

# A Users' Guide to Fiscal Capacity in the Basic Education Program Funding Formula

## Introduction

### *What is fiscal capacity?*

Fiscal capacity is a measure of the potential ability of a particular government to generate revenue from their own sources relative to other similar governments. Fiscal capacity indicators are used mainly for

- ◆ regional analysis
- ◆ regional policy
- ◆ comparative fiscal policy analysis, and
- ◆ fiscal equalization policy.

Indicators for comparing states were discussed in TACIR's report *Measuring Fiscal Capacity: Tennessee Compared to Southeastern States* (1997) and include

- **gross state product**, the state counterpart to gross national product, typically used to monitor changes over time
- **per capita personal income**, defined as consumption of a person, family or household **plus** the change in its net worth over a given period of time
- **total taxable resources**, a combination of gross state product and per capita personal income done in a way that avoids double counting between those two measures
- **export-adjusted income**, a theoretical approach intended to account for taxes paid by non-residents
- **representative tax or revenue system**, designed to measure statutory tax bases that are commonly taxed by state and local governments



### **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

**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 and statistical errors.*

**VIII**

*Fiscal capacity should reflect adjustments for variables that cause differential costs.*

The first four methods listed above may be characterized as indicators of individuals' ability to pay taxes; the fifth method focuses more on the ability of governments to raise revenue based on comprehensively defined tax bases and average tax rates.

Tennessee uses a modified version of the representative tax system (RTS) to measure fiscal capacity for the state's education funding formula in order to equalize funding across the ninety-five counties. Fiscal capacity is distinctly different from fiscal effort. Capacity indicates what a government can do, not what it actually does. Governments cannot change their own fiscal capacity by changing their tax rates. Fiscal capacity based on the RTS method depends on the revenue raised by all governments combined.

Not every county can raise the same amount of money per citizen with the same tax rates. The value of property varies from county to county as does economic activity in general. The main sources of revenue for local governments in Tennessee are property and sales. Together, these make up more than ninety-seven percent of all education revenue.

**Why does fiscal capacity matter?**

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's required. That creates a taxpayer equity problem.

So how does the state solve that problem and ensure equity for residents across the state? By adjusting the share paid by each local government to reflect the size of its tax base. This is where fiscal capacity comes in. Only if a way can be found to measure differences between local governments in their ability to raise revenue to match the state funding can the state ensure that all taxpayers are treated fairly. Tennessee has chosen to use a representative tax system model for that purpose. The State Board of Education adopted the model developed by TACIR to allocate the local share of the BEP formula across counties.

### **Property Taxes**

The ability to tax property in Tennessee is mainly restricted to cities and counties. The state does not directly tax property. Cities and counties tax both real and personal property, but not personal property owned by individuals and not used in a business. Property values are divided into several different classes and assessed at different rates. For example, only twenty-five percent of the fair market value of residential property is taxed, but forty percent of the value of commercial property is taxed. The same tax rate is applied to all types of property, but those different assessment rates mean that the full value of residential property is not taxed as heavily as commercial property. These differences contribute to the differences across counties in the amount of revenue that can be raised by the same property tax rate.

When comparing the power of the local property tax base, people often speak in terms of what a penny will generate. That is because property tax rates in Tennessee are usually described in terms of dollars [and cents] per hundred dollars of taxable property value, and tax increases are usually described in cents. The amount of revenue a particular local government can raise with a penny on the property tax base varies considerably across Tennessee. These amounts are sometimes used to describe the relative wealth of the state's ninety-five counties, but they are only part of the story.

Counties that operate school systems must set a property tax rate for schools separate from the rate they set to fund the rest of county government. Cities that operate school systems typically

**Property tax rates in Tennessee are usually described in terms of dollars [and cents] per hundred dollars of taxable property value.**

**Tax increases are usually described in cents, hence the question:**

**“What will a penny generate?”**

<p>No local sales tax rate can be higher than 2.75%.</p> <p>No city or county can tax more than \$1,600 of the price of any one item.</p>	<p>do not. They may transfer money from the general fund for their schools. In that case, it is impossible to tell how much of the money is from property taxes or any other tax. There is no limit on the property tax rate local governments can set, but most range between two and four dollars per hundred dollars of assessed value.</p> <p>Generally, property tax rates are set by the elected governing bodies of cities and counties (i.e., city councils and county commissions). But Tennessee also has a number of special school districts that have been established by the state legislature. The elected boards of these districts can also impose property tax rates for schools, but only up to the limit set by the legislature.</p> <p><b>Sales Taxes</b></p> <p>Both the state and local governments can tax sales, but local governments cannot raise their rates above 2.75% or two-and-three-quarters cents per dollar of purchase price, and they can tax only the first \$1,600 of the purchase price of any individual item. The \$1,600 single article cap, as it is called, means that no matter the price, the most a local government with a tax rate of 2.75% can collect on the purchase of any one item, even an item as expensive as a car, is \$44. If you buy a car that costs \$5,000, you will pay the same \$44 to the local government as someone who buys a car that costs \$50,000. In contrast, if you buy \$5,000 worth of building materials to build a house—so long as no single item costs more than \$1,600—you will pay the local government \$137.50; and if you buy \$50,000 worth of building materials to build a house, you will pay \$1,375.00.</p> <p>The selection of things for sale varies greatly from county to county in Tennessee, and so people often cross county lines to find the things they want to buy, both goods and services. Some counties do not have large discount stores; some don't even have a single new car dealership. Because of this, just as with property, the amount of money that any particular county can raise through a sales tax varies greatly. In fact, the amount that can be raised per citizen from sales taxes varies around the state more than the amount that can be raised from property taxes.</p>
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Local sales tax rates are set by referendum, so individual citizens get to vote on whether to approve increases. Proposals to increase sales tax rates often include information about how the local government intends to spend the additional money raised by the new rate. The most common reason given is to fund schools. As with property taxes, cities ordinarily do not set specific rates for schools, but transfer money from the general fund for them instead, so it is rarely possible to determine how much sales tax revenue cities use to support schools.

**Other Local Taxes**

One other tax is widely used by local governments—counties in particular—to fund schools: the wheel tax. Wheel tax rates vary from county to county much more widely than property or sales tax rates, but generate far less money. Local governments also use business taxes and other taxes and fees to support schools, but these typically generate even less revenue than wheel taxes.

**What is the TACIR Fiscal Capacity Model?**

Tennessee’s fiscal capacity model was developed by TACIR and adopted by the State Board of Education to fulfill the requirement of the Education Improvement Act for fiscal equalization in the Basic Education Program (BEP). It is used to help determine the local funding shares for each school system. Fiscal capacity is the potential ability of local governments to fund education from their own taxable sources, relative to their cost of providing services.

The TACIR formula estimates the dollar amount per pupil that each county area can afford to raise to fund its public schools. The dollar amount per pupil is multiplied by the number of students in each county to produce the total fiscal capacity for each county area. The total fiscal capacity for all ninety-five counties is summed, and the amount for each county is divided by the statewide total. This amount is called the fiscal capacity index. Converted to a percentage of the statewide total, this number constitutes the share that each county has of total statewide capacity to fund education from local sources.

**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.
- Three-year Moving Average—mitigates both errors and volatility in the data.

### ***A Modified Representative Tax System Approach***

TACIR uses a modified version of the representative tax system (RTS) approach to determine fiscal capacity developed by the U.S. Advisory Commission on Intergovernmental Relations (ACIR). The original ACIR model estimated the fiscal capacity of states by applying uniform tax rates to a standard set of tax bases. The TACIR model enhances the basic RTS approach by using a common statistical method to expand the formula to include more measures of taxpayer equity and a measure of the local service burden.

The statistical method TACIR uses to compute each county's fiscal capacity is called multiple regression analysis. This method starts with the actual revenue raised by all ninety-five counties for education. It then takes each factor (variable) and compares it across all counties to produce a weight (called a coefficient) that represents the average contribution that factor makes to the amount raised by each county. A single weight is calculated for each factor included in the model. Each weight is multiplied by the value of the factor for each county and summed for that county to produce a dollar amount per pupil. That amount represents the fiscal capacity for the county. These amounts vary county-by-county because the values of the factors are different for each county.

### ***A Fiscal "Behavioral" Model***

The TACIR fiscal capacity formula is called a "behavioral model" because it is based on the amount of revenue actually raised for education by local governments in Tennessee. It does not attempt to determine how much should be raised based on some external factor or policy, nor does it begin with a target amount and determine how to allocate it. It uses the actual amounts from all counties to estimate the amount that could be raised in each individual county based on the weights produced by comparing all of the factors for all counties combined. Models based on some external determination of how much money should be raised are called "normative models".

The TACIR fiscal capacity model is "behavioral" because it starts and ends with what locals are actually doing collectively—the average across counties for the estimates equals the average of the counties' actual revenue per pupil.

### ***A Pupil Equity Model***

The TACIR model is called a “pupil equity model” partly because the revenue and tax base factors are expressed in terms of amounts per pupil and partly because it includes a separate factor to measure the service burden in each county. This factor is the ratio of public school students to the total population of the county. The student count used is called “average daily membership,” which is the average number of students over the course of the year.

### ***A Taxpayer Equity Model***

TACIR’s model is called a “taxpayer equity model” because it is designed to ensure that all taxpayers similarly situated are asked to pay the same amount. It does this by including tax base measures and a measure of the burden placed on residents by the tax structure. The primary tax bases for local governments in Tennessee are property and sales. The measure of the resident tax burden is the total taxable value of all residential and farm property divided by the total taxable value of all property in the county.

### ***Three-year Moving Averages***

The fiscal capacity formula uses three-year “moving” averages for each factor, including actual revenue, which means that three years of data are used and each year the oldest data is dropped and more recent data is added. This averaging helps “smooth out” major changes in the model’s results and reduces volatility from year to year. However, using a three-year moving average increases the normal time lag that results because the fiscal capacity estimates have to be produced in time to be used in the BEP formula. The most recent data is never more current than the year before the BEP is calculated, and because of the time it takes to collect and prepare data, the most current data used is often eighteen to twenty-four months old.

**How Are the Components of Fiscal Capacity Measured?**

All of the factors used in the TACIR fiscal capacity model are based on the most current three-year averages available. The local revenue and tax base factors are divided by the number of public school students in each county. The student counts used for this purpose are the same as the counts used in the service responsibility component.

**Fiscal Capacity Model Components and Factors**

Components		Factors
Local Revenue	↔	Own-source Revenue per Pupil
Tax Base (Pupil Equity)	↔	Taxable Sales per Pupil Property per Pupil
Ability to Pay (Taxpayer Equity)	↔	Per Capital Income
Resident Tax Burden (Taxpayer Equity)	↔	Ratio of Residential & Farm Assessment to Total Assessment
Service Responsibility (Pupil Equity)	↔	Ratio of Average Daily Membership to Population
Methodology	↔	Ordinary Lease Squares Multiple Linear Regression
Output	↔	Fiscal Capacity per Pupil

**Local revenue** in the fiscal capacity model includes all own-source revenue used by local governments to fund education. For county school systems, this includes mainly revenue from local sales and property taxes. Counties with more than one school system must share this revenue, as well as any other revenue from local sources, with the other school systems in the county.



In addition, any special school districts in the county, with the exception of the Memphis Special School District,\* can levy their own property taxes; cities can either levy specific taxes or more commonly make appropriations for their schools from general fund monies. When cities make general fund transfers, it is impossible to determine the exact source of funds, but they may include revenue from state-shared taxes, as well as from locally imposed taxes. The data is collected each year by the Tennessee Department of Education.

**Tax base** components include the two main sources of local revenue for education:

- the equalized assessed value of all taxable real and personal property in each county and
- the local taxable sales in each county.

Property values are obtained from the Comptroller of the Treasury, Division of Property Assessments. They are reported on a calendar year basis. The value of taxable sales is obtained from the Department of Revenue, and it is reported on a fiscal year basis.

Also included in the property tax base factor for each county is the latest data on tax equivalent payments from the Comptroller's Division of Local Finance. Tax equivalent payments are also called payments in lieu of taxes, which local governments often receive in exchange for special accommodations for new or expanded businesses. Unfortunately, the most current information available on these payments dates back to 1995.

**Ability to pay** is based on per capita personal income (PCPI). PCPI is provided by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA). The BEA defines personal income as income received by persons from all sources. It is reported on a calendar year basis. PCPI also acts as a proxy for local revenue not derived from property or sales taxes, such as wheel taxes.

**Resident taxpayer burden** is measured by dividing the combined value of residential and farm property by the value of all taxable

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\* The city of Memphis provides funds for the Memphis special school district.

**Personal Income—a measure of ability to pay**

- compensation received by employees
- proprietors' income
- rental income
- income receipts on assets
- current transfer receipts
- less contributions for government social insurance

property in the county. These values are included in the data set obtained from the Division of Property Assessment. The use of this factor to measure the resident taxpayer burden rests on the theory that taxes on residential and farm property are paid entirely by county residents, while taxes on commercial and industrial property may be recouped from non-county residents through the sale of products and services to customers outside the county, a concept known as tax exporting. A high ratio of residential and farm property to all property indicates a relatively low capacity to export taxes and, consequently, a relatively high resident tax burden. A low ratio indicates a relatively low resident tax burden and a higher capacity to export taxes.

**Service responsibility** is measured by dividing the number of students in public schools by the entire population as reported by the U.S. Census Bureau. The student count used is the average daily membership (ADM) obtained each year from the Department of Education. This component has long been included in TACIR's fiscal capacity model to reflect expenditure needs. Over time, the BEP formula has become more comprehensive in its own right, and this component of the fiscal capacity formula has become less important. That is, it has come to have less influence on the estimates produced by the model.

### ***How Are the Factors Combined to Estimate Fiscal Capacity?***

The TACIR fiscal capacity model is based on a commonly used statistical process called "ordinary least squares multiple linear regression", which sounds more intimidating than it is. In fact, it is built into the spreadsheet software included in the most commonly used office automation packages, even those sold for home use. Linear regression is a method used to compare two or more factors to determine the mathematical relationship between them. If one increases, does the other increase or decrease? If so, how much?

Multiple linear regression is a method for comparing a factor to two or more other factors. It is a complex formula that takes a set of data and produces a set of weights that can be multiplied by a set of factors to estimate another factor. These weights represent

the amount by which each factor increases or decreases as the factor being estimated increases. This process also produces a set amount, called a constant because it is the same for every observation (county in this case), that is included in each estimate.

In the case of education fiscal capacity, the factor being estimated is the amount of local revenue that could be raised in each Tennessee county based on the actual revenue raised by all counties and the factors listed in the next chart. The chart includes the state average for each factor and its weight based on the most recent model.

**2004-05 County Fiscal Capacity Factors and Weights\***

<b>Average Actual Revenue per Pupil: \$1,576</b>		
<b>Factors used to estimate Revenue per Pupil</b>	<b>Average County Value</b>	<b>Weights Produced by Model</b>
Constant Value to be Included in Each County's Estimate	n/a	\$1,098
Taxable Property per Pupil	\$82,876	-0.0012
Taxable Sales per Pupil	\$39,843	+0.0138
Per Capita Personal Income	\$20,879	+0.0783
Ratio of Residential and Farm Value to Total Taxable Property	65.32%	-\$1,496
Ratio of Average Daily Membership to Population	15.87%	-\$3,982
<b>Average Estimated Revenue per Pupil: \$1,576</b>		

\*Averages in this table are based on the values for each of the ninety-five counties.

The weights produced by the regression model are unique to a particular set of data. Each year as the data is updated and the values for each factor included in the model change, the weights, as well as the constant, will change. This happens because all of the three-year-average values for each county change each year, and they do not all change at the same rate for all counties. The expected effects of changes in the factors on estimates of fiscal capacity are shown in the following chart:

### 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	↑
Per Capita Income Increases	↑	Fiscal Capacity Increases	↑
Tax Burden Ratio Increases	↑	Fiscal Capacity Decreases	↓
ADM/Population Ratio Increases	↑	Fiscal Capacity Decreases	↓

These changes are moderated by the use of three-year averages. In order to have the most current data possible for each factor in the fiscal capacity model, the model does not become available until about six months prior to the beginning of the fiscal year to which it applies. Moreover, in order to have the most current values for use in the BEP formula, mainly the student counts on which BEP funding is based, the Department of Education waits until June or July each year to make final funding determinations for school systems. The moderating effect of three-year averages makes it easier for local governments to deal with this time line. But while it ensures against rapid increases in fiscal capacity, it also delays decreases. This is important to local governments because the Department uses a fiscal capacity index derived from the per pupil estimates produced by the model. The index form is necessary because the local match required by the BEP is distributed across counties based on each county's share of local fiscal capacity.

### How is the Fiscal Capacity Index Computed?

The BEP formula, the state's primary method of funding public schools, requires an index expressed as a percent of total local revenue to allocate responsibility for the local matching requirement across Tennessee's ninety-five counties. But the regression model used TACIR produces a dollar amount per pupil. The entire process, from fiscal capacity per pupil to a fiscal capacity index requires four basic steps:



TACIR fiscal capacity index is used to allocate that difference fairly across all counties. Computing the local requirement for each county is a simple process of multiplying three numbers:

<b>County Matching Requirement</b>	=	<b>Statewide BEP Cost</b>	x	<b>Statutory Match Rate</b>	x	<b>County Fiscal Capacity Index</b>
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This simple three-part calculation is all that is necessary for the sixty-seven counties that have only one school system. For the other twenty-eight counties, the local match has to be allocated among multiple systems. It can easily be allocated based on the share each system has of the total BEP cost for the county. For example, if one system has half the BEP total for the county, that system is responsible for half of the local match. This method of allocation has nothing to do with the within-county systems' fiscal capacity relative to each other or relative to systems in other counties. Sample calculations for both single-system and multi-system counties are included in the Appendix.