in the Basic Education Program Formula (TACIR 2004)

System-level Model—Why and How

Tennessee’s Unique Challenge

How to Handle Disparate Fiscal Entities

in a Single Model

- ◆ **Measuring fiscal capacity for Tennessee’s 136 school systems presents**

Two Significant Challenges

- *different authority to tax and raise revenue*
- *different fiscal relationships among systems*
- ◆ **County governments***
 - *Must levy county-wide tax for schools*
 - *May tax property*
 - *May tax sales*
 - *May tax other activities (e.g., wheel tax)*
 - *Must share school taxes with other systems in county*
 - *May use revenue from state-shared taxes for schools without sharing*
- ◆ **City governments**
 - *Receive share of county governments’ school revenue*
 - *May make general fund transfers for schools (some do; some don’t)*
 - *May tax property*
 - *May tax sales*
 - *May tax other activities*
 - *Need not share school funds with any other system*
 - *May use revenue from state-shared taxes for schools without sharing*
- ◆ **Special School Districts**
 - *Receive share of county governments’ school revenue*
 - *May only tax property*
 - *Need not share school funds with any other system*

* County governments are not required to operate schools (if all students in the county can attend a city system or special school district), but if they do so, must establish education taxes for them.

System-level Model—Why and How

Tennessee’s Unique Challenge

Disparate Fiscal Entities—

Different Revenues, Different Sharing Requirements

- Different kinds of school systems have access to different revenue sources
- Different kinds of school systems have different sharing obligations when accessing their revenue sources for schools

Revenue Source	County School Systems	City School Systems	Special School Districts
Property			
▪ Shared	Yes—retain portion of county taxes based on share of WFTEADA	Yes—receive from county based on share of WFTEADA	Yes—receive from county based on share of WFTEADA
▪ Unshared	No—county revenue for education must be shared*	Yes—at individual city’s discretion or through general fund transfer	Yes—based on rate established by legislature
Taxable Sales			
▪ Shared	Yes—retain portion of county taxes based on share of WFTEADA	Yes—receive from county based on share of WFTEADA	Yes—receive from county based on share of WFTEADA
▪ Unshared	No—county revenue for education must be shared*	Yes—at individual city’s discretion or through general fund transfer	No—not authorized by legislature
State-shared Tax Revenue			
	Yes—no sharing requirement	Yes—no sharing requirement	No—not eligible to receive

A note about values included in the fiscal capacity model: All systems have values greater than zero for tax base variables that generate county education revenue that must be shared, including the resident tax burden variable that is based on the county-area property tax base. If the table above indicates that a particular revenue source is not available, then the fiscal capacity model will include zeros for those kinds of systems. For example, special school districts receive zeros unshared taxable sales and zero state-shared taxes. Similarly, county school systems receive zero unshared property and sales tax revenues and have a zero for the resident tax burden associated with unshared property tax revenues.

* Except in very limited circumstances (i.e., to support countywide transportation fund or to repay rural education debt).

System-level Model—Why and How

No Other State is as Complex

Other States Have Multiple Types of School Systems, but All Have the Same Fiscal Authority

State	Types Of School Systems	Different Fiscal Authority	Fiscal Capacity Measure Used	Major Own-Source Revenues Considered	Other Minor Revenue Available
Alabama	C,M	no	Yes	P	S
Arizona	I,C	no	yes	P	none
California	I,C,M	no	no	na	na
Connecticut	I,C,M	no	yes	P	none
Maine	I,M,T	no	yes	P	V
Massachusetts	I,C,M,T	no	yes	P	V,H
Michigan	I,M,S	no	yes	P	none
New Hampshire	I, C,M	no	yes	P	none
New Jersey	I,C,M,T	no	yes	P	NT
New York	I,C,M	no	yes	P	S
Rhode Island	I,M,T	no	no	na	na
Tennessee	I,C,M	yes	yes	P,S	State-shared Tax Revenue
Virginia	I, C, M	no	yes	P,S	Other

Source: “2002 Census of Governments” and individual state data.

Notes

Types of School Systems: I = independent school district, C = county system, M = municipal system, T = town or township system.

Major own-source revenues: P = property taxes, S = sales taxes, I = income tax, V = annual vehicle excise tax, H = hotel motel taxes, NT = non-tax revenue, Other = state reimbursement payments for phased-out local vehicle property taxes.

States not listed: School districts in all other states are fiscally identical. Only states with fiscally disparate systems, including special/independent school districts provide a useful comparison for Tennessee.

Virginia: Cities in Virginia are completely independent of counties.

System-level Model—Why and How

Early Efforts to Develop a System-level Model

1990 TACIR Staff Report described two fiscal capacity models for school systems—

Normative Representative Tax Model (developed by Don Thomas, consultant to Governor McWherter)

Assumed all local revenue for public schools came from property and sales taxes—59% from property and 41% from sales.

Estimated average tax rates for property and sales based on those proportions.

Applied average tax rates to property and sales tax bases for each county area.

Divided results within each county among school systems based on weighted full-time-equivalent average daily membership.

Problems—ignored other sources of revenue, ability to pay; different tax bases of counties, cities and special school districts.

Property Tax Base Approach—two variations

Both assumed all local revenue for public schools came from property.

Unique Property Tax Base—treated all school systems as if they were special school districts.

Overlapping Property Tax Base—treated county systems in multi-system counties as if they were not subject to sharing requirements.

Problems—ignored other sources of revenue, ability to pay; different fiscal structures of county and city school systems and special school districts.

System-level Model—Why and How

Efforts to Develop a System-level Model Resume After Full Funding of the BEP Formula

1998 TACIR staff refines conceptual framework:

- **considers one- and two-tier models**
- **develops two-tier model with**
 - *current county model as tier one*
 - *tier two splits tier one for multi-system counties based on property and sales*

2001 TACIR staff refines two-tier model:

- **current county model as tier one**
- **tier two splits tier one for multi-system counties based on property, sales and income**
(as proxy for other taxes)

2002 TACIR staff continues to evaluate two-tier model and, with Comptroller's staff, explores alternatives

- **income measures for school systems—**
 - *insufficient data at system level (only two years of data for school-aged child poverty)*
 - *technical and confidentiality problems using IRS data as substitute for traditional measures*
- **insufficient data for municipal overburden (non-education service burden)**

System-level Model—Why and How

Four Alternative Models Evaluated for Task Force

- **Two two-tier models, both w/regression-based county tier**
 - ♦ *both with modified county model as tier one*
 - *property and sales tax bases combined into a single variable*
 - *median household income as measure of taxpayer equity*
 - *school-age child poverty as measure of service burden*
 - ♦ *algebraic tier two based on property and sales tax bases plus revenue available from state-shared taxes*
 - ♦ *regression-based tier two*
 - *shared and unshared combined property and sales tax base variables*
 - *system-level tax exportability*
 - *system-level school-aged child poverty*

- **Two one-tier models**
 - ♦ *algebraic based on property and sales tax bases plus revenue available from state-shared taxes*
 - *average tax and usage^{*} rates calculated from actual revenue for schools divided by tax base or available state-shared tax revenue*
 - *separate calculations for shared and unshared tax bases*
 - ♦ *full regression based on same components as current county model*

* Usage rate applies to state-shared tax revenue.

System-level Model—Why and How





TACIR School System Fiscal Capacity Model

What is it?

- **A Modified Representative Tax System Approach**
(Regression Weighted)
- **A Pupil Equity Model**—measured by the tax base per student
- **A Taxpayer Equity Model**—measured by
 - ◆ Ability to pay
 - ◆ Resident tax burden
 - ◆ Tax exportability
- **A Fiscal “Behavioral” Model**
 - *Does not set normative standards for local revenue.*
 - *Accepts revenue levels actually allocated by local governments as basis for measuring fiscal capacity.*
- **Three-year Moving Average**
 - *Based on most current data available*
 - *Mitigates both errors and volatility in the data*
- **A 136-System Model**
 - *Based on same principles and components as 95-county model*
 - *Estimates fiscal capacity per pupil (dollar value)*
 - *Produces fiscal capacity index (percent of total dollars)*
 - ◆ *capacity per pupil times number of pupils = system capacity*
 - ◆ *sum of the products for the systems = total statewide capacity*
 - ◆ *each system’s total capacity divided by the statewide total capacity = percent of total fiscal capacity for each system*

System-level Model—Why and How

System-level Fiscal Capacity Model Components & Factors

<u>Components</u>		<u>Factors</u>	<u>County Area</u>	<u>School System</u>
Local Revenue	☞	Own-source Revenue per Pupil		☑
Tax Base (Pupil Equity)	☞	▪ Taxable Sales per Pupil	☑	☑
	☞	▪ Property per Pupil	☑	☑
	☞	▪ State-shared Taxes per Pupil 		☑
Ability to Pay (Taxpayer Equity)	☞	▪ Median Household Income 	☑	
	☞	▪ Child Poverty Rate 		☑
Tax Burden/Exportability (Taxpayer Equity)	☞	Ratio of Business-related* Assessment to Total Assessment 	☑	☑
Methodology	☞	Ordinary Least Squares Multiple Linear Regression		

A note about school system tax base and tax burden measurements: Every factor or variable in the fiscal capacity regression model must have a value for every school system. All systems have values for all *county-area* measurements.

- If the funding body for a school system cannot tax a particular base, then that system will have a value of zero for the *system-level* measurement (e.g., special school districts cannot tax sales and do not receive state-shared taxes).
- If the funding body cannot tax a particular base without having to share the revenue among other systems in the county, then that system will have a value of zero for the *system-level* measurement (e.g., counties cannot tax property or sales without sharing the revenues).

* Commercial, industrial, utility and personal property.

System-level Model—Why and How

Prototype System-level Fiscal Capacity Factors and Weights

Average Actual Revenue per Pupil: \$1,864			
<i>Factors used to estimate Revenue per Pupil</i>	Average System Value	Weights Produced by Model	Average Weighted Value
Constant Value to be Included in Each System's Estimate	n/a	-\$22	-\$ 22
Taxable Property per Pupil			
▪ Shared	\$86,017	+0.0047	404
▪ Unshared	\$34,926	+0.0048	168
Taxable Sales per Pupil			
▪ Shared	\$41,253	+0.0204	842
▪ Unshared	\$26,573	+0.0010	27
State-shared Tax Revenue per Pupil (Unshared)	\$234	+0.1714	40
Tax Exportability Ratios			
▪ Shared	35.21%	+\$570	201
▪ Unshared	16.68%	+\$152	25
County Median Household Income	\$33,508	+0.0130	436
System Child Poverty Rate	18.17%	-\$1,399	-254
Fiscal Capacity (Estimated Revenue) per Pupil:			\$ 1,864

System-level Model—Why and How

Volunteer County Example

Fiscal Capacity Measurement	School Systems in Volunteer County		
	Volunteer County	Polk City	Best SSD
<i>Revenue per Pupil</i>	\$1,617	\$2,669	\$1,919
<i>Shared Property per Pupil</i>	\$86,645	\$86,645	\$86,645
<i>Unshared Property per Pupil</i>	\$0	\$125,537	\$84,197
<i>Shared Taxable Sales per Pupil</i>	\$40,258	\$40,258	\$40,258
<i>Unshared Taxable Sales per Pupil</i>	\$0	\$129,067	\$0
<i>State-shared Tax Revenue per Pupil</i>	\$169	\$572	\$0
<i>Shared Tax Exportability Ratio</i>	34.08%	34.08%	34.08%
<i>Unshared Tax Exportability Ratio</i>	0.00%	60.91%	38.19%
<i>County Median Household Income</i>	\$33,066	\$33,066	\$33,066
<i>System Child Poverty Rate</i>	17.45%	21.06%	17.22%
<i>System-level Fiscal Capacity per Pupil</i>	\$1,614	\$2,458	\$2,048
<i>Old County-area Fiscal Capacity</i>	\$1,635	\$1,635	\$1,635

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I. Summary of How We Got Here

1979—State Equalization Plan for Financing the Public Schools in Tennessee, prepared by the Tennessee School Finance Equity Study: *the state should utilize an equitable measure of the relative taxing abilities of the local educational agencies.*

1990—First Performance Audit of Board and Department of Education: “Funds available for public education vary considerably from school district to school district in Tennessee.” Board and Department concur and note that system-level model is in development.

TACIR Staff Report: describes two system-level fiscal capacity models.

1992—County Model Adopted for Use in BEP Formula

1993—Tennessee Supreme Court establishes principle of “substantially equal educational opportunity for all students.”

1995—Tennessee Supreme Court finds new funding scheme unconstitutional:

(June) Commissioner of Education and Executive Director of State Board: request that TACIR develop a system-level model to assist with solution; Commission defers further discussion until BEP is fully funded.

1998—TACIR staff: refines conceptual framework; develops two-tier model.

2001—TACIR staff: refines two-tier model

2002—TACIR staff: continues to refine two-tier model; consults w/Comptroller staff.
(October) Tennessee Supreme Court again finds funding scheme unconstitutional.

2003—Governor Bredesen: appoints Teacher Salary Tax Force to recommend solution.
(July) Comptroller’s Office of Education Accountability: “The fiscal capacity index estimates county-level fiscal capacity while BEP allocates funds at the LEA level, resulting in funding inequities among LEAs within multi-system counties.

(November) Task Force issues recommendations: “Introduce a new district/system-level fiscal capacity model in order to provide a fairer method of determining local contribution.”

2004—General Assembly: asks BEP Review Committee to “give special consideration to . . . development and implementation of a system-level fiscal capacity model.”

BEP Review Committee: endorses concept of a 136 system-level prototype and voted to recommend in its November 2005 report that Tennessee convert to a system-level equalization model.

Appendices

II. Basis and Rationale for Equalization of Education Funding

When states accept responsibility for partially funding local programs, treating taxpayers of each jurisdiction fairly becomes important.

Because local governments cannot all raise the same revenue with the same tax rates, principles of fundamental fairness require that the state allocate its share of funding in a way that helps even things out so that residents in every part of the state are treated similarly with respect to their ability to pay taxes and the services provided there.

If the state

- requires local governments to do something,
- provides only part of the money it takes to do it **and**
- requires local governments to match the state funds, **but**
- makes them all put up the same share, say one-fourth of the amount the state provides,

then residents of some areas will have to pay higher tax rates than residents of other areas in order to get the state's money and do what is required. **That creates a taxpayer equity problem.**

Likewise, if the state requires each local government to impose the same tax rate, but gives each the same amount of funding per student, for example, that creates a pupil equity problem.

Appendices

Statutory Authority for Equalization

49-3-356. State and local contributions to basic education programs funds – Equalization. The state shall provide seventy-five percent (75%) of the funds generated by the Tennessee BEP formula in the classroom components, sixty-five percent (65%) in the instructional positions component and fifty percent (50%) in the nonclassroom components as defined by the state board. Every local government shall appropriate funds sufficient to fund the local share of the BEP. 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. From the local portion of such revenues, there shall be a distribution of funds for equalization purposes pursuant to a formula adopted by the state board, as approved by the commissioners of education and finance and administration. 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. [emphasis added]

HISTORY: Acts 1992, ch. 535, § 3; 2004, ch. 670, § 1.

Appendices

Early Calls for System-level Equalization

1979—State Equalization Plan for Financing the Public Schools in Tennessee, prepared by the Tennessee School Finance Equity Study

*“To determine the sharing of educational costs between the State and the local education agencies, **the state should utilize an equitable measure of the relative taxpaying abilities of the local educational agencies.**”*

1990—First Performance Audit of Board and Department of Education: “[f]unds available for public education vary considerably from school district to school district in Tennessee.” The Board and the Department concurred. The Board comments on the causes and notes that the proposed new funding formula would include a system-level gauge of ability to fund schools.

*“Independent taxing power of city and special school systems does contribute to the existing disparity in funding among the state’s systems. Citizens of city and special school systems have the ability and usually the will to tax themselves for the purpose of investing more in their schools. County residents may have the will but typically not the ability to do the same, given their limited tax base. **The Board’s Basic Education Program proposal would resolve much of this problem by gauging state appropriations for schools to each system—county, city, or special—according to each’s ability to raise local tax revenue for schools.** The result would both assure adequate resources in all systems and decrease the funding disparity among systems.”*

Appendices

Small Schools I

Tennessee’s Supreme Court initially found the state’s method of funding public schools unconstitutional in 1993:

*The constitutional mandate that the General Assembly shall provide for a system of free public schools guarantees to all children of school age in the state the opportunity to obtain an education. The provisions of the constitution guaranteeing equal protection of the law to all citizens, require that the educational opportunities provided by the system of free public schools be substantially equal. **The constitution, therefore, imposes upon the General Assembly the obligation to maintain and support a system of free public schools that affords substantially equal educational opportunities to all students.***

Emphasizing the responsibility of the legislature for the actions of the local governments it creates, the Court said,

the constitution does not permit the indifference or inability of [counties, municipalities, and school districts] to defeat the constitutional mandate of substantial equality of opportunity.

Tennessee Small School Systems et al. v. McWherter et al. (Small Schools I, 1993).

Appendices

Small Schools II Prompted Requests to Develop a System-level Model

In response to 1995 Tennessee Supreme Court decision (Small Schools II) finding the state’s method of funding education unconstitutional because of its failure to equalize teachers’ salaries, the Commissioner of Education and the Executive Director of State Board of Education request review by TACIR staff of fiscal capacity model and development of system-based model in June 1995.

“If the department could distribute BEP funds on a fiscal capacity index that more accurately reflected the situation in each district, it would aid in the quest for equalization, be as fair as possible, and help the department in its continual battle over salaries and other issues where there is such great disparity.”

Commissioner Jane Walters

“The original premise of the BEP was that the responsibility for funding schools was split between the state and local governments. Given that local governments had different abilities to pay, local responsibility would be divided according to ability to pay. Conceptually at least, the notion was that there were 139 school systems and there would be 139 splits of that local responsibility.”

Brent Poulton, Exec. Dir. State Board of Ed.

The Commission recommended postponing further work until the BEP was fully funded.

Appendices

Small Schools III Lead to Renewed Calls for a System-level Model

▪ Governor Bredesen's Task Force on Teacher Pay

- *Appointed by Executive Order No. 5, February 2003*
- *Final Report issued November 2003 with Ten Recommendations, including*

#4. Introduce a New District-Level Fiscal Capacity Model—*Introduce a new district/system-level fiscal capacity model in order to provide a fairer method of determining local contribution. Currently, the model measures the fiscal capacity of 95 counties. A new district/system level will measure the capacity of 136 systems.*

▪ Basic Education Program Review Committee

- *Appointed by the State Board of Education*
- *Asked by General Assembly to “give special consideration to . . . development and implementation of a system-level fiscal capacity model.”*
- *“Endorsed the concept of a 136 system-level prototype. The committee voted to recommend, in its November 1, 2005 report, that Tennessee convert from a 95 county to a 136 system-level equalization model.” (November 2005 Annual Report)*

Appendices

III. Concerns About Current County Model and Comparison to Prototype System-level Model

#1. *It is a county model used in a funding formula for school systems—twenty-eight Tennessee counties have more than one school system.*

Comptroller’s Office 2003 Report Questioned Use of County Model in BEP Formula:

“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.

Among LEAs within the same county, the ability to raise local revenue through property and sales taxes may vary considerably. The Tennessee Advisory Commission on Intergovernmental Relations (TACIR) estimates fiscal capacity only at the county level, masking these variations. As a result, some LEAs receive a disproportionately high level of state support, and others receive a disproportionately low level. More LEA-level data are now available, and it may be possible to develop an LEA-level fiscal capacity index using the same methodology and similar variables.

“Implementing an LEA-level index would not affect the BEP’s total cost, nor would the state cost change. However, an LEA-level index would cause a redistribution of state dollars and local shares of the BEP either among LEAs within a multi-LEA county or among all LEAs statewide. TACIR has examined various ways to determine fiscal capacity at the LEA level and is refining a prototype LEA-level fiscal capacity model.”

Funding Public Schools: Is the BEP Adequate? (Office of Education Accountability 2003)

Appendices

#2. *The most current data for the tax equivalent payments included in the property tax base factor are for 1995 and clearly out of date.*

Tax equivalent payments (TEPs) are revenue to local governments received from businesses that lease property from the government. TEPs may also be paid by other governmental entities that own property, but do not pay taxes to local governments. Local governments choose to lease property to businesses to attract them to locate in the area by relieving them of the obligation to pay property taxes directly. Some governments have more TEP agreements than others, so to ensure equity across the state and avoid understating tax capacity because of these TEPs it is necessary to include some measure of the value of the underlying property for which the TEPs are paid.

The current county fiscal capacity model used in the BEP formula includes such a measure, but the three years of data on which it is based is now ten years and more old. It does not accurately represent the true value of the TEPs currently in place. In the absence of more current data, no measure of TEPs should be included in any fiscal capacity model.

Appendices

#3. *Revenue from state-shared taxes is used to fund some cities' general fund transfers and, therefore, is included for them, but the same source of revenue is not included for other school systems.*

Revenue from state-shared taxes is widely used by local governments to fund Tennessee's 136 school systems.

◆ **How many school systems?**

108 for the three-year period of 2001 through 2003.

◆ **How much revenue?**

An average of \$28.2 million total per year for 2001 through 2003.

◆ **From what sources?**

Mostly TVA payments in lieu of taxes (\$20.9 billion), but also the mixed drink tax, the beer tax and the Hall income tax.

Plus revenue from state-shared taxes can be used by cities to support the appropriations they make to fund their schools. That amount cannot be determined.

The revenue per pupil on which the current county model is based includes general fund transfers made by cities for their schools. These transfers are based on all unearmarked revenue available to cities and, therefore, include some amount of state-shared tax revenue. The same type of revenue used by counties and other cities for their schools and reported explicitly by them to the Department of Education is not now included in the county model. This creates an inequity between those using general fund transfers supported in part by revenue from state-shared taxes and those using the same revenue sources and reporting it separately. Removing that inequity from the fiscal capacity model requires including both the revenue that is actually used in the revenue per pupil for each school system and the revenue available as a separate tax base factor along with taxable property and sales.

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#4. *The income data used to measure taxpayer equity—per capita personal income—includes residents in group quarters, such as college dormitories and prisons, and ‘outliers’, residents with unusually high, atypical incomes.*

According to the federal government office that produces the per capita personal income (PCI) figures used in the current county fiscal capacity model,

"the presence of a large institutional population—such as that of a college or a prison—will tend to keep the per capita personal income of an area at a lower level because the residents of these institutions have little income attributable to them at these institutions.

This lower per capita personal income is not indicative of the economic well-being of most of the residents of the area

(or, in some cases, of the institutional populations, because some of these populations, such as college students, typically receive support from their families living in other areas)."

Local Area Personal Income and Employment Methodology, 1997–2003. U.S. Bureau of Economic Analysis, <http://www.bea.doc.gov/bea/regional/articles/lapi2003/>

Averages such as the PCI can also be distorted so that they overstate the economic well-being of most of the residents of a county by the presence of one or a few residents with especially high incomes. Both problems affect small counties more than large counties, and both can be avoided by using a median instead of a mean. The only measure of median income available at the county level is median household income (MHI). The use of MHI in the fiscal capacity model removes these two sources of taxpayer inequity in the current county model.

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#5. *The service burden factor should be reconsidered in light of changes that have made the BEP formula itself a better measure of the public schools' service burden.*

Comptroller's Office 2003 Report Questioned Use of Service Burden in Fiscal Capacity Model:

- ◆ **The fiscal capacity index may at least partially “double-count” the effects of differing educational service burdens borne by counties.**

The BEP accounts in other ways for differences in the education services school systems must provide.

- *The formula generates dollars for most components based on the number of students in a system, and some components (K-3 at risk, ELL, special education) provide additional dollars based on the number of students with particular needs. Thus, it may be redundant to include the number of students in the county as part of the fiscal capacity estimation.*
- *Removing the students-per-capita variable from the statistical estimation of fiscal capacity would tend to shift local responsibility for the BEP away from the larger LEAs.*

- ◆ **The fiscal capacity index does not account for differing non-education service burdens of local governments.**

General local service burdens may need to be addressed in the measure of local fiscal capacity. Two factors . . . complicate any reformulation of the fiscal capacity index to account for municipal overburden.

- *First, data are limited. Particularly at the sub-county (i.e., LEA) level, developing a database that accurately reflects a local entity's ability to raise revenue and demands for school and non-school services is at best difficult.*
- *Second, any changes to the model will result in a redistribution of local BEP responsibility.*

Funding Public Schools: Is the BEP Adequate? (Office of Education Accountability 2003)

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New Model versus Current Model—Highlights

- Provides system-level fiscal capacity for use in equalizing system-level funding formula
- Retains regression-based modified representative tax system approach
- Retains and enhances pupil and taxpayer equity measures
 - ♦ Tax base variables include state-shared tax revenue available to fund school systems
 - ♦ Per Capita Income replaced by
 - ✓ *Median Household Income for county area—eliminates problem of group quarters and outliers in smaller counties*
 - ✓ *Child Poverty Rate for school systems—only income-related data available at that level*
- Remains a fiscal behavioral model—does not set normative standards for local revenue
- Own-source revenue includes state-shared tax revenue used to fund school systems
 - ✓ *More comprehensive—state-shared tax revenue substitutes for local revenues*
 - ✓ *Improves data integrity—state-shared tax revenue cannot be separated out of city general fund transfers*
- Service Burden (public school students divided by population) not included
 - ✓ *Inclusion criticized by Comptroller’s Office as redundant with BEP components*
 - ✓ *Model designed for use in more comprehensive BEP formula based on recommendations of Teacher Salary Task Force (enhanced funding for English language learners and at-risk students)*
 - ✓ *Adoption for use in less comprehensive BEP may require consideration of non-redundant measure*

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New Model versus Current Model Comparison of Components

Components	Current Model	New Model
Local Revenue	<i>Does not include state-shared tax revenue except in City General Fund Transfers</i>	<i>Includes state-shared tax revenues used to fund all school systems</i>
Property per Pupil	<i>County area</i>	<i>County area & school systems</i>
Sales per Pupil	<i>County area</i>	<i>County area & school systems</i>
State-shared Tax Revenue per Pupil	<i>Does not include</i>	<i>Includes state-shared tax revenues available to fund school systems</i>
Ability to Pay	<i>County-area Per Capita Income</i>	<ul style="list-style-type: none"> ♦ <i>County-area Median Household Income</i> ♦ <i>System Child Poverty Rate</i>
Resident Tax Burden/Tax Exportability	<i>County-area residential & farm assessment divided by total assessment</i>	<i>Business-related* property assessment divided by total assessment</i> <ul style="list-style-type: none"> ♦ <i>County-area ratio</i> ♦ <i>System ratio</i>
Service Burden	<i>Public School Students (ADM) divided by Population</i>	<i>Not included for adoption in more comprehensive BEP formula</i>

* Commercial, industrial, utility, and personal property.

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County and System-level Model Equations

95-County Fiscal Capacity Model

$$\begin{aligned} \text{Local Revenue per Pupil} &= \text{y-Intercept} \\ &+ \beta_1 \times \text{Property per Pupil} \\ &+ \beta_2 \times \text{Sales per Pupil} \\ &+ \beta_3 \times \text{Per Capita Income} \\ &+ \beta_4 \times [\text{Residential and Farm Assessment} \div \text{Total Assessment}] \\ &+ \beta_5 \times [\text{ADM} \div \text{Population}] \end{aligned}$$

Prototype 136-School-System Fiscal Capacity Model

$$\begin{aligned} \text{Local Revenue per Pupil} &= \text{y-Intercept} \\ &+ \beta_1 \times \text{County-area Property per Pupil} \\ &+ \beta_2 \times \text{System Unshared Property per Pupil} \\ &+ \beta_3 \times \text{County-area Sales per Pupil} \\ &+ \beta_4 \times \text{System Unshared Sales per Pupil} \\ &+ \beta_5 \times \text{System State-shared Taxes per Pupil} \\ &+ \beta_6 \times [\text{County-area Commercial, Industrial, Utility and Business Personal Property Assessment} \div \text{Total Assessment}] \\ &+ \beta_7 \times [\text{System Commercial, Industrial, Utility and Business Personal Property Assessment} \div \text{Total Assessment}] \\ &+ \beta_8 \times \text{County-area Median Household Income} \\ &+ \beta_9 \times \text{System Child Poverty Rate} \end{aligned}$$

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County and System-level Model Equations with Regression-generated Weights (Coefficients)*

95-County Fiscal Capacity Model

$$\begin{aligned} \text{Estimated Local Revenue per Pupil (fiscal capacity)} &= \$1,252 \\ &+ -0.0005 \times \text{Property per Pupil} \\ &+ 0.0140 \times \text{Sales per Pupil} \\ &+ 0.0812 \times \text{Per Capita Income} \\ &+ -\$1,772 \times [\text{Residential and Farm Assessment} \div \text{Total Assessment}] \\ &+ -\$4,650 \times [\text{ADM} \div \text{Population}] \end{aligned}$$

Prototype 136-School-System Fiscal Capacity Model

$$\begin{aligned} \text{Estimated Local Revenue per Pupil (fiscal capacity)} &= -\$22 \\ &+ 0.0047 \times \text{County-area Property per Pupil} \\ &+ 0.0048 \times \text{System Unshared Property per Pupil} \\ &+ 0.0204 \times \text{County-area Sales per Pupil} \\ &+ 0.0010 \times \text{System Unshared Sales per Pupil} \\ &+ 0.1714 \times \text{System State-shared Taxes per Pupil} \\ &+ \$570 \times [\text{County-area Commercial, Industrial, Utility and Business Personal Property Assessment} \div \text{Total Assessment}] \\ &+ \$152 \times [\text{System Commercial, Industrial, Utility and Business Personal Property Assessment} \div \text{Total Assessment}] \\ &+ 0.0130 \times \text{County-area Median Household Income} \\ &+ -\$1,399 \times \text{System Child Poverty Rate} \end{aligned}$$

* Coefficients are from models produced for fiscal year 2005-06.

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IV. Historical Time Line

October 1979: *State Equalization Plan for Financing the Public Schools in Tennessee* issued by the Tennessee School Finance Equity Study identifies the need to “utilize an equitable measure of the relative tax paying abilities of the local education agencies” in order to “determine the sharing of educational costs between the state and the local education agencies.” The study was commissioned by the Joint Legislative Committee on Elementary and Secondary School Finance established by the General Assembly in 1976.

February 1990: Performance Audit of Board and Department of Education finds that “[f]unds available for public education vary considerably from school district to school district in Tennessee.” Board and Department concur. Department notes that a formula change is being studied and includes the following comment in its response to the audit:

“Possibilities for formula change include a mechanism to distribute state funding to systems based on their “ability to pay” which would better equalize funding statewide. . . . Multiple school districts will be examined with the possibility of incorporating funding disincentives to address funding disparities.”

Board goes further, commenting on the causes and noting that the proposed new funding formula would include a system-level gauge of ability to fund schools:

“Independent taxing power of city and special school systems does contribute to the existing disparity in funding among the state’s systems. Citizens of city and special school systems have the ability and usually the will to tax themselves for the purpose of investing more in their schools. County residents may have the will but typically not the ability to do the same, given their limited tax base. The Board’s Basic Education Program proposal would resolve much of this problem by gauging state appropriations for schools to each system—county, city, or special—according to each’s ability to raise local tax revenue for schools. The result would both assure adequate resources in all systems and decrease the funding disparity among systems.”

August 1990: TACIR staff’s initial exposition of the difficulties of determining fiscal capacity for school systems in Tennessee published in a staff report titled *Fiscal Capacity of Public School Systems in Tennessee*; work on the concept had begun in the 1980s. This was the first report that presented a model to measure fiscal capacity at the school district level.

February 16, 1995: Supreme Court of Tennessee finds for the small schools plaintiffs that *exclusion of teachers’ salary increases from the equalization formula is of such magnitude that it would substantially impair the objectives of the plan; consequently, the plan must include equalization of teachers’ salaries according to the BEP formula.*

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February 27, 1995: Brent Poulton, Executive Director of the State Board of Education, writes expressing concern about the use of a county fiscal capacity model and suggesting that the overall BEP funding formula would be improved “if we could establish an index for each of the 139 school systems.”

March 8, 1995: Jane Walters, Commission of Education, writes in relation to the department’s review of teachers’ salary equalization, asking that Dr. Green to “review the issue [of fiscal capacity] and make a proposal on how [it] can be done at the school system level.”

June 1995: Requests to revise the TACIR fiscal capacity formula are brought before the Commission. Commissioner Walters notes that

if the department could distribute BEP funds on a fiscal capacity index that more accurately reflected the situation in each district, it would aid in the quest for equalization, be as fair as possible, and help the department in its continual battle over salaries and other issues where there is such great disparity.

Dr. Poulton notes that

The original premise of the BEP was that the responsibility for funding schools was split between the state and local governments. Given that local governments had different abilities to pay, local responsibility would be divided according to ability to pay. Conceptually at least, the notion was that there were 139 school systems and there would be 139 splits of that local responsibility.

Chairman Bragg asked TACIR staff to meet with department and board staff to discuss the issue further and report back at the next meeting.

June 1997: With full funding of the BEP formula set for the upcoming year, at the Commission’s request, Asst. Commissioner Roehrich-Patrick, Department of Education, presents information to the Commission as evidence of real differences in ability to pay between counties and other systems within counties. With few exceptions, city systems and special school districts have higher salaries and expenditures per student. Chairman Rochelle notes that TACIR will review the fiscal capacity model, but notes that the lack of data for income at the city and special school district level limits the effort.

June 1998: Intent to develop sub-county model included in TACIR work program.

Summer/Fall 1998: Development of one-tier and two-tier sub-county models. Staff proceeds with development of two-tier model.

Summer/Fall 2000 through Fall 2002: Discussion of municipal overburden as it relates to sub-county model; significant cross-research with Comptroller’s Office of Education Accountability (OREA).

September 2001: Prototype two-tier model presented to Commission.

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Fall 2001: favorable review of draft model by outside experts in school finance and statistics, including OREA staff.

October 2002: Supreme Court of Tennessee strikes down current funding scheme for funding/establishing teachers' salaries; work on sub-county fiscal capacity model begins again in earnest.

Fall 2002: First one-tier algebraic prototype developed by TACIR staff.

Winter 2003: TACIR staff explore alternatives to sub-county model at request of Comptroller of the Treasury.

June 2003: Commission updated on development of prototype model; concern about developing income measure at the sub-county level highlighted.

June 2003: OREA staff experimenting with two-tier, regression based, sub-county model; request feedback.

July 2003: OREA publishes *Funding Public Schools: Is the BEP Adequate?* noting that funding inequities result from use of a county-level fiscal capacity model in the Basic Education Program formula because the formula is designed to fund school systems.

September 2003: OREA and TACIR staff begin in working in concert on sub-county prototype; develop four basic alternatives:

- *two two-tier models, both w/regression-based county tier*
 - one w/algebraic second tier based solely on tax bases
 - one w/regression second tier
- *two one-tier models*
 - one algebraic based solely on tax bases
 - one full regression

October 2003: Four basic alternatives submitted to external reviewers for comments; one-tier regression version most favored; submitted to Governor's office.

October 7, 2003: Governor's salary equity task force drafts framework for recommendation of ten principles including this one: "The proposal will include a new district-level fiscal capacity model in order to provide a fairer method of determining local contribution."

October 30, 2003: TACIR submits a consensus (TACIR and the comptroller's office) prototype system-level model to Governor's office.

Winter 2004: Governor's office submits salary equity proposal to legislature that does not include prototype model.

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Spring 2004: General Assembly enacts and Governor signs salary equity bill that includes request that BEP Review Committee give special consideration to, among other things, a system-level fiscal capacity model; requires annual report each November 1.

Summer/Fall 2004: BEP Review Committee establishes subcommittees to prepare proposal for, among other things, a system-level fiscal capacity model in order to comply with legislation.

October 2004: BEP Review Committee votes to recommend, in its November 1, 2005, report, that Tennessee convert from a 95 county to a 136 system-level equalization model. BEPRC issues November 1, 2004, report with that recommendation in it.

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V. Recommendations of the Governor's Task Force on Teacher Pay—Ten Principles

1. **Select a Cost-Driven Salary Component**—Select a cost-driven component in the BEP formula for salaries that reflects a real-world average salary cost.
2. **Spend the New Funds on Salaries**—Systems below a specified instructional salary level should provide a minimum level of expenditures earmarked for instructional salaries in order to reduce disparity.
3. **Ensure a Hold Harmless Provision**—Funds should be provided to ensure that no system receives less state money than it currently does.
4. **Introduce a New District-Level Fiscal Capacity Model**—Introduce a new district/system-level fiscal capacity model in order to provide a fairer method of determining local contribution. Currently, the model measures the fiscal capacity of 95 counties. A new district/system level will measure the capacity of 136 systems.
5. **Adjust State/Local Split**—State and local shares for salaries should be adjusted to reflect fiscal realities of infusing additional state dollars and to ensure a greater degree of equalization.
6. **Require Local Responsibility**—Local systems should be required to fund their matching share of the BEP formula cost-driven salary component.
7. **Adjust the Cost Differential Factor (CDF)/At-Risk/English Language Learners (ELL) Components**—The CDF for instructional salaries should be replaced or readjusted provided that additional funds will be available to address the issue of equality of educational opportunity, including funds for students in families with low incomes (e.g., students eligible for free and reduced price lunch) and English language learners. This will have the effect of targeting funds to both rural and urban systems based on educational needs.
8. **Maintain a State Salary Schedule**—A revised state salary schedule should remain in place to ensure that there is a floor below which salaries may not fall. The schedule should be recommended by the Commissioner of Education and approved by the State Board of Education annually.
9. **Institute an Annual Watchdog/Review Component**—Charge the BEP Review Committee with annually reviewing two aspects of the teacher pay equity solution:
 - Identify any warning signs of increased disparity levels
 - Review and recommend adjustments to the BEP salary component based on recognized inflationary indices
10. **Provide a Phased-in, Multi-Year Approach**—The solution should incorporate a phased multi-year approach based upon fiscal realities and should provide local systems and local governments the opportunity to adjust to the impact.

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VI. Effect of Changes in Fiscal Capacity Factors

The relationship between fiscal capacity and specific variables (other things being equal) is illustrated as follows:

Property Assessment Increases	↑	Fiscal Capacity Increases	↑
Taxable Sales Increase	↑	Fiscal Capacity Increases	↑
State-shared Tax Revenue Increases	↑	Fiscal Capacity Increases	↑
Tax Exportability Ratio Increases	↑	Fiscal Capacity Increases	↑
Median Household Income Increases	↑	Fiscal Capacity Increases	↑
Child Poverty Increases	↑	Fiscal Capacity Decreases	↓

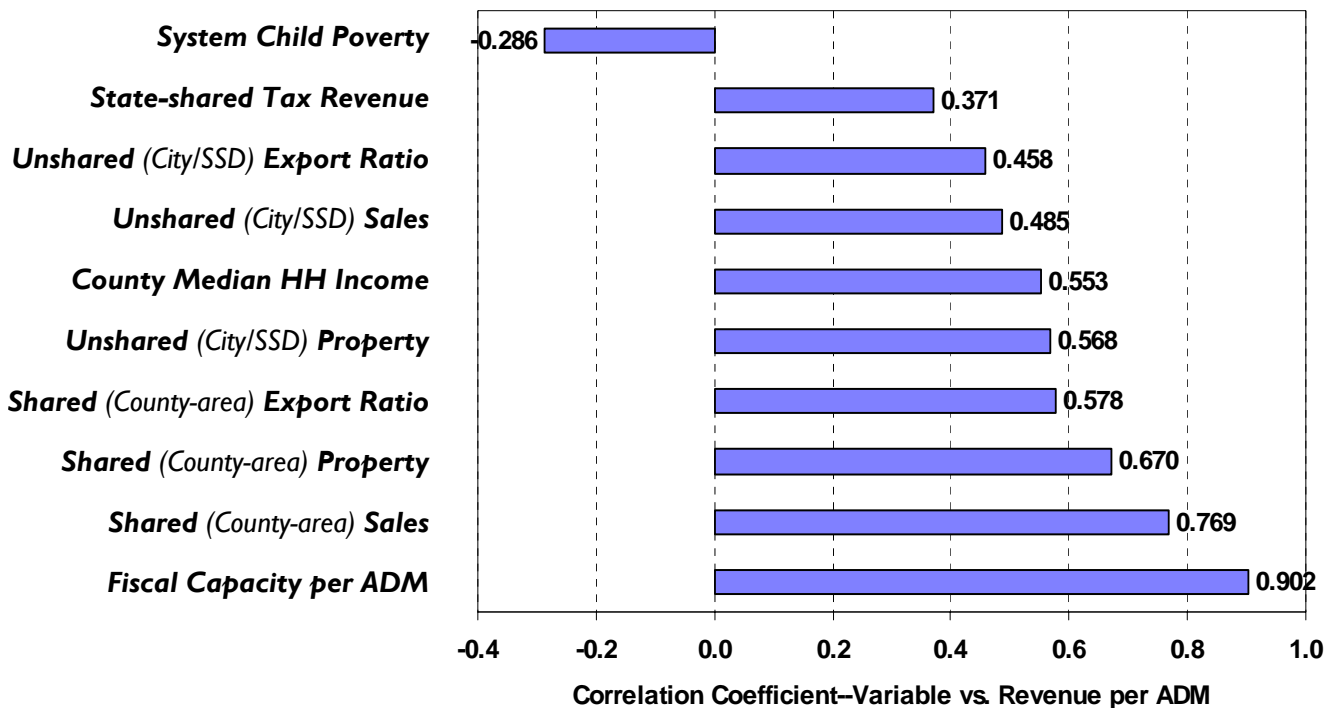
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VII. Analysis of Relationships and Dispersion of Factors

Correlation Analysis

Strength of Relationship between Fiscal Capacity Factors and Actual Revenue per Student—Correlation Coefficients

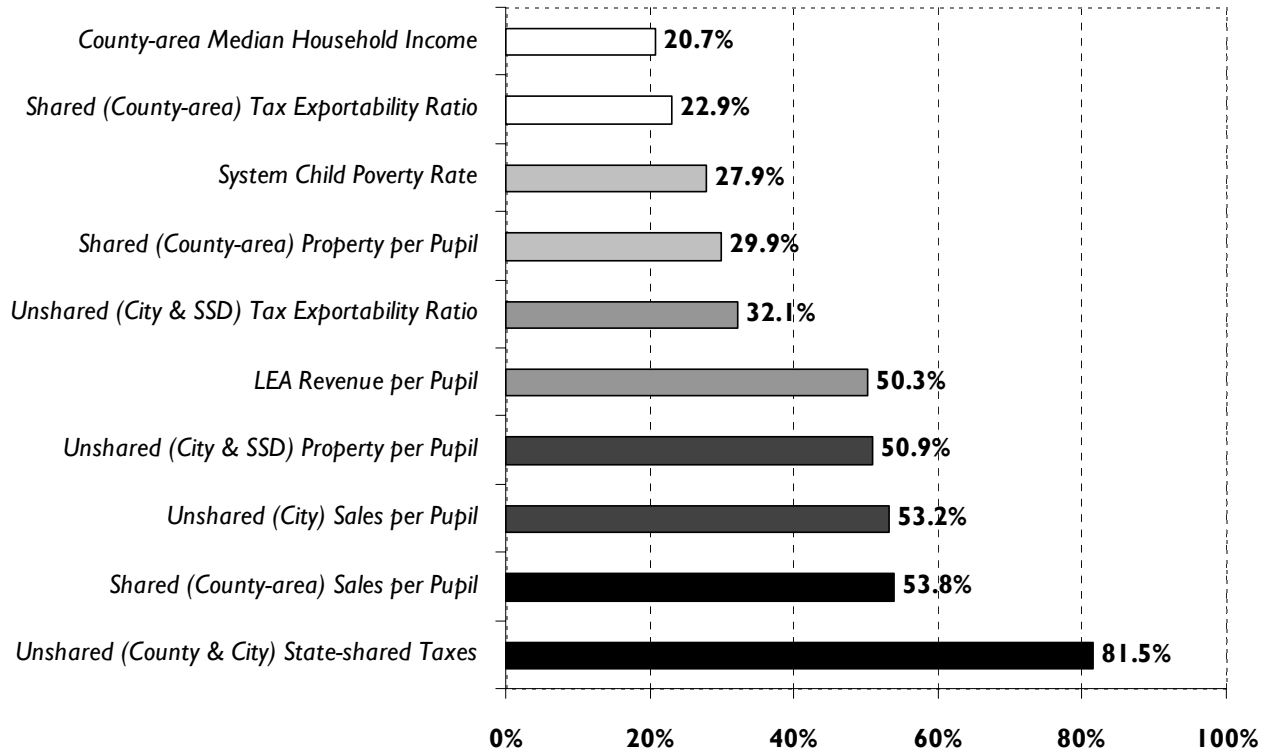


Correlation analysis is a descriptive technique used to measure the strength of the relationship between two variables. The statistic produced is called the coefficient of correlation. Values for the coefficient of correlation range from -1 for a perfect negative correlation up to +1 for a perfect positive correlation. *Perfect* means that if all the points of intersection between a pair of variables were plotted in a scatter diagram, all the points could be connected with a straight line. The closer the coefficient to either +1 or -1, the stronger the relationship. When the coefficient is near zero, little or no relationship exists. In the chart above, the longer the bars, the stronger the relationship. The factors are in order, top to bottom, from weakest to strongest. The factor with the strongest relationship to revenue per pupil is sales per ADM. The correlation coefficient for those two variables is 0.865. Per capita income and property per ADM also have strong relationships to revenue per pupil (0.824 and 0.759 respectively). The existence of a strong correlation does not imply a causation effect; it only indicates the tendencies present in the data.

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Relative Dispersion of Fiscal Capacity Factors

Coefficient of Variation



The coefficient of variation is a measure of the variation from the average value. Technically, it is the standard deviation expressed as a percent of the mean. The large COV for unshared (city) taxable sales indicates significant differences in unshared taxable sales per pupil across the 136 school systems. The small COV for county-area median household income indicates relatively small differences among the 95 counties. This indicates that the differences in the unshared sales tax base are of greater significance than the difference in median household income.

A note about shared versus unshared tax bases: Counties must share their local tax bases among all of the school systems within their borders. Cities may, but are not required to. Special school districts are not required to and typically do not. The fiscal capacity model considers only the statutory tax structure and sharing requirements. Because each variable in the model must have a value for every school system, county systems have zeros for the unshared local tax base variables. Likewise, special school districts have zeros for the unshared/city sales tax base variable and the state-shared taxes variable. Those zeros are not factored into the coefficients of variation for the unshared-tax-base variables. In other words, the coefficients of variation for the unshared-tax-base variables are based solely on the non-zero values.

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VIII. Comparability of Ability to Pay Measures

Correlation Coefficients for Alternative Measures
Based on Most Current Three-year Averages for County-level Data

	Per Capita Personal Income 1999-2001	Median Household Income 1998-2000	Poverty Rate for All Ages 1998-2000	Poverty Rate for Ages 5-17 1998-2000
<i>Per Capita Personal Income</i>	1.0000			
<i>Median Household Income</i>	0.8188	1.0000		
<i>Poverty Rate for All Ages</i>	(0.7104)	(0.8662)	1.0000	
<i>Poverty Rate for Ages 5-17</i>	(0.7039)	(0.8797)	0.9770	1.0000

Median Household Income

- Highly correlated with Per Capita Personal Income (*PCPI used in the current county model*)
- Does not include populations in group quarters (*group quarters includes college students, prison inmates, etc.*)

School-aged Child Poverty

- ***Only measure available for school systems***
- ***Highly correlated with Median Household Income***

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IX. Frequently Asked Questions

1. What is fiscal capacity?

Fiscal capacity is the potential ability of local governments to fund education from their own sources of revenue.

2. Why do we measure fiscal capacity?

Local governments cannot all raise the same revenue with the same tax rates; therefore, principles of fundamental fairness require that the state allocate its share of funding in a way that helps even things out so that residents in every part of the state are treated similarly with respect to their ability to pay taxes and the services provided there.

3. What factors determine fiscal capacity?

Essentially, fiscal capacity is determined based on the following factors:

- fiscal effort based on local revenue per student
- tax revenue capacity based on
 - ◆ equalized assessed property values per student and
 - ◆ taxable sales per student
 - ◆ revenue available from state shared taxes to fund public schools
- tax equity based on
 - ◆ the ability of individuals to pay taxes, including both
 - median household income and
 - child poverty rates
 - ◆ the ability of businesses to “export” taxes to non-residents measured by the ratio between business-related taxable property and all taxable property

4. What is the difference between fiscal capacity and fiscal effort?

Fiscal effort is the actual amount of local revenue used to support public school expenditures in relation to the ability to raise revenue for education. It depends both on revenue bases and on tax rates. Fiscal capacity is the potential amount of local revenue a local government could raise for education if it made average effort adjusted for residents’ ability to pay taxes and local businesses’ ability to export taxes to non-residents.

5. How are taxes exported?

Taxes are said to be exported when they are paid in the taxing jurisdiction by someone who does not live in that jurisdiction or when they are paid by a business in the taxing

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jurisdiction, added to the business's products or services, which are then sold to customers or clients who do not live in that jurisdiction. Taxes that are exported are not a direct burden on resident taxpayers, those who live in the taxing jurisdiction. Examples of taxes often paid by non-residents include hotel and motel taxes paid by tourists; sales taxes on purchases at regional shopping areas; and property taxes paid by manufacturers.

6. **What is the relationship between fiscal capacity and fiscal effort?**

The fiscal effort made by all school systems is a factor in determining the fiscal capacity of each individual system. What they do as a group essentially sets the standard, which is why it is called a **behavioral model**. Their **average** revenue-raising "behavior" (i.e., actual revenue per pupil) equals the average fiscal capacity per pupil produced by the model. The ability of each individual system to raise revenue for education (fiscal capacity) through tax rates that equalize the burden on resident taxpayers is estimated by measuring the relationship between actual local revenue (fiscal effort) and the various other factors affecting fiscal capacity for all systems.

Fiscal capacity is then used to equalize the local matching requirement imposed by the state's education funding scheme. If the local matching requirement exceeds actual local revenue, then actual revenue, which is the measure of fiscal effort used in the fiscal capacity formula, must increase. The effect on fiscal capacity of increases in fiscal effort by any one system is spread across all systems. No system's own effort affects its own fiscal capacity without also affecting all others.

7. **Why has TACIR produced a system-level prototype fiscal capacity model?**

TACIR staff produced the current prototype in response to a request from Governor Bredesen's Task Force on Teacher Pay and presented it again at the request of the Basic Education Program Review Committee (BEPRC) appointed by the State Board of Education. The BEPRC was asked by the General Assembly in 2004 to consider a system-level model. Interest in such a model has been expressed since the Basic Education Program (BEP) formula was first proposed by the State Board in the late 1980s. TACIR staff produced a succession of prototype models beginning then (first published in 1990), periodically refining the methodology throughout the 1990s. Staff continue to refine the model as more data becomes available and in consultation with outside experts.

8. **What is the actual output of TACIR's prototype fiscal capacity model?**

The TACIR model produces a dollar amount per pupil that the funding body for each system—based on the characteristics explained in Item 3 above—can afford to pay to fund its public schools.

9. **What is the method for determining fiscal capacity?**

Essentially, the fiscal capacity model is based on a set of averages computed from actual values for the factors listed in Item 3. The method used to compute the averages is called multiple regression analysis, which takes all of the factors (variables) and compares them simultaneously for all systems. From this process, an average weight (called a coefficient)

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is calculated for each factor. For the property and sales tax bases, this coefficient is conceptually similar to an average tax rate.

10. What is multiple regression analysis?

It is a very common and useful statistical method for addressing a wide range of issues. It is used to estimate or predict the effect of the values of a set of factors on the value of another factor that that set of factors is believed to influence. For example, multiple regression analysis is used to estimate the effect on housing prices of a combination of factors, including location, square footage, number of rooms and quality of materials. The result of this process can be used to predict the price of a house when the factors affecting price are known, but the price itself is not, for example, because it was last sold many years ago or because it is brand new and has never been sold. This same procedure is used to determine fiscal capacity by estimating the effect on actual local revenue of a combination of factors related to revenue. The result can be used to predict what the local revenue for **each** school system would be based on the effect of those factors for **all** systems.

11. Why are factors that are not statistically significant included in the model?

The model is based both on statistical theory and theories of fiscal capacity. The model includes all readily available factors that are believed to directly affect the ability of local governments to raise revenue for education. Statistical analyses other than multiple regression, such as correlation analysis, indicate that the factors in the model are related to local education revenue. The strength of these relationships is reflected in the coefficients, or weights, generated by the regression model.

Multiple regression analysis, while often taught as a method of determining the separate effects of various factors on the factor being estimated or predicted, is used here to produce estimates that correspond as closely as possible to the actual values of the factor being estimated. The difference between each actual value (revenue per pupil) and its corresponding estimate (fiscal capacity) is called the residual value. The residual value may be viewed as the amount not accounted for by the set of factors included in the model. In some cases, this may be by design. For example, the TACIR fiscal capacity model intentionally excludes any direct measure of willingness to set unusually high or low tax rates because the purpose of the model is to estimate revenue at average rates adjusted only for taxpayer equity factors. The over-arching goal is to develop a model that includes a comprehensive set of factors related to the **ability**, not the **willingness**, to raise revenue locally for public schools so that the residuals are as small as possible.

12. Why does the prototype model include both median household income and child poverty?

Both factors are measures of the well-being of resident taxpayers. Median household income (MHI) is a countywide measure, and school-age child poverty is a school system measure. MHI is used to capture the ability of all county residents to pay countywide taxes. Child poverty is used to capture the ability of residents within the boundaries of

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each school system to pay taxes applied only within those boundaries. The tax bases for both areas—county wide and within system boundaries—are separate factors in the model; therefore, ability to pay taxes on those bases must be measured separately.

13. Why does the prototype model include two factors for the property tax base, the sales tax base and tax exportability?

Different local governments independently apply different tax rates to the tax bases for counties and the tax bases for city systems and special school districts. Therefore, it is necessary to include each tax base as a separate factor. Attempts to combine the factors produce less effective models, mainly because the methods used to develop the models cannot sort out the effects of the two-level tax structure (county wide plus system level) and the sharing requirement imposed on counties. County revenue for schools must be shared with any other systems within the same county based on each system's share of the total number of students (weighted full-time-equivalent average daily attendance) in the county.

14. Why do some school systems have zero values for some factors in the prototype system-level model?

The values in the model for each school system depend on whether the factor measured plays a role in that system's fiscal capacity. For example, special school districts have zeros for unshared taxable sales because they cannot tax sales. Similarly, county school systems have zeros for unshared taxable property and sales because they cannot tax those revenue sources without sharing them with all other school systems within the county.

15. What is the effect of using tax exportability instead of tax burden in the model?

Tax exportability and tax burden are two forms of the same taxpayer equity factor. Taxes that are exported (i.e., paid by non-residents) are not part of residents' tax burden. When the percent of the property tax base that belongs to commercial and industrial enterprises or utilities (business-related property) and the percent that is a burden on residents (residential and farm property) are added together, they will always equal 100%. Either percentage will produce the same result in the model for county areas because no county area has a zero for that factor. However, because county systems have no unshared tax property tax bases, they have zeros for the property-based "unshared" taxpayer equity variable.

With tax burden ratios, low values mean high fiscal capacity so that a tax burden ratio of zero indicates the highest capacity of all. Using tax burden ratios for the system-level measure would cause a discrepancy for the county school systems because that is not what the zeros for county systems actually mean. With exportability ratios, low values mean low fiscal capacity so that an exportability ratio of zero indicates the lowest capacity of all. This is what the county systems' zeros really mean, and that is why this is the appropriate ratio for the system-level tax burden measure. If the tax burden form were used, the zeros for the county systems would be interpreted by the regression model as

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though they had greater ability to export taxes from the unshared base than the cities and special school districts. That is impossible with an unshared tax base of zero.

16. Why doesn't the prototype model include a service burden factor?

The current prototype system-level model was first developed at the request of Governor Bredesen's Task Force on Teacher Pay for inclusion with its recommendations. Those recommendations included enhancing the BEP to fund more adequately the service burden placed on local school systems. The service burden factor used in the county model is too broad a measure. It has been called "redundant" with respect to the current BEP formula without the recommended enhancements. It was omitted from the system-level model in order to eliminate the double counting that had been criticized by the state comptroller's office. The effect of double counting the service burden caused by retaining the factor used in the county model would be exacerbated if the Task Force's recommended enhancements were implemented. Nevertheless, some measure of service burden might be appropriate if it could be constructed so as not to be the same as that included in the BEP formula itself. Ideally, the BEP formula would adequately measure the education service burden of each school systems so that it would not be necessary to do so in the fiscal capacity formula.

17. Why does the prototype model include revenue from state-shared taxes?

To the extent that cities use revenue from state-shared taxes in their general fund transfers for schools, the county model includes state-shared taxes. Including all state shared tax revenue used by all local governments to fund schools treats them more consistently. Total revenue from state-shared taxes available for schools is included as a factor in the prototype model for the same reason the sales and property tax bases are included as factors: all three are substantial sources of revenue that can be used at the discretion of local officials to fund their public schools. Considerable use of revenue from state-shared taxes by local school systems is evident from the financial reports they submit to the Department of Education. This confirms conclusions by TACIR staff from their work on state-shared taxes that local governments frequently use revenue from state-shared taxes to reduce reliance on local tax bases. In this sense, state-shared tax revenue stands in the place of revenue from those tax bases.

18. How is per pupil fiscal capacity actually calculated?

The statistical method produces an average weight (called a coefficient) for each of the factors in the model. These weights are multiplied by the value of each factor for each system and summed. This produces a per pupil fiscal capacity amount for each system. These per pupil amounts are different for each system because the values of the factors are different for each system.

19. What are the timing implications of fiscal capacity?

Because of a time lag in the collection and publication of official data, the most current data available is frequently eighteen to twenty-four months old. Moreover, the formula is

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based on a three-year “moving” average of the data used. That means that each year the formula is calculated, the most current year is added and the oldest year is dropped. Consequently, a current change in the tax base of any system will not be reflected in the most current fiscal capacity index.

20. Why does the fiscal capacity model use three-year averages?

Three-year averages are used to mitigate data errors and control volatility. The original county model was based on a single year of data, and it quickly became apparent that using a single year caused large changes in the fiscal capacity estimates from year to year. Using multiple years for each data element smoothes out the changes, whether they are caused by errors in the data reported or by real increases or decreases in the values. Smoothing out increases in the data allows local governments to respond to any corresponding increases in fiscal capacity more thoughtfully over a longer period. On the other hand, smoothing out decreases that correspond to decreases in capacity delay the consequent increases in state funding. Multi-year averages were requested by the BEPRC early in the process of phasing in the BEP formula.

21. Will the fiscal capacity of each system change each year?

It is likely that there will be some change each year. However, experience with the county model shows that most changes will be insignificant. The influence of a change in the value of any one factor for any one school system may be offset or enhanced by changes in other factors and systems. A change in any single fiscal capacity factor will not necessarily mean a change in fiscal capacity based on all factors.

22. What is the fiscal capacity index (FCI)?

The State Board and the Department of Education use a percent of total measure of fiscal capacity rather than a per pupil measure. Once TACIR determines per pupil capacity for each system, this value is multiplied by average daily membership. This produces a system measure of total fiscal capacity. The values for the 136 systems are summed, and each system’s value is expressed as a percentage of the total for all systems. The fiscal capacity index for each system is this percentage.

23. Can fiscal capacity per pupil change without affecting the index?

Yes. The capacity per pupil for any one school system can move up or down without necessarily causing a major change in its index. Whether the index changes depends on the changes that occur in all 136 systems because the index is a percentage that adds to 100% for all school systems.

24. Is the FCI the same thing as my local BEP match rate?

No. Your local match rate is the result of multiplying your fiscal capacity index by the total (statewide) local share of the Basic Education Program (a dollar amount) and then dividing the result (the amount of the BEP your system must fund) by the total dollar

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amount generated for your system by the BEP formula. The total (statewide) local share of the BEP is a dollar amount that results from multiplying the statutory match rate (e.g., 50% of the non-classroom components) by the total dollar amount generated for all school systems by the BEP formula.

25. How does the Fiscal Capacity Index influence the local share of funding for each system in the Basic Education Program?

The index is the portion of total fiscal capacity for which each system is responsible. If System A has an index of 1.45% in FY 2004, then System A is responsible for 1.45% of the total local share (in dollars) of the BEP. The total local share depends on the total cost of the BEP and the local match rate set in statute. If a system's index goes up or down, that system's share of responsibility for the match changes. Changes in the fiscal capacity index have much less effect on funding than do changes in the local match rate set in statute or changes in the total cost of the BEP.

26. Why do some counties with multiple school systems have greater fiscal capacity according to the prototype system model than with the county model?

First of all, this is not unique to multi-system counties. Many one-system counties also have higher fiscal capacity in the prototype system model than in the county model. **In fact, fully half of the one-system counties have higher capacity in the prototype model.** A review of the following table, which compares actual revenue per pupil to the fiscal capacity results from both models, indicates that the county model overestimates the revenue of one-system counties as a group and underestimates the revenue of the three-system counties. It estimates the two-system counties and the two with five and six systems fairly closely:

Comparison of County-area Shares of BEP Match
to Actual Shares of Local Education Revenue
—Current 95-County Model versus Prototype 136-System Model—
by Number of Systems in County

		Percent of Statewide Local Revenue	Percent of Statewide BEP Local Match			
			Current 95-County Model	Ratio of Match to Revenue	Prototype 136-System Model	Ratio of Match to Revenue
Counties with One School System	67	49.7%	52.3%	1.05	51.3%	1.03
Counties with Two School Systems	20	40.3%	39.4%	0.98	39.6%	0.98
Counties with Three School Systems	6	9.0%	7.4%	0.82	8.1%	0.90
Counties with Five or Six School Systems	2	1.0%	0.9%	0.97	1.0%	1.05
Total	95	100.0%	100.0%	1.00	100.0%	1.00

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What we refer to as fiscal capacity is actually a statistical estimate of revenue based on variables that are related to the ability to generate revenue. The county model underestimates the total revenue of the two-system counties by about 18% and overestimates that of the one-system counties by about 5%. The prototype estimates the total revenue of each of those groups more closely. The prototype estimates for the group with the two counties that have five and six systems each are 5% higher than actual revenue, but the percent of total (1.0%) is about the same.

The fact that some counties have higher capacities according to the prototype system model and some have higher capacities with the county model illustrates some basic differences between the two models. There are a number of reasons for the different results:

- ◆ First among them is the fact that the system model has a positive coefficient for property, which better reflects the direct relationship (as one goes up the other goes up) between the property tax base and the ability to generate education revenue than does the negative coefficient for property in the county model. The negative coefficient in the county model indicates that as property values increase, revenue or fiscal capacity decreases, which is counterintuitive and appears to result from interactions among the variables in the county model, particularly property and income. This difference between the two models affects all systems, not just those in multi-system counties. The effect is strongest for the counties with the very highest and the very lowest property values.
- ◆ Second, the system model places much greater emphasis on property and much less on income. When the coefficient for income in the county model is applied to the average (un-weighted) income for the counties, the result is greater than either the actual revenue or the fiscal capacity (revenue) estimated by the model. This appears to be an offset to the negative coefficient for property in the county model, but it is hard to explain how the effect of income alone can be greater than the estimated fiscal capacity based on all variables combined.

The prototype sorts things out differently and produces coefficients (or weights) for property and income that appear more reasonable to the layperson. The result of the shift in emphasis in the system-level model away from income and toward property for systems in counties that rank high for property and lower for income is a relative increase in capacity; for systems that rank high for income and lower for property is a relative decrease in capacity. This is true regardless of the number of systems in the county and affects both one-system and multi-system counties.

- ◆ Third, the county model ignores the tax bases of cities and special school districts and is constructed as if there are only countywide tax rates in all counties. This is not the case for the approximately one third of counties that have city systems or special school districts. As a result, the statistical process that produces the county estimates must place all of the weight on the countywide variables included in the model. While the model is quite strong in relation to statistical models in general, it

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simply does not get at these sub-county systems' fiscal capacities. It is not designed to do so.

When all systems are placed on equal footing, as they are in the prototype, the statistical process can “figure out” which ones have additional capacity because of their ability to apply supplementary tax rates, that is tax rates in addition to the countywide rates. This should be expected to increase the estimates for multi-system counties and decrease them for the one-system counties, which do not have these additional rates. In most cases, it does, but in one fourth of the multi-system counties, including one of the six three-system counties and six of the twenty two-system counties, it does not. Cocke, Crockett, Hawkins, Marion, Obion, Scott, and Shelby Counties have the same or lower fiscal capacity in the prototype compared with the county model, making it implausible to draw a general conclusion that multi-system counties fare worse in the prototype model. The effect of the prototype depends on the set of variables for each system in any particular county, and a pattern is not obvious.

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X. Glossary

Ability to Pay—the ability of individuals in a certain jurisdiction to pay taxes relative to those in other jurisdictions, generally based on a measure of income. The TACIR school system fiscal capacity model uses county median household income and school district poverty rates, which are based on income, to measure ability to pay.

Child Poverty Rate—the percentage of related children living in families below the federal poverty line—as used here, it refers to school-aged children, those between the ages of five and seventeen inclusive. This is strongly correlated with income.

Fiscal Capacity—the potential ability of the school systems' to raise revenues from their own sources to pay for public education.

Fiscal Effort—the degree to which a school system utilizes the revenue bases available to it, typically measured as the ratio of between the actual amount of revenues collected or used for a particular purpose to a related measure of fiscal capacity.

Local Revenue—the amount of money provided at the discretion of local officials to support school systems, such as property taxes, and state-shared tax revenues that substitute for local revenue.

Median Household Income—the middle value among households (i.e., the value above and below which lie an equal number of households) for money income received in the previous calendar year by all household members 15 years old and over, including household members not related to the householder, people living alone, and others in non-family households.

Ordinary Least Squares Multiple Linear Regression—a statistical process used to predict the values of a dependent variable, such as local revenue for education, based on the values of a set of explanatory variables, called independent variables.

Property per Pupil—the equalized assessed valuation of property subject to taxation by local officials divided by the number of students in average daily membership.

Representative Tax System—as a measure of fiscal capacity, a method of calculating the amount of revenue that a region or government would collect if it were to exert average fiscal effort; hypothetical tax system that is representative or typical of all the taxes actually levied by the state and local governments of a federation intended to be descriptive of the state-local tax system.

Resident Tax Burden—the portion of property tax payments for which owners of homes and farms are responsible; the equalized assessed valuation of residential and farm property divided by the total taxable value of all property.

Sales per Pupil—the value of all sales subject to taxation by cities and counties divided by the number of students in average daily membership.

Service Burden—the cost of providing for public education.

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Shared Property—the equalized, assessed value of property subject to county education taxes, all of which must be shared among all school systems in the county based on the proportion of students in each system. **Note:** *all county education revenue must be shared with any and all other school systems in the county.*

Shared Taxable Sales— the value of sales subject to countywide taxes, all of which must be shared among all school systems in the county based on the proportion of students in each system. **Note:** *all county education revenue must be shared with any and all other school systems in the county.*

Shared Tax Exportability—the portion of county property tax payments for which owners of homes and farms are not responsible; the equalized assessed valuation of business-related property (commercial, industrial, utility and personal property) subject to county education taxes divided by the total taxable value of all property subject to county education taxes.

State-shared Tax Revenue per Pupil—funds provided by the State from state revenues to cities and counties to supplement funds from local sources used to provide city and county services divided by the number of students in average daily membership. Revenue sources include state sales, excise, income, beer, mixed drink, and alcoholic beverage taxes, as well as TVA payments in lieu of taxes. Only revenue from income, beer and mixed drink taxes plus TVA payments in lieu of taxes are included in school systems' financial reports. However, other revenues may be reported as "other" and they may be used to support the general fund transfers widely used by cities to fund their school systems. Therefore, the tax base variable used in the fiscal capacity model is based on all sources available for use by local governments to fund schools. **Note:** *Special school districts are not eligible to receive this revenue directly, but may receive it from counties.*

Unshared Property—the equalized, assessed value of property subject to taxes that generate revenue that is not required to be shared with other school systems. **Note:** *County school systems' revenue from this source is restricted to retirement of rural education debt and support of pupil transportation under certain specific circumstances. Such revenue cannot be used for general support of the county school system; therefore, the value of unshared property for county school systems is zero.*

Unshared Taxable Sales—the value of sales subject to taxes that generate revenue that is not required to be shared with other school systems. **Note:** *County school systems' revenue from this source is restricted to retirement of rural education debt and support of pupil transportation under certain specific circumstances. Such revenue cannot be used for general support of the county school system; therefore, the value of unshared taxable sales for county school systems is zero. Special school districts do not have authority to tax sales; therefore, the value of unshared taxable sales for special school districts is zero.*

Unshared Tax Exportability—the portion of city and special school district property tax payments for which owners of homes and farms are not responsible; the equalized assessed valuation of business-related property (commercial, industrial, utility and personal property) divided by the total taxable value of all property.

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XI. Data Sources

Local Revenue

Tennessee Department of Education, Annual Financial Reports from public school systems, fiscal years 2000-01 through 2002-03. The most recent available data will be for the fiscal year immediately preceding the year during which the Department of Education establishes funding for schools. For example, the Department establishes funding for 2004-05 during 2003-04; therefore, the most current available data on local revenue for use in that process is for 2002-03.

Student Counts—Average Daily Membership

Tennessee Department of Education, Annual Statistical Reports for school years 2000-01 through 2002-03. <http://www.state.tn.us/education/mreport.htm> The most recent available data will be for the fiscal year immediately preceding the year during which the Department of Education establishes funding for schools. For example, the Department establishes funding for 2004-05 during 2003-04; therefore, the most current available student counts for use in that process are for 2002-03.

Sales Tax Base & State-shared Tax Revenues

Tennessee Department of Revenue, fiscal years 2000-01 through 2002-03. The most recent available data will be for the fiscal year immediately preceding the year during which the Department of Education establishes funding for schools. For example, the Department establishes funding for 2004-05 during 2003-04; therefore, the most current available data on the sales tax base and state-shared taxes for use in the funding process is for 2002-03.

Property Tax Base & Ratio of Business-related Property Assessment to Total Assessment

Tennessee Board of Equalization, Tax Aggregate Report of Tennessee, calendar years 2000 through 2002. <http://www.comptroller.state.tn.us/pa/taxaggr.htm> The most recent available data will be for the calendar year ended prior to the fiscal year during which the Department of Education establishes funding for schools. For example, the Department establishes funding for 2004-05 during 2003-04; therefore, the most current available data for use in that process is for 2002.

Median Household Income

U.S. Census Bureau, Housing and Household Economic Statistics Division, Small Area Estimates Branch, Small Area Income and Poverty Estimates—Tables for States and Counties by Income Year and Statistic, 1998 through 2000. <http://www.census.gov/hhes/www/saipe/stcty/estimate.html> The most recent available data will be for the calendar year ended three years prior to the beginning of the fiscal year in which the Department of Education establishes funding for schools. For example, the Department establishes funding for 2005-06 during 2004-05; therefore, the most current available data for use in that process is for 2002, released November 2004.

Child Poverty Rates

U.S. Census Bureau, Housing and Household Economic Statistics Division, Small Area Estimates Branch, Small Area Income and Poverty Estimates—School District Estimates, 1997, 1999 and 2000. <http://www.census.gov/hhes/www/saipe/schooltoc.html> The most recent available data will be for the calendar year ended three years prior to the beginning of the fiscal year in which the Department of Education establishes funding for schools. For example, the Department establishes funding for 2005-06 during 2004-05; therefore, the most current available data for use in that process is for 2002, released November 2004.

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Schedule of Data Availability

	2000	2001	2002	2003	2004	2005	2006
<i>BEP Funding Year</i>							X
<i>Student Counts (ADM)</i>			X	X	X		
<i>Local Revenue</i>			X	X	X		
<i>Taxable Sales</i>			X	X	X		
<i>Taxable Property</i>		X	X	X			
<i>State-shared Tax Revenue</i>			X	X	X		
<i>Median Household Income</i>	X	X	X				
<i>Child Poverty Rates</i>	X	X	X				

- **Calculations of funding through the Basic Education Program (BEP) formula are made during the fiscal year prior to the year in which funding is to be provided.** Because the calculations are made before the end of the prior fiscal year, no figures for the year during which those calculations are made are available for that purpose; therefore, the latest available data is always from two years prior to the year being funded. Moreover, data reported on a calendar year basis, which includes property, median household income and child poverty, will always be another six months behind. And figures from the federal government, which include median household income and child poverty, will lag further behind because they are based on a wide array of data and complex estimation processes.
- **Three-year averages are used for each factor by agreement with the BEP Review Committee appointed by the State Board of Education in order to mitigate any volatility that might be inherent in the data.** The most volatile data is typically the property tax base because of periodic and unpredictable challenges to the assessed valuations established by county appraisers.

Addendum

System-level Effects