



## POLICY BRIEF

# Providing Adequate Funding Through Equitable Taxation

## An Introduction

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State school finance systems have two primary goals: to generate sufficient resources such that all children have equal opportunity to achieve adequate outcomes (resource adequacy and equity) and to raise revenues capable of providing these resources through a fair system of taxation (tax equity). Although prior briefs in this series have concentrated on resource equity, here we outline the principles of tax equity and address the challenges of achieving both goals simultaneously.

State school finance systems derive revenues from local, state, and federal taxes. Under most state school finance systems, local revenues are raised by property taxes. State aid may come from a variety of sources including, but not limited to, individual and corporate income taxes, sales taxes, and statewide property taxes on all or select property types.

Where local revenue is raised by property taxes, the amount of revenue is the product of the tax rate and the assessed valuation of property. Left to their own devices, local communities will raise what they can, given their preferences for educational investment and capacity to raise revenue, to provide for a local system of schools. This means that higher poverty communities with low assessed property values often cannot raise as much local revenue on a per-student basis as more affluent, high-wealth communities, even if they choose to impose higher tax rates.

State aid to local public school districts can therefore be viewed as a form of local property tax relief because a dollar provided in state aid is a dollar that does not need to be raised with local property taxes. State aid to high-poverty districts can simultaneously (a) reduce the burden on local taxpayers to fund their schools and (b) increase school spending to more adequate levels, leading to a more equitable distribution of funding. The challenge is to create a system that optimizes the balance between state and local revenues.

### Goal 1: Resource Adequacy and Equity

In our accompanying briefs, we emphasize that the goal of state school finance systems is not to provide equal dollars per pupil across districts but, rather, to provide the spending needed so that children have equal opportunity to achieve desired outcome goals. We can use the methods and models laid out in prior briefs to generate these spending estimates, which show both the variation in need across districts and

the degree to which actual spending aligns with student need. In this section, we outline two methods for measuring resource equity across districts: the cost index and the weighted pupil index.

The cost index shows how much the cost of providing an adequate education for a given district differs from the state average. Using the cost model directly, one can create a comprehensive cost index by dividing each district’s predicted cost per pupil of an adequate education by the predicted cost per pupil averaged across all districts as follows:

$$(1) \quad \text{Cost Index}_{\text{district}} = \frac{\text{Predicted Cost Per Pupil}_{\text{district}}}{\text{State Average Predicted Cost Per Pupil}}$$

A district in which per-pupil costs of achieving an outcome goal are 50% higher than the average district in the state would have a cost index of 1.5, while a district in which per-pupil costs are 80% of average costs (20% less than average) would have a cost index of 0.8.

To evaluate how actual spending differs from predicted costs, we can adjust existing spending by the cost index as follows:

$$(2) \quad \frac{\text{Cost-Adjusted Spending Per Pupil}_{\text{district}}}{\text{Spending Per Pupil}_{\text{district}}} = \frac{\text{Spending Per Pupil}_{\text{district}}}{\text{Cost Index}_{\text{district}}}$$

If resources were allocated to achieve equal opportunity, each district’s actual spending per pupil would be equal to its cost per pupil (i.e., the cost of providing an opportunity for its unique mix of students to achieve the desired outcome goals). In this case, the cost-adjusted spending per pupil would be the same in all districts. Districts in which cost-adjusted spending per pupil is relatively high are receiving more than their fair share of statewide resources, while districts with low cost-adjusted spending are receiving less than their fair share. In other words, districts with low cost-adjusted spending per pupil are not receiving sufficient resources to achieve equal opportunity, given the needs of the students served and the structural or geographic characteristics (cost factors) of the district.

Although the cost index uses the cost model estimates directly, in practice we recommend developing a weighted pupil formula that emulates the cost model predictions with a smaller set of cost factors and can be more easily translated into a state funding formula; this is the approach we took in our prior research with Vermont (Kolbe, Baker, Atchison, & Levin, 2019). A weighted pupil formula creates a weighted pupil count by summing the additional costs associated with individual student characteristics (such as being an English learner (EL) or living in poverty) and converting districtwide costs (including small district costs, sparse population costs, and labor costs) into additional weighted pupils for funding purposes. For example, each EL might receive a weight of 1.5, meaning that each EL student is counted as 1.5 students for the purposes of calculating a district’s funding. In small districts, the total student count might be adjusted upward by a factor of 1.1 to reflect the higher per-pupil cost of operating on a small scale.

Weighted pupil counts can also be converted into an index (the weighted pupil index [WPI]) by dividing the weighted pupil count by actual enrollment:

$$(3) \quad \text{Weighted Pupil Index}_{\text{district}} = \frac{\text{Weighted Pupil Count}_{\text{district}}}{\text{Actual Enrollment}_{\text{district}}}$$

Because the count of weighted pupils must be equal to or exceed the count of actual pupils, the weighted pupil index will always be greater than 1. Therefore, the interpretation of the weighted pupil index is different from the comprehensive cost index, which has an average of 1, with some districts above and others below 1. Rather than indicating the cost relative to an average district (as with the comprehensive cost index), the weighted pupil index indicates the cost relative to a district with the minimum possible cost (i.e., a district with no students with additional needs, that is sufficiently large, and is not located in a sparsely populated area). In terms of dollars, the weighted pupil index represents an upward adjustment of the base per-pupil funding amount. As with the cost model index itself, the weighted pupil index can be used to calculate a cost-adjusted spending level:

$$(4) \quad \frac{\text{Cost-Adjusted Spending Per Pupil}_{\text{district}}}{\text{Spending Per Pupil}_{\text{district}}} = \text{Spending Per Pupil}_{\text{district}} / \text{Weighted Pupil Index}_{\text{district}}$$

To make these terms more concrete, Table 1 shows an example using our recent analyses for Vermont. Looking at the first two columns, we see that weighted and unweighted (actual) enrollments differ substantially across the districts presented. In Rutland City, a district with a relatively high child poverty rate, actual enrollment is less than 2,000 (1,964). After summing all the additional costs associated with student population characteristics and district cost factors, however, Rutland has a weighted pupil count of 4,894, leading to a weighted pupil index of 2.49 (calculated using per equation 3, equal to 4,894 divided by 1,964). The Norwich (Hanover) interstate district has much lower average student needs and thus has the lowest weighted student index of 1.25.

**Table 1. Vermont Example of Weighted Pupil Equity Analysis**

LEA	PK–12 Enrollment	Total Weighted Pupils	Weighted Pupil Index	Weighted Funding per Pupil	Actual Spending per Pupil	WPI Adjusted Spending
Brattleboro	887	1,743	1.97	\$17,045	\$15,079	\$7,669
Burlington	3,918	8,731	2.23	\$19,318	\$15,694	\$7,042
Norwich	595	741	1.25	\$10,803	\$18,482	\$14,831
Rutland City	1,964	4,894	2.49	\$21,601	\$16,139	\$6,477
Springfield	1,252	2,663	2.13	\$18,442	\$17,386	\$8,172

Notes: Transportation, spending from federal revenue sources, and several other types of spending that are not used in the calculation of local tax rates in Vermont are excluded from the weighted funding per pupil and actual spending per pupil. WPI adjusted spending is the actual spending per pupil divided by the weighted pupil index.

Source: Kolbe, Baker, Atchison, & Levin, 2019.

The fifth column of Table 1 (Weighted Funding per Pupil) shows how much districts would need to spend on a per pupil basis to meet the desired outcome goals under the weighted formula, excluding certain spending components such as transportation and federal funds. These numbers vary substantially, from \$10,803 per pupil in Norwich to \$21,601 per pupil in Rutland. If we divide these projected costs by their

respective weighted pupil indices, we calculate an amount of approximately \$8,668 for each district, which represents the base funding amount per pupil in the weighted student funding formula.<sup>1</sup>

In reality, Vermont districts do not spend at the target levels identified in our study. The second to last column of Table 1 shows that Norwich, which has the lowest weighted pupil index, actually has the highest spending per pupil. When we divide each district's actual spending per pupil by their weighted pupil index (WPI adjusted spending, last column), we get a better picture of how the opportunity to achieve a given set of outcomes varies across districts. If each district spent what was needed to achieve common outcomes, the dollar values in the last column would all equal the base per-pupil funding amount of \$8,668. Instead, we see that WPI adjusted spending in Norwich is \$14,831, meaning that Norwich received nearly double the funding needed to achieve the outcome target used in the Vermont study. In contrast, WPI adjusted spending in Rutland City is only \$6,477 and is well below the base funding level.

In Vermont, school spending is still largely up to local district discretion. The state does not (yet) use the cost model we estimated to establish spending targets, and the design of their funding formula does not mandate that local school districts spend at specific target levels. Rather, the formula provides that districts *could* achieve target spending levels if they adopted a common equalized tax rate. We now turn to the second goal of tax fairness to examine how resource equity can be achieved through equitable taxation.

## Goal 2: Tax Equity

Now that measures of resource equity have been established, the next step is to define measures of equitable taxation. Equitable taxation must be achieved across communities within the state as well as across individuals within communities. Often, the focus of state school finance systems, and state aid formulas specifically, is on equalizing local property taxation across school districts. That said, finance systems should not overlook tax equity with respect to generation of statewide education revenues, even as these revenues are used for achieving greater equity in local property taxation.

Property taxes paid across municipalities and local public school districts may be measured in multiple ways:

- **Nominal (adopted) tax rates:** Adopted tax rates are the nominal rates, or percentages, that are applied in the calculation of the tax bill.
- **Effective tax rates:** Effective tax rates show the actual tax paid as a percentage of the actual value of the tax base (for property taxes, the base is the total current market value of property; for income taxes, it is unadjusted gross income). These figures will differ from nominal rates for a variety of reasons, most having to do with the denominator. When calculating tax bills, many states will tax only a portion of the full market value of properties, with different portions for different types of properties (e.g., commercial versus residential property). Similarly, income taxes are applied to adjusted income levels after deductions are made (e.g., for charitable contributions, childcare payments, etc.) rather than gross income levels. For property taxation, the timeliness and accuracy of market value

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<sup>1</sup> The calculated base funding amount is not exactly the same in each district because of variation in the amount of spending excluded from the weighted funding per-pupil calculation (e.g., for transportation or from federal sources).

appraisals may differ across jurisdictions, creating additional variation in the amount of tax paid.<sup>2</sup> Effective tax rates based on up-to-date and unadjusted values are useful for uncovering these distortions, many of which are the result of policy decisions.

- **Tax price:** The “tax price” is the amount of taxes paid by the individual taxpayer to raise an additional \$1 in revenue. For school finance, tax price is most often discussed in relation to local property taxes and the distribution of commercial and industrial properties across jurisdictions. In a city or town in which 100% of the taxable property is residential, it takes \$1 in property taxes per household to raise \$1 in revenue per household. If 20% of taxable value is in commercial or industrial property, however, residential property owners pay only 80 cents to raise \$1 in revenue. The uneven distribution of commercial and industrial properties across jurisdictions is a major cause of differences in tax price, leading to variations in the effective and even nominal tax rates required to raise similar revenues.
- **Taxes paid as a share of income (effort):** Ultimately, even property taxes must be viewed through a lens of ability to pay, which is often best measured by income. Resident owners of high-value properties may, for example, be retired and on fixed income. Many states provide exemptions and/or caps on property taxes to reduce or limit the share of income these residents pay in property taxes.<sup>3</sup> Of course, these exemptions also affect the tax price (and effective and nominal tax rates) paid by other residents of the same jurisdiction who are not eligible for such exemptions. Thus, it is useful to measure how tax effort varies both within and across communities, and particularly by income class, to identify which populations face the highest burden of funding adequate school spending.

Nominal tax rates are the most accessible, but least informative, of the measures listed above. Effort is arguably the most useful measure for evaluating tax equity, but linking incomes to taxes paid (especially within communities) requires granular tax data that are often unavailable. Even tax effort is not a perfect measure because ability to pay increases with wealth as well as with income (for those who can liquidate a portion of their wealth). Thus, any thorough analyses of tax equity must also include measures of tax price and effective tax rates.

## Tax Equity Examples

Figure 1 shows data from Wiehe et al. (2018) on state and local tax effort rates, by state and by income level. Each colored bar shows the tax effort corresponding to a particular income level, from the lowest (dark gray) to the highest (dark blue). The leftmost set of bars shows that New Hampshire has inequitable (or regressive) taxation, as measured by effort: Those who earn the most pay only 3% of their income in taxes, substantially less than the 9% paid by those who earn the least. This tax inequity is also observed, although to a lesser extent, in the United States as a whole (second set of bars) and in Kansas (middle set of bars).

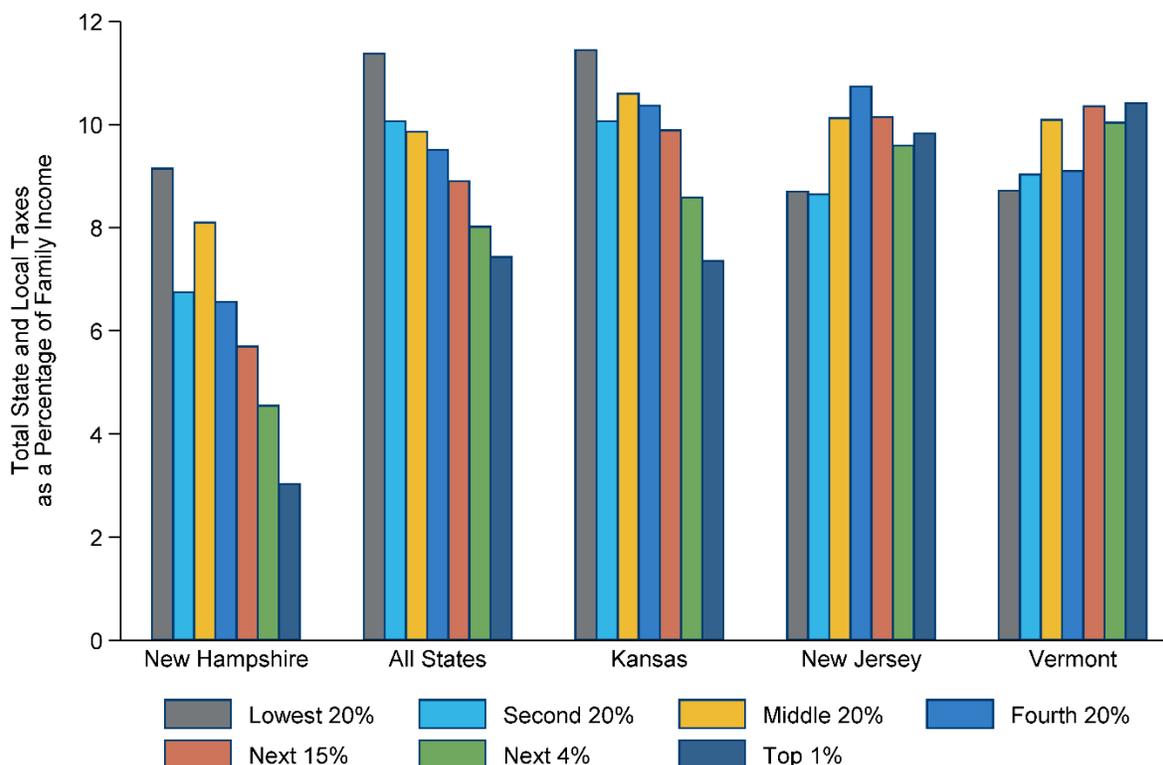
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<sup>2</sup> In areas in which home prices are increasing, local tax revenues will be higher if properties are assessed more frequently; conversely, if home prices are declining, local jurisdictions will raise more revenue if they assess property values less frequently.

<sup>3</sup> Davis (2019), for example, identifies 30 states and the District of Columbia that offer a property tax cap that limits property taxes for individuals with low income, including New Hampshire. In some states, the tax cap is limited to the elderly and/or disabled.

New Jersey and Vermont, in contrast, show flat or slightly progressive patterns of tax effort, with the top earners paying a slightly greater share of income than those near the bottom of the income distribution.

**Figure 1. Tax Effort by Income Level**

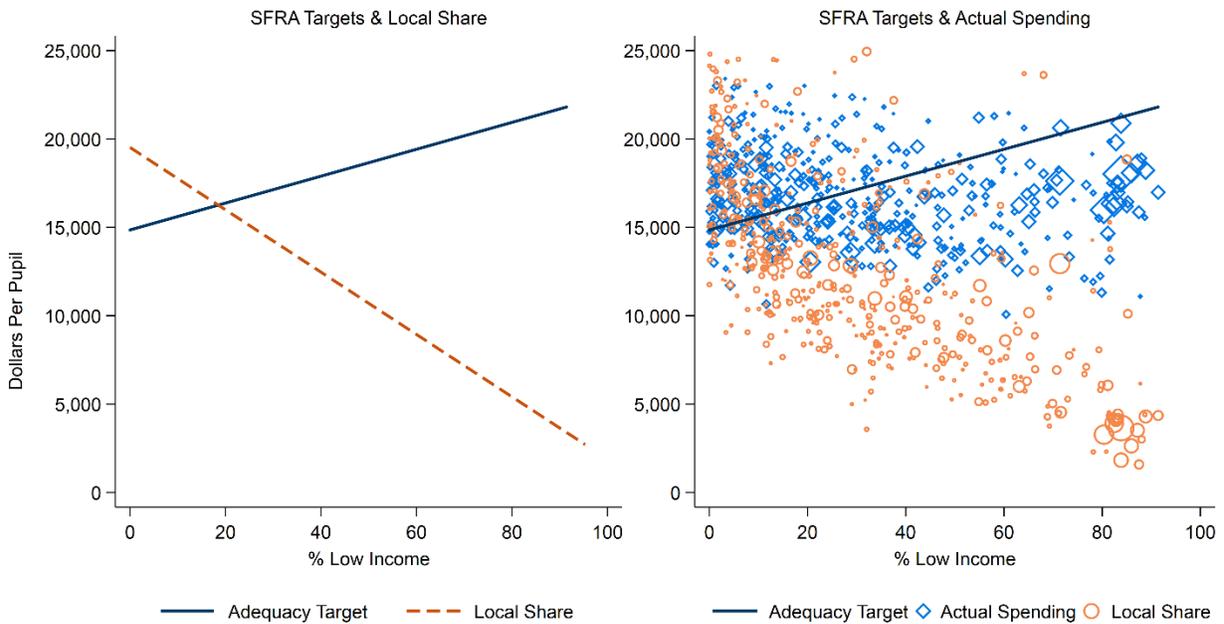


Note: Based on data from Wiehe et al., 2018.

Figure 2 provides greater detail on the design of New Jersey’s school aid formula. The basic design of the formula is on the left, while the reality of school funding is on the right. Higher poverty districts are estimated by the formula to have greater needs and higher target spending, as shown by the upward sloping solid line. These districts also tend to have less taxable income and property wealth than low-poverty districts and are thus expected to pay for a smaller share of their spending targets with local revenue (shown by the downward sloping dashed line).

The right-hand panel shows the “local fair share” (orange circles), the adequacy targets specified by the formula (solid line), and actual per-pupil spending levels (blue diamonds). On average, actual per-pupil spending remains relatively flat as poverty increases, meaning that spending falls short of adequacy targets in high-poverty districts. However, the local share of actual spending falls markedly as poverty increases, as intended by the funding formula. State aid per pupil (the difference between the blue diamonds and orange circles) is therefore much greater in higher poverty districts, even while falling short of adequacy targets.

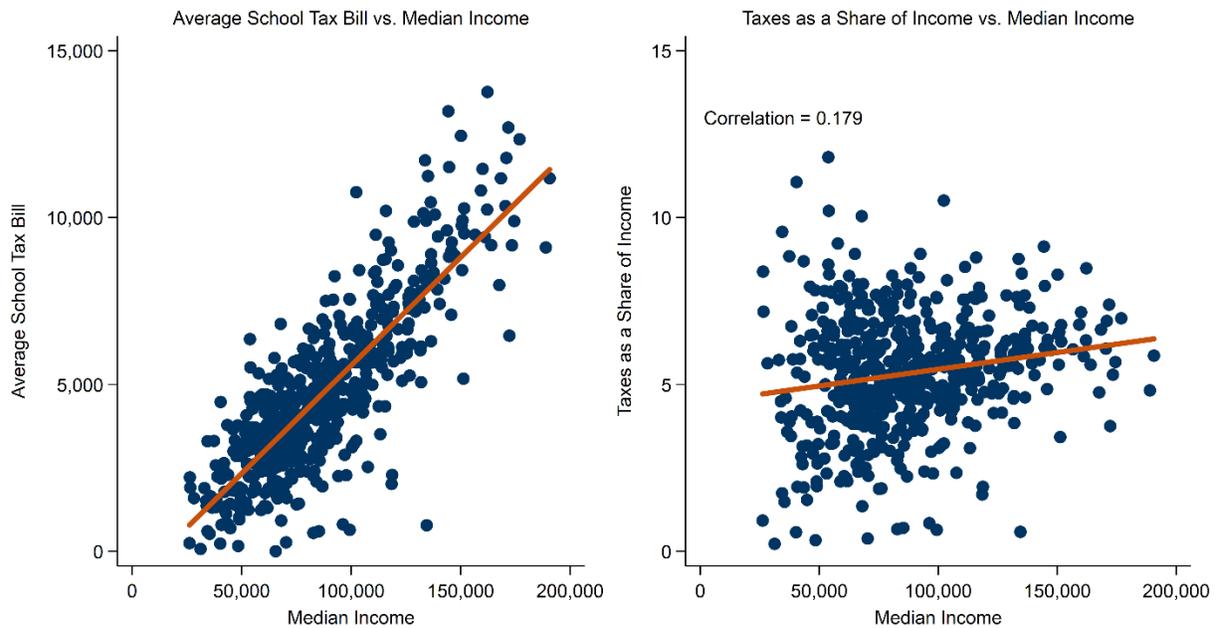
**Figure 2. New Jersey School Funding Reform Act (SFRA) Targets, Actual Spending, and the Local Share**



Notes: The adequacy target is the target level of funding set by the state using the funding formula specified by SFRA. The local share is the expected contribution per pupil from local revenue. Data are for the 2018–19 school year.

The left panel of Figure 3 shows the relationship between a district’s median income and its average school tax bill. Average property tax bills are substantially higher in higher income communities, as shown by the upward sloping best fit line (in orange). When looking at property tax bills as a share of median income, however, the relationship is much weaker (right panel). Overall, the distribution of tax effort in New Jersey is flat, or “neutral,” with respect to income, as shown earlier in Figure 1. Neutrality—the lack of a relationship between income or wealth and tax effort—can come either in the form of randomness or perfect equality (represented by districts falling on a horizontal line). In New Jersey, the pattern appears to be random; in fact, there is significant variation in tax effort across communities at the *same level* of median income, particularly at the lower end of the income scale. This variation reflects the fact that average housing values in New Jersey tend to vary substantially more across communities than median income.

**Figure 3. New Jersey School Average Taxes and Taxes as a Share of Income Versus Median Income**



Notes: Dark blue dots in the scatter represent each district in New Jersey during the 2016–17 school year. The orange line is the linear best fit.

## Linking Tax Equity and Funding Adequacy

Now that we have defined metrics for both tax equity and resource equity, we outline several approaches for addressing these two objectives. These three approaches are presented in increasing order of their ability to meet the dual goals of education funding.

### Level 1: Tax Equity Without Equal Opportunity or Adequacy

At Level 1, the *tax price* is equalized across districts. That is, each local district or municipality pays a comparable price (in units of “effort” rather than the nominal rate) to raise an additional dollar of cost-adjusted revenue per pupil for their local district.

This approach does not guarantee the provision of equal opportunity or the adequacy of funding. It merely guarantees that all communities have equal capacity to raise revenue after adjusting for differences in the cost of achieving common outcomes. That is, this approach equalizes the ability of districts to increase student outcomes through taxation effort without guaranteeing any specific level of actual revenues.

## Level 2: Tax Equity With Equal Opportunity

Level 2 achieves both equal educational opportunity and tax equity. Here, equal educational opportunity means that each district receives the funding required to meet a specified level of outcomes. However, this target outcome level is not necessarily tied to any definition of adequacy.

More specifically, Level 2 equity is achieved by equalizing both *tax effort* (not the nominal tax rate) and *cost-adjusted revenue per pupil* across districts. This ensures that all districts have both the same ability to raise revenue and the same ability to achieve at a certain outcome level. In practice, this requires mandating that all districts levy a uniform tax effort, which, when coupled with state aid, brings each district to an equal cost-adjusted level of spending.

## Level 3: Tax Equity With Adequacy and Equal Opportunity

At Level 3, a state provides for both taxpayer equity and equal opportunity to achieve *adequate* outcomes. In this scenario, each district has the same *tax effort* (not necessarily the same nominal tax rate) and the same *cost-adjusted revenue per pupil*, which is adequate for achieving desired outcomes. In practice, this means that all districts must raise exactly the amount of local revenue that will (a) bring them to the statewide level of required tax effort and (b) when coupled with state aid, bring them to an adequate level of funding. Districts with lower median income levels will need to raise less local revenue in order to meet the required tax effort level and consequently will receive more state aid in order to reach an adequate level of per-pupil funding.

## Tiered/Combined Approaches

In practice, a number of states, including Texas and Kansas, apply hybrid approaches. These involve a “first tier” formula that attempts to achieve cost-adjusted spending adequacy across districts at an equitable tax rate, and a “second tier” formula, which provides additional state aid such that districts that choose to raise additional revenue face a similar tax price. Typically, however, the second tier formula does not account fully (if at all) for how cost differences affect the value of each additional dollar raised.

This approach compromises equal opportunity by permitting districts to apply supplemental tax effort, which allows their children to achieve at higher levels than the adequacy target. However, all districts are *in theory* provided equal tax capacity to raise student outcomes. It remains important to recognize, though, that there will always exist a relative component of educational adequacy. If some districts provide a better education to the students they serve, the effective adequacy of outcomes for students in other districts is reduced, even if these students receive an education that meets some absolute adequacy criteria (such as minimum test score threshold) (Koski & Reich, 2006). Ultimately, all students compete with one another for college admissions and job opportunities, and facing higher achieving peers places students who “only” meet adequacy criteria at a relative disadvantage.

## Summary

Aligning equitable tax policy with equitable and adequate school funding is a complex process. Adopting a rational school finance policy framework is key to initiating this process, but the long run success of any school finance system requires ongoing monitoring of key equity indicators as well as regular recalibration of formula components to respond to changes in these indicators. Ongoing monitoring should include at least three types of evaluation:

1. Tracking of measures of tax effort across jurisdictions in relation to cost-adjusted revenues and spending
2. Tracking of measures of the equity and adequacy of cost-adjusted revenues and spending across jurisdictions
3. Statewide evaluation of taxpayer equity by income and by tax type

In ongoing recalibration of the formula, one important consideration is developing policy measures that encourage local districts to spend at their adequacy target levels. Policymakers may also consider recalibrating the factors used to set local contributions to funding targets, which may include, for example, measures of both taxable property wealth and income.

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