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# A 50-State Strategy to Achieve School Finance Adequacy

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This article estimates the costs of school finance adequacy in each of the 50 states and Washington, D.C. by applying the recommendations from an evidence-based model to the student characteristics of each individual state. Using two different prices, (a) the national average teacher salaries adjusted by a comparable wage index and (b) individual state teacher salaries, the authors estimate per pupil costs of adequacy. Results suggest that in 30 states additional resources are needed to reach the funding level for the evidence-based model. The findings do not make adjustments for diseconomies resulting from large numbers of small schools or districts or other state preferences for educational services that could lead to individual state variations from the authors' findings.

***Keywords:*** *adequacy; school finance; economics of education*

In recent years, the focus of school finance has been on estimating the costs of providing an adequate education for all students. Rebell (2007) stated that since 1989, 20 of 27 final state court rulings on school finance have held that current funding systems do not provide students with access to an adequate education. Combined with the influence of the federal No Child Left Behind legislation that has sharply focused state education policy on standards-based programs, the question of how much it costs to educate students to state performance standards has been at the forefront of educational policy discussions in all 50 states.

There are a number of approaches available to answer the question of what those costs might be. Researchers have provided a range of estimates for the cost of an adequate education in many of the 50 states. The findings from these studies vary widely across states, and in instances where multiple

studies have been conducted in individual states, the findings often differ.[1] The differences stem from both the alternative approaches used to estimate adequacy and variation in the assumptions underpinning the analyses themselves. Furthermore, some analysts are uncomfortable with the term *adequacy* itself and question any cost estimate.

To date, no one has tried to estimate the costs of adequacy across all 50 states using at least one common method applied in a consistent manner. This article attempts to resolve that gap in the literature by providing state-by-state estimates of the cost of the evidence-based approach as described by Odden and Picus (2008). The work is an outgrowth of previous research suggesting that on a national basis the cost of the evidence-based approach is approximately 9% higher than current spending for K-12 education (Odden, Goetz, & Picus, 2008). In that initial work, Odden et al. (2008) relied on national pupil counts and on national averages of the percentage of students with disabilities, the percentage of students eligible for free and reduced-price lunches, and the proportion of students in need of English as a second language programs to estimate a national average per pupil cost of the evidence-based model.

Odden et al. (2008) were careful to point out that although the overall costs are approximately 9% higher than current spending, it is likely today that some states spend more than the model would estimate whereas others spend less. Furthermore, these national estimates do not take into consideration diseconomies of small size or other district and school characteristics that policy makers may want to address when calculating the cost of adequacy (e.g., Odden et al., 2005). Adjustments for these diseconomies will generally lead to higher total costs, especially if the states exceeding the estimated level do not reduce spending and share those funds with low-spending states—an unlikely occurrence and one not likely to be mitigated even with a dramatically increased federal role in K-12 education revenues.

In the research reported here, we provide more accurate state-by-state estimates of the cost of the evidence-based model and compare those estimates to current spending in each of the states. This approach allows individual states to see how well their current funding systems compare with one measure of adequacy.

The balance of this article is divided into four sections. The first provides background on school finance adequacy and offers a description of the evidence-based approach. The second section describes our method for developing state-by-state estimates of the costs of the evidence-based model. The third section provides two alternative estimates for each state—one based on national average salaries adjusted by a comparable wage

index (CWI) and the second relying on actual average teacher salaries in each state. Finally, the fourth section contains our conclusions and makes recommendations for further research to estimate school finance adequacy.

## The Evidence-Based Approach to School Finance Adequacy

### Background

We define *adequacy* as providing a level of resources to schools that will enable them to make substantial improvements in student performance over the next 4 to 6 years as progress toward ensuring that all, or almost all, students meet their state's performance standards in the longer term. Substantial improvement in student performance means that where possible the proportion of students meeting a proficiency goal will increase substantially in the short to medium term. Although specific targets might vary depending on the state and a school's current performance, this goal could be interpreted as raising the percentage of students who meet a state's student proficiency level from 35% to 70% or from 70% to something approaching 90% and in both examples to increase the percentage of students meeting advanced proficiency standards.

The question then becomes how to estimate a level of resources that will provide the capacity for schools to make these substantial improvements in student performance. A number of approaches to estimating adequacy are available in the literature. They include cost functions (e.g., Duncombe, Ruggiero, & Yinger, 1996; Imazeki & Reschovsky, 2005; Reschovsky & Imazeki, 1998, 2000, 2001), professional judgment (e.g., Augenblick, Myers, Silverstein, & Barkis, 2002; Guthrie et al., 1997), successful schools and districts (e.g., Augenblick, 2001; Augenblick et al., 2002; Dupree, Augenblick, & Silverstein, 2006; Fermanich et al., 2006), and evidence based (Odden & Picus, 2008). No approach is perfect, and many analysts question whether estimating the costs of adequacy can be done with current knowledge and technologies. Nevertheless, the approaches described above have been developed and used in a wide range of circumstances. Downes and Stiefel (2008) offered a summary and comparison of these methods.

Our focus in this work is on the evidence-based method.[2] The essence of the evidence-based approach is to give primary influence for making programmatic recommendations to research evidence. In distilling the research evidence, our strongest programmatic recommendations are those supported

by randomized trials and/or meta-analyses of effects. These include recommendations for class sizes of 15 in Grades K-3 as well as recommendations for tutoring and summer school. Other recommendations are based on best practices and are often derived from the resource parameters of comprehensive school reforms. These include recommendations such as class sizes of 25 in Grades 4-12 (e.g., Stringfield, Ross, & Smith, 1996). Finally, in some cases where there is little or no experimental research—for example, on the use of guidance counselors and nurses—our approach relies on other peer-reviewed research and/or recommendations from professional associations. At this stage of development, the evidence-based approach relies on evidence for each individual recommendation and provides "effect sizes" from the research on the individual programs. The effect sizes can be used by state policy makers to prioritize program decisions in a world of scarce resources.

In most places where we have worked, the natural question is what the impact would be if a district or school put all the individual recommendations into action. We have said that there is little if any good quantitative research to answer that question and that it would be improper to add the individual effect sizes to provide an estimate of the overall impact. Our approach to answering this question has been to study districts and schools that have made substantial gains in student performance, to identify the strategies they use, and to compare those strategies to the core recommendations in the evidence-based model (e.g., Odden et al., 2007). We have found a strong alignment between the strategies and the resources in our core evidence-based model and those strategies used by districts and schools that have seen student learning increase dramatically. Based on these findings, we argue that the resources in the model are a good first approximation of what it would take for districts and schools to make large gains in student performance over a 4- to 6-year time frame. Gains such as those would constitute significant progress toward the more ambitious goal of educating all, or nearly all, students to rigorous national proficiency standards.

In the states where we have used the evidence-based approach, the process starts with a set of core recommendations based on our distillation of research and best practices (see chapter 4 in Odden & Picus, 2008). However, as the process unfolds, teams of state policy makers as well as education leaders and practitioners review, modify, and tailor our core recommendations to the context of each state's situation. In this article, our state-by-state estimates are derived using the core recommendations of the evidence-based model (Odden & Picus, 2008).[3]

Although there are some limitations to reliance on existing research, we are confident that when combined with other evidence, particularly that from the more general school improvement literature, the findings provide an excellent starting point for estimating the resources that can work in schools in the short to medium term to boost student achievement. In other words, if funds are used efficiently and effectively, they are likely to be sufficient for districts and schools to dramatically increase student performance.

We have sought to distill the evidence into cohesive school strategies. As we show below, when we estimate the costs of all practices together, we find that, under reasonable assumptions, the full range of what the best educators claim is needed to improve student performance can be provided in many states without spending substantially more per pupil—and in some states with fewer dollars than are currently in the system.

## Parameters of the Evidence-Based Model

The evidence-based model includes the following recommendations (for supporting evidence, see Odden & Picus, 2008):[4]

1. Full-day kindergarten.
2. Core class sizes of 15 for Grades K-3 and class sizes of 25 for Grades 4-12. Core is defined as the regular classroom teacher in elementary school and teachers of mathematics, science, reading, English or writing, history, and world language in secondary schools. With these ratios, class sizes average about 18 in the elementary school and 25 in middle and high schools.
3. Specialist teachers to provide instruction in art, music, physical education, career technical education, and other electives and in numbers adequate to cover a six-period day in middle schools with teachers teaching for just five periods and 90-minute block schedules in high schools. This resource also provides all teachers with time during the day for collaborative planning and to work on the instructional program. The formula provides specialist teachers at the rate of 20% of core teachers for elementary and middle schools and 33% of core teachers for high schools.
4. At least one period (usually an hour) of planning and preparation time each day for all teachers in elementary, middle, and high schools.
5. Pupil support staff including guidance counselors (1 full-time equivalent [FTE] position for every 250 students in middle and high schools) and nurses as well as additional pupil support to include social workers and family liaison personnel, the latter provided on the basis of 1 FTE position for every 100 at-risk students.[5]

6. A full-time librarian and principal in every prototypical school as well as two secretarial positions in the prototypical elementary (432 students) and middle school (450 students) and three secretaries in the prototypical high school (600 students).
7. An ambitious set of professional development resources including one instructional coach for every 200 students (e.g., 3.0 FTE positions in a 600 student high school), at least 10 pupil-free days for professional development, which usually means extending the school year for teachers by 5 additional days, and $100 per pupil for trainers and other expenses related to professional development.
8. Supervisory aides to cover recess, lunch, hall monitoring, and bus loading and unloading.
9. Funds for instructional materials, formative assessments, and supplies ($165 per pupil for elementary and middle schools and $200 per pupil for high schools); $250 per pupil for technology and equipment; and $250 per pupil for student activities (sports, clubs, etc.).
10. Funding of $25 per pupil to provide extra strategies for gifted and talented students.
11. A comprehensive range of "extra help" strategies for students who need additional instructional assistance and extra time to achieve to rigorous state proficiency standards, including,

    a. Resources to provide one-to-one tutoring at the ratio of 1 FTE teacher tutor position for every 100 at-risk students.
    b. Extended-day resources to provide academic help for 2 hours of before or after school programming, at the ratio of 1 FTE position for every 30 at-risk students, assuming about 50% of at-risk students would participate.
    c. Summer school resources to provide up to a 6-hour day and 8-week summer program and academic help for two thirds of the time, at the ratio of one FTE position for every 30 at-risk students, assuming 50% of at-risk students would need such extra help and would attend the program.
    d. One additional FTE teacher position for every 100 English language learner (ELL) students (the bulk of whom also are at risk and trigger the first three extra help resources), primarily to provide instruction in English as a second language.
    e. One teacher FTE and 0.5 aide position for every 150 students to provide services for high-incidence but lower cost students with disabilities (3 teacher and 1.5 aide positions at the prototypical elementary and middle schools and 4 teacher and 2 aide positions at the prototypical high schools). The model also advocates full state funding of the entire costs of the high-cost special need students (assuming 2% of those with disabilities are in the "high-cost" category).

12. Substitute teacher resources at 10 days for each teacher and instructional facilitator position.
13. Central office staff covering the superintendent's office, the business office, curriculum and pupil support, technology personnel, and an operations and maintenance director configured on a prototypical district (see Odden et al., 2007).

To show what these core recommendations mean in terms of staff positions and dollars, the recommendations are often displayed as applied to prototypical elementary, middle, and high schools (see Table 1). However, in actual use in Wyoming, for example, the core recommendations are "fit" to the student numbers and student demographics of each school in a state. As a result, schools with more students than shown in the prototypical models would have proportionately more resources and schools with fewer students would receive fewer resources, though several core resources—principal, secretary, librarian—often are retained for smaller schools to address diseconomies of small school size. Furthermore, schools with larger concentrations and numbers of at-risk students would be eligible for a greater level of resources targeted to meet their needs and triggered by those higher pupil counts.

As described in the sections below, we use this model to estimate the costs of an adequate education program in each of the 50 states. The next section describes our method in detail, followed by a section outlining our findings for each of the 50 states.

## Method

In 49 of the 50 states, funding for schools is distributed at the district level.[6] Consequently, school finance formulas have traditionally focused on school districts, and many school finance adequacy studies also use the school district as the unit of analysis. The evidence-based approach allows cost estimates and school finance formulas to be school based. When an evidence-based adequacy study is conducted in an individual state, we tailor the recommendations for prototypical elementary, middle, and high schools by applying the formulas in Table 1 and for central resources to the actual student enrollment and demographics in each district in the state. Generally, we prorate all resources upward (for enrollments larger than the prototype). For schools with enrollments lower than the prototypes we prorate most resources down to a level of approximately 96 to 100 students.

**Table 1**
**Recommendations for Adequate Resources for Prototypical Elementary, Middle, and High Schools**

| School Element | Elementary Schools ($) | Middle Schools ($) | High Schools ($) |
|---|---|---|---|
| School characteristics | | | |
| School configuration | K-5 | 6-8 | 9-12 |
| Prototypical school size | 432 | 450 | 600 |
| Class size | K-3: 15, 4-5: 25 | 6-8: 25 | 9-12: 25 |
| Full-day kindergarten | Yes | N/A | N/A |
| Number of teacher work days | 190 teacher work days, an increase of 5 days | 190 teacher work days, an increase of 5 days | 190 teacher work days, an increase of 5 days |
| Percentage of students with disabilities | 13.7 | 13.7 | 13.7 |
| Percentage poverty (free and reduced-price lunch) | 36.3 | 36.3 | 36.3 |
| Percentage ELLs | 10.6 | 10.6 | 10.6 |
| Personnel resources | | | |
| 1. Core teachers | 24 | 18 | 24 |
| 2. Specialist teachers | 20% more: 4.8 | 20% more assuming a six-period day with each FTE teaching 5 periods: 3.6 | 33% more assuming a 90-min block schedule with each FTE teaching 3 blocks a day: 8.0 |
| 3. Instructional facilitators or coaches (ratio of 1 for every 200 students) | 2.2 | 2.25 | 3.0 |
| 4. Tutors for struggling students | 1 for every 100 poverty students: 1.57 | 1 for every 100 poverty students: 1.63 | 1 for every 100 poverty students: 2.18 |
| 5. Teachers for ELL students | An additional 1.0 teachers for every 100 ELL students: 0.46 | An additional 1.0 teachers for every 100 ELL students: 0.48 | An additional 1.0 teachers for every 100 ELL students: 0.64 |
| 6. Extended day | 1.31 | 1.36 | 1.74 |
| 7. Summer school | 1.31 | 1.36 | 1.74 |

*(continued)*

**Table 1 (continued)**

| School Element | Elementary Schools ($) | Middle Schools ($) | High Schools ($) |
|---|---|---|---|
| 8. Students with mild disabilities | Additional 1 professional teacher positions per 150 students and 0.5 aides for each special education teacher | Additional 1 professional teacher positions per 150 students and 0.5 aides for each special education teacher | Additional 1 professional teacher positions per 150 students and 0.5 aides for each special education teacher |
| 9. Students with severe disabilities | 100% state reimbursement minus federal funds | 100% state reimbursement minus federal funds | 100% state reimbursement minus federal funds |
| 10. Resources for gifted or talented students | $25/student | $25/student | $25/student |
| 11. Substitutes | 10 days per FTE | 10 days per FTE | 10 days per FTE |
| 12. Pupil support staff | 1 for every 100 poverty students: 1.32 | 1 for every 100 poverty students plus 1.0 guidance per 250 students, 3.18 total | 1 for every 100 poverty students plus 1.0 guidance per 250 students, 4.25 total |
| 13. Supervisory aides | 2.0 | 2.0 | 3.0 |
| 14. Librarians or media specialists | 1.0 | 1.0 | 1.0 |
| 15. Principal | 1 | 1 | 1 |
| 16. School site secretary | 1.0 secretary and 1.0 clerical | 1.0 secretary and 1.0 clerical | 1.0 secretary and 1.0 clerical |
| Dollar per pupil resources | | | |
| 17. Professional development (PD) | Included above: instructional facilitators, 10 summer days; Additional: $100/pupil for other PD expenses—trainers, conferences, travel, etc. | Included above: instructional facilitators, 10 summer days; Additional: $100/pupil for other PD expenses—trainers, conferences, travel, etc. | Included above: instructional facilitators, 10 summer days; Additional: $100/pupil for other PD expenses—trainers, conferences, travel, etc. |
| 18. Technology and equipment | $250/pupil | $250/pupil | $250/pupil |

*(continued)*

**Table 1 (continued)**

| School Element | Elementary Schools ($) | Middle Schools ($) | High Schools ($) |
|---|---|---|---|
| 19. Instructional materials, including textbooks, formative assessments | $165/pupil | $165/pupil | $200/pupil |
| 20. Student activities | $250/pupil | $250/pupil | $250/pupil |
| Other expenditures[a] | | | |
| 22. Operations and maintenance | $940 per pupil | $940 per pupil | $940 per pupil |
| 23. Transportation | $390 per pupil | $390 per pupil | $390 per pupil |
| 24. Food services | $340 per pupil | $340 per pupil | $340 per pupil |

Note: ELL = English language learner; FTE = full-time equivalent.
a. Note that "other expenditures" are carried forward in this model; actual state expenditures for operations and maintenance, transportation, and food are used. National averages for these and all other elements are listed in Table 1. In typical studies by Lawrence O. Picus and Associates, the cost of food services is assumed to be a self-supporting enterprise activity; where such services operate at a loss, the model recommends outsourcing the function to a private sector company whose core business is food services, such as ARA Services. In this model, in an attempt to ease comparisons between actual expenditures and the costs associated with the evidence-based model, these expenditures are carried forward.

The exceptions to this are that until enrollment falls below about 96, we maintain one full-time principal and a full-time librarian. Below enrollments of 96 to 100, we work with state education officials and policy makers to design appropriate prototypical schools that meet the unique circumstances of schools that size in each state.

The resources identified for each school in a school district are aggregated and then added to the resources generated for district-level operations based on the district's enrollment, providing an estimate of the level of resources needed for adequate funding in each district. These district totals are summed to determine the total cost to the state—a cost that can be shared among a combination of state and local resources based on the historical patterns, constitutional and legal requirements, and policy framework of each individual state. Funds would then be distributed to school districts as is currently done in all states except Hawaii, which has a state-operated school system.

The flexibility a district retains in distributing staff and funds to school sites then becomes a state policy issue, as is the division of responsibility

between school districts and the state to raise the revenues required to fund the system.[7] By summing the cost of the resource needs of the districts in a given state, the total cost of adequacy can be estimated and compared to current spending. Wyoming is currently using the evidence-based model in this school-based manner.

A second approach to using the evidence-based model is to estimate an average state cost by applying the recommendations to prototypical schools in a prototypical district with the statewide average demographics. In our work in various states, this produces a figure very close to the school-based approach discussed above. An example of how this would work is Arkansas, which used the evidence-based recommendations to adjust its foundation program.

As is traditional in school finance, to facilitate comparisons across states, we report cost estimates and current expenditures on a per-pupil basis.[8] In addition, all cost estimates were inflated or deflated to reflect price levels for the 2005-2006 school year.

## School Costs

For the analysis presented in this article, the cost estimates are developed using a prototypical school district with 3,828 students, with 288 students in each grade, K-5 and 300 students in each grade, 6-12. This results in a district with eight schools—four elementary schools (K-5) of 432 students each, two middle schools (6-8) of 450 students each, and two high schools (9-12) of 600 students each. Though many of the staffing resources are estimated on the basis of pupil counts, some of the resources identified in Table 1 flow to schools on the basis of students with special needs or who are "at risk." Consequently, counts of students with disabilities, students who quality for free and reduced-price lunch, and students who are eligible for ELL services are also used—specifically the averages of these counts for each individual state in the 2005-2006 school year—as is student enrollment. Grade-level pupil counts as well as counts of special education, free and reduced-price lunch eligible, and ELL-served students were extracted from the National Center for Education Statistics (NCES) common core of data (CCD) (NCES, 2007).[9]

These pupil counts (by grade level and measure of student need) were then used to generate the appropriate demographic figures for each of the prototype schools in the prototypical district for each state. Staff and dollar resources were estimated for each of the prototype schools in each state to calculate staffing and expenditure requirements based on the

evidence-based approach to adequacy. The cost of each resource was estimated as described below, and the total cost for each prototype school and district was determined. When summed by state, estimates of the cost of adequacy were derived.

It should be noted that the state-based recommendations generated through this process do not adjust for diseconomies of school or district size within states. Although adjustments for these diseconomies of scale can be substantial in some states, we do not make adjustments here because of the considerable differences in approaches used to accommodate the higher costs of small schools across the states. These differences are also why the cost estimates may be quite different than estimates produced in each state during a formal adequacy study, in which these adjustments are likely to be made, as well as other adjustments requested by policy makers.

## Central Office or District Costs

Although the model is school based, districts play an important role in the operation and administration of public schools. Based on our previous work in Wyoming, Washington, and Wisconsin, we have developed a staffing model for school district central offices for a school district of approximately 3,500 students (see Odden et al., 2005; Odden et al., 2007; Odden, Picus, Goetz, Mangan, & Fermanich, 2006). The staffing requirements for the central office are displayed in Table 2. Using national average salaries for the positions identified, we estimate the costs of a central office to be $378 per pupil for staff resources as well as an additional $300 per pupil for contracts, supplies, materials, travel, and other expenses. As described below, the personnel component costs for the central office were adjusted for regional cost differences, whereas the remaining $300 per pupil was used in each state.

The costs of maintenance and operations, transportation, and food services are more difficult to estimate; moreover, defining a level of adequacy is hard to do given the lack of state-level data available to produce models for these costs. Consequently, for our cost estimates, we "carried forward" these expenditures. That is, we used each state's expenditures in these categories for 2003-2004 and inflated them to 2005-2006 levels using the Consumer Price Index—an increase of approximately 6.7%.

## High-Cost Special Education Programs

The evidence-based model provides resources at each prototypical school to provide special education services for students with mild and

**Table 2**
**Composition of a Central District Office for a District With 3,500 Students**

| |
|---|
| Superintendent's office |
| 1 superintendent |
| 1 assistant superintendent |
| 2 secretaries |
| Curriculum and support office |
| 1 director of pupil services |
| 1 director of special education |
| 1 psychologist |
| 3 secretaries |
| Business office |
| 1 business manager |
| 1 human resources manager |
| 1 secretary |
| 1 payroll clerk |
| 1 accounts payable clerk |
| Technology office |
| 1 director of technology |
| Operations and maintenance office |
| 1 director of maintenance and operations |
| 1 secretary |

moderate disabilities via the census approach to funding these students' needs (Odden & Picus, 2008). The model recommends that low-incidence, high-cost special education services be funded directly by the state. Based on work in Wisconsin (Odden et al., 2007), we found that these high-cost special education students cost districts an average of $42,146 above the costs of a regular special education student. These students represent approximately 2% of the special education population. Consequently, in our cost estimates, we fund low-incidence, high-cost special education students at a rate of $42,146, multiplied by 2% of each state's special education population. This cost is adjusted by the CWI as described below.

Cullen (2003) suggested that if states provide full funding for certain categories of students with disabilities, it will create an incentive for districts to overidentify students in those areas. Although we recognize this risk, observations in Wyoming—which fully funds all special education costs—show special education identification rates in line with those in other states. Moreover, because funding would be available for programs for children with the most severe disabilities, it would be possible for states to monitor individualized education plans more closely to control costs.

## Salaries

Not unexpectedly, the bulk of resources identified through the evidence-based model is for staff—teachers, administrators, clerical staff, site administrators, and central office personnel. Once the numbers of staff in each state were computed, we estimated the cost (salaries and benefits) for those staff. We estimated this cost using two different methodologies. In the first, we used national average compensation as estimated by the Educational Research Service (2006) for all positions, adjusted for each state by the CWI to account for different labor costs across states. In the second model, we used state average compensation for all teacher-salaried positions and the national average compensation adjusted by the CWI for all other positions. The source of the average teacher salaries by state is the National Education Association (2007).

The evidence-based model includes additional resources to provide teachers, librarians, counselors, nurses, and instructional coaches with 10 days of professional development time. We assumed that the average teacher contract already calls for 5 such days and thus estimated the cost of providing an additional 5 professional development days for those categories of staff. Table 3 displays the national average salaries and benefits as well as the cost of additional professional development used in our first model. Table 4 shows the state average teacher salaries and total compensation used in our second model.

Before estimating costs by state, we adjusted national compensation data by a CWI to accommodate variations in the cost of living in regions throughout the United States. The specific index used was developed by Taylor and Fowler (2006), and it uses data on labor costs for positions outside of K-12 education system to determine the relative cost of employing individuals across regions, with the assumption that all workers, including education staff, will vary their required pay based on the amenities and disamenities of a regional labor market. The regional variation of labor costs is rolled up to the state level, and these indexes are applied to each state and Washington, D.C. In 2005-2006, these indexes ranged from 0.74 in Montana to 1.23 in Washington, D.C.

Debt service and capital outlay costs are not included in any of our estimates of "operating expenditures." Our final cost estimates are presented in the next section.

# Findings

Table 5 shows our state-by-state estimates of the costs of the evidence-based model using national average compensation, and Table 6 provides

**Table 3**
**Salary and Benefit Rates (2005-2006)**

| Position | Salary ($) | Model Benefits ($) | Additional 5 Days PD ($) | Total Compensation ($) |
|---|---|---|---|---|
| School Building | | | | |
| Principal | 80,411 | 20,986 | 0 | 101,397 |
| Asst. principal | 67,836 | 18,956 | 0 | 86,792 |
| Teacher | 46,953 | 15,583 | 0 | 62,536 |
| Librarian | 52,505 | 16,480 | 0 | 68,985 |
| Media Tech | 37,562 | 14,066 | 0 | 51,629 |
| Counselors | 51,862 | 16,376 | 0 | 68,238 |
| Other Prof Staff | 54,071 | 16,732 | 0 | 70,803 |
| School Secretary | 24,887 | 12,019 | 0 | 36,906 |
| Nurse | 39,651 | 14,404 | 0 | 54,055 |
| School Clerical | 19,910 | 11,215 | 0 | 31,125 |
| Supervisory Aide | 15,915 | 10,570 | 0 | 26,485 |
| Custodian | 18,176 | 10,935 | 0 | 29,112 |
| Central Office | | | | |
| Superintendent | 116,244 | 26,773 | 0 | 143,017 |
| Asst. Superintendent | 99,771 | 24,113 | 0 | 123,884 |
| Business Manager | 78,154 | 20,622 | 0 | 98,776 |
| Instructional Services | 83,279 | 21,450 | 0 | 104,729 |
| Staff-personnel Services | 80,568 | 21,012 | 0 | 101,580 |
| Technology | 66,832 | 18,793 | 0 | 85,625 |
| Other Areas | 68,229 | 19,019 | 0 | 87,248 |
| Secretary | 33,077 | 13,342 | 0 | 46,419 |
| Accounting/payroll clerks | 34,829 | 13,625 | 0 | 48,454 |
| Typists/data-entry clerks | 26,156 | 12,224 | 0 | 38,380 |
| Substitutes | 100 | 8 | 108/day | |

Source: Salary information from Education Research Service, National Survey of Salaries and Wages in Public Schools, 2005-2006. Principal salaries are based on an unweighted average of elementary, junior high or middle, and high school principal salaries. Media technician salary is 80% of teacher salary, and school clerical salary is 80% of secretary salary. Supervisory aide salary is based on 7.5 work hours for 185 school days. Benefits are 7.65% FICA/social security, 1.0% unemployment compensation, $8,000 health, and 7.5% retirement. Salaries for teachers, librarians, counselors, and nurses include an additional 5 days for professional development.

our estimates using state-by-state estimates of average teacher compensation and national averages for all other positions.

Table 5 shows the weighted per pupil estimated costs of the evidence-based model to be $9,641, an average increase of $566 per student on a national basis. Closer inspection shows that in 30 of the 50 states, additional revenues are needed to reach the estimated cost level as defined

**Table 4**
**Actual Teacher Salaries Plus 5 Days Professional Development**

| State | Avg. NEA Salary (05-06) ($) | Model Benefits ($) | Additional 5 Days PD ($) | Total Compensation ($) |
|---|---|---|---|---|
| Alabama | 40,347 | 14,516 | 1,267 | 56,130 |
| Alaska | 53,553 | 16,649 | 1,681 | 71,883 |
| Arizona | 44,672 | 15,215 | 1,402 | 61,289 |
| Arkansas | 42,768 | 14,907 | 1,343 | 59,018 |
| California | 59,825 | 17,662 | 1,878 | 79,365 |
| Colorado | 44,439 | 15,177 | 1,395 | 61,011 |
| Connecticut | 59,304 | 17,578 | 1,862 | 78,743 |
| Delaware | 54,264 | 16,764 | 1,703 | 72,731 |
| District of Columbia | 59,000 | 17,529 | 1,852 | 78,381 |
| Florida | 43,302 | 14,993 | 1,359 | 59,655 |
| Georgia | 48,300 | 15,800 | 1,516 | 65,617 |
| Hawaii | 49,292 | 15,961 | 1,547 | 66,800 |
| Idaho | 41,150 | 14,646 | 1,292 | 57,088 |
| Illinois | 58,686 | 17,478 | 1,842 | 78,006 |
| Indiana | 47,255 | 15,632 | 1,483 | 64,370 |
| Iowa | 41,083 | 14,635 | 1,290 | 57,008 |
| Kansas | 41,467 | 14,697 | 1,302 | 57,466 |
| Kentucky | 42,592 | 14,879 | 1,337 | 58,808 |
| Louisiana | 40,029 | 14,465 | 1,257 | 55,750 |
| Maine | 40,737 | 14,579 | 1,279 | 56,595 |
| Maryland | 54,333 | 16,775 | 1,706 | 72,813 |
| Massachusetts | 56,369 | 17,104 | 1,770 | 75,242 |
| Michigan | 54,739 | 16,840 | 1,718 | 73,298 |
| Minnesota | 48,489 | 15,831 | 1,522 | 65,842 |
| Mississippi | 40,576 | 14,553 | 1,274 | 56,403 |
| Missouri | 40,462 | 14,535 | 1,270 | 56,267 |
| Montana | 39,832 | 14,433 | 1,250 | 55,515 |
| Nebraska | 40,382 | 14,522 | 1,268 | 56,171 |
| Nevada | 44,426 | 15,175 | 1,395 | 60,995 |
| New Hampshire | 45,263 | 15,310 | 1,421 | 61,994 |
| New Jersey | 58,156 | 17,392 | 1,826 | 77,374 |
| New Mexico | 41,637 | 14,724 | 1,307 | 57,668 |
| New York | 57,354 | 17,263 | 1,800 | 76,417 |
| North Carolina | 43,922 | 15,093 | 1,379 | 60,394 |
| North Dakota | 37,764 | 14,099 | 1,185 | 53,048 |
| Ohio | 50,314 | 16,126 | 1,579 | 68,019 |
| Oklahoma | 38,772 | 14,262 | 1,217 | 54,251 |
| Oregon | 50,044 | 16,082 | 1,571 | 67,697 |
| Pennsylvania | 54,027 | 16,725 | 1,696 | 72,448 |
| Rhode Island | 54,730 | 16,839 | 1,718 | 73,287 |
| South Carolina | 43,011 | 14,946 | 1,350 | 59,307 |

*(continued)*

**Table 4 (continued)**

| State | Avg. NEA Salary (05-06) ($) | Model Benefits ($) | Additional 5 Days PD ($) | Total Compensation ($) |
|---|---|---|---|---|
| South Dakota | 34,709 | 13,606 | 1,090 | 49,404 |
| Tennessee | 42,537 | 14,870 | 1,335 | 58,742 |
| Texas | 41,744 | 14,742 | 1,310 | 57,796 |
| Utah | 40,007 | 14,461 | 1,256 | 55,724 |
| Vermont | 46,622 | 15,529 | 1,464 | 63,615 |
| Virginia | 43,823 | 15,077 | 1,376 | 60,276 |
| Washington | 46,326 | 15,482 | 1,454 | 63,262 |
| West Virginia | 38,284 | 14,183 | 1,202 | 53,669 |
| Wisconsin | 46,390 | 15,492 | 1,456 | 63,338 |
| Wyoming | 43,255 | 14,986 | 1,358 | 59,599 |

Source: National Education Association (2007).

**Table 5**
**Difference Using National Average Salaries**

| | K-12 | 05-06 Adequacy Cost | 05-06 Expenditures | Additional Cost |
|---|---|---|---|---|
| State | Enrollment | Per-Pupil ($) | Per-Pupil ($) | Per-Pupil ($) |
| Alabama | 737,270 | 8,882 | 7,706 | 1,176 |
| Alaska | 131,374 | 9,718 | 10,171 | (453) |
| Arizona | 1,084,281 | 8,964 | 5,585 | 3,379 |
| Arkansas | 463,088 | 8,403 | 8,402 | 1 |
| California | 6,259,972 | 10,451 | 8,486 | 1,965 |
| Colorado | 756,615 | 8,961 | 8,861 | 100 |
| Connecticut | 562,285 | 10,483 | 12,436 | (1,953) |
| Delaware | 120,257 | 10,322 | 12,036 | (1,714) |
| District of Columbia | 65,456 | 13,591 | 15,508 | (1,917) |
| Florida | 2,627,784 | 9,175 | 7,762 | 1,413 |
| Georgia | 1,559,828 | 9,578 | 8,534 | 1,044 |
| Hawaii | 181,225 | 9,039 | 9,879 | (840) |
| Idaho | 259,198 | 7,855 | 7,042 | 813 |
| Illinois | 2,039,114 | 9,964 | 9,456 | 508 |
| Indiana | 1,024,573 | 9,064 | 8,935 | 129 |
| Iowa | 476,656 | 8,181 | 7,807 | 374 |
| Kansas | 450,067 | 8,519 | 8,373 | 146 |
| Kentucky | 636,647 | 8,946 | 8,300 | 646 |
| Louisiana | 631,198 | 9,194 | 8,519 | 675 |
| Maine | 193,604 | 8,542 | 11,285 | (2,743) |
| Maryland | 835,801 | 10,115 | 9,771 | 344 |

*(continued)*

**Table 5 (continued)**

| State | K-12 Enrollment | 05-06 Adequacy Cost Per-Pupil ($) | 05-06 Expenditures Per-Pupil ($) | Additional Cost Per-Pupil ($) |
|---|---|---|---|---|
| Massachusetts | 947,292 | 10,370 | 12,596 | (2,226) |
| Michigan | 1,679,337 | 9,579 | 9,880 | (301) |
| Minnesota | 827,346 | 9,185 | 9,675 | (490) |
| Mississippi | 480,687 | 8,808 | 7,215 | 1,593 |
| Missouri | 899,857 | 8,909 | 7,840 | 1,069 |
| Montana | 144,339 | 7,623 | 8,361 | (738) |
| Nebraska | 280,183 | 8,265 | 7,900 | 365 |
| Nevada | 408,574 | 9,310 | 6,755 | 2,555 |
| New Hampshire | 202,630 | 8,561 | 10,206 | (1,645) |
| New Jersey | 1,307,390 | 11,397 | 13,781 | (2,384) |
| New Mexico | 320,688 | 9,172 | 8,622 | 550 |
| New York | 2,668,050 | 11,351 | 13,551 | (2,200) |
| North Carolina | 1,406,589 | 8,998 | 7,675 | 1,323 |
| North Dakota | 97,231 | 7,834 | 7,807 | 27 |
| Ohio | 1,809,892 | 9,246 | 10,034 | (788) |
| Oklahoma | 597,519 | 8,702 | 6,944 | 1,758 |
| Oregon | 550,028 | 8,875 | 8,649 | 226 |
| Pennsylvania | 1,817,450 | 9,434 | 10,711 | (1,277) |
| Rhode Island | 151,734 | 9,756 | 11,089 | (1,333) |
| South Carolina | 679,940 | 8,977 | 8,377 | 600 |
| South Dakota | 120,795 | 7,601 | 7,911 | (310) |
| Tennessee | 929,381 | 8,950 | 6,979 | 1,971 |
| Texas | 4,317,427 | 9,782 | 7,547 | 2,235 |
| Utah | 504,497 | 8,340 | 5,347 | 2,993 |
| Vermont | 92,457 | 8,287 | 12,475 | (4,188) |
| Virginia | 1,194,594 | 10,141 | 9,275 | 866 |
| Washington | 1,019,250 | 9,604 | 7,958 | 1,646 |
| West Virginia | 271,723 | 9,279 | 9,886 | (607) |
| Wisconsin | 843,956 | 9,133 | 9,965 | (832) |
| Wyoming | 83,970 | 8,327 | 11,596 | (3,269) |
| | 47,751,099 | 9,641 | 9,075 | 566 |

through the evidence-based model, but that in the remaining 20 states and Washington, D.C., current funding levels are more then enough to fund the resources identified through the evidence-based model. If all states were to receive funding at the estimated level of the evidence-based model, the total cost would be $27.0 billion, or a 6.2% increase. However, if we do not use the "excess funds" from the states currently spending more than that level, which is the politically feasible approach, the cost rises to $47.2 billion (10.9% increase) to fully fund the model's estimates.

**Table 6**
**Difference Using Actual Teacher Salaries**

| State | K-12 Enrollment | 05-06 Adequacy Cost Per-Pupil ($) | 05-06 Expenditures Per-Pupil ($) | Additional Cost Per-Pupil ($) |
|---|---|---|---|---|
| Alabama | 737,270 | 8,863 | 7,706 | 1,157 |
| Alaska | 131,374 | 10,676 | 10,171 | 505 |
| Arizona | 1,084,281 | 9,118 | 5,585 | 3,533 |
| Arkansas | 463,088 | 8,988 | 8,402 | 586 |
| California | 6,259,972 | 11,300 | 8,486 | 2,814 |
| Colorado | 756,615 | 8,901 | 8,861 | 40 |
| Connecticut | 562,285 | 11,168 | 12,436 | (1,268) |
| Delaware | 120,257 | 10,973 | 12,036 | (1,063) |
| District of Columbia | 65,456 | 13,533 | 15,508 | (1,975) |
| Florida | 2,627,784 | 9,186 | 7,762 | 1,424 |
| Georgia | 1,559,828 | 9,814 | 8,534 | 1,280 |
| Hawaii | 181,225 | 9,578 | 9,879 | (301) |
| Idaho | 259,198 | 8,333 | 7,042 | 1,291 |
| Illinois | 2,039,114 | 11,011 | 9,456 | 1,555 |
| Indiana | 1,024,573 | 9,710 | 8,935 | 775 |
| Iowa | 476,656 | 8,356 | 7,807 | 549 |
| Kansas | 450,067 | 8,795 | 8,373 | 422 |
| Kentucky | 636,647 | 9,138 | 8,300 | 838 |
| Louisiana | 631,198 | 9,196 | 8,519 | 677 |
| Maine | 193,604 | 8,796 | 11,285 | (2,489) |
| Maryland | 835,801 | 10,399 | 9,771 | 628 |
| Massachusetts | 947,292 | 10,823 | 12,596 | (1,773) |
| Michigan | 1,679,337 | 10,513 | 9,880 | 633 |
| Minnesota | 827,346 | 9,504 | 9,675 | (171) |
| Mississippi | 480,687 | 9,116 | 7,215 | 1,901 |
| Missouri | 899,857 | 8,737 | 7,840 | 897 |
| Montana | 144,339 | 8,322 | 8,361 | (39) |
| Nebraska | 280,183 | 8,422 | 7,900 | 522 |
| Nevada | 408,574 | 9,036 | 6,755 | 2,281 |
| New Hampshire | 202,630 | 8,731 | 10,206 | (1,475) |
| New Jersey | 1,307,390 | 11,802 | 13,781 | (1,979) |
| New Mexico | 320,688 | 9,299 | 8,622 | 677 |
| New York | 2,668,050 | 11,768 | 13,551 | (1,783) |
| North Carolina | 1,406,589 | 8,970 | 7,675 | 1,295 |
| North Dakota | 97,231 | 7,961 | 7,807 | 154 |
| Ohio | 1,809,892 | 9,807 | 10,034 | (227) |
| Oklahoma | 597,519 | 8,722 | 6,944 | 1,778 |
| Oregon | 550,028 | 9,695 | 8,649 | 1,046 |
| Pennsylvania | 1,817,450 | 10,405 | 10,711 | (306) |
| Rhode Island | 151,734 | 10,486 | 11,089 | (603) |

*(continued)*

**Table 6 (continued)**

| State | K-12 Enrollment | 05-06 Adequacy Cost Per-Pupil ($) | 05-06 Expenditures Per-Pupil ($) | Additional Cost Per-Pupil ($) |
|---|---|---|---|---|
| South Carolina | 679,940 | 9,106 | 8,377 | 729 |
| South Dakota | 120,795 | 7,643 | 7,911 | (268) |
| Tennessee | 929,381 | 8,916 | 6,979 | 1,937 |
| Texas | 4,317,427 | 9,225 | 7,547 | 1,678 |
| Utah | 504,497 | 8,056 | 5,347 | 2,709 |
| Vermont | 92,457 | 9,069 | 12,475 | (3,406) |
| Virginia | 1,194,594 | 9,324 | 9,275 | 49 |
| Washington | 1,019,250 | 9,289 | 7,958 | 1,331 |
| West Virginia | 271,723 | 9,207 | 9,886 | (679) |
| Wisconsin | 843,956 | 9,330 | 9,965 | (635) |
| Wyoming | 83,970 | 8,983 | 11,596 | (2,613) |
| | 47,751,099 | 9,940 | 9,075 | 864 |

When state average teacher salaries and benefits are used, the estimated weighted average cost per pupil of the evidence-based model amounts to $9,940. The total cost of this model amounts to $41.3 billion (9.5% increase), or $54.6 billion (12.6% increase) if excess funds are not recaptured from high-spending states.

As one might expect, states with relatively low per pupil spending today generally require larger per pupil increases in funding, whereas high-spending states generally raise and spend more than called for by the evidence-based model. However, a number of anomalies appear in the data presented in Tables 5 and 6. For example, Wyoming appears to spend considerably more than the adequacy model calls for—despite being one of two states that used an evidence-based approach to estimating school resource needs.

Wyoming spends $3,269 per pupil more than the model estimate using national salary data and $2,613 more than the model when Wyoming average teacher salaries are used. This is likely the result of differences between the core evidence-based recommendations and policy decisions made by the Wyoming legislature. For example, class sizes for core teachers are 16 in grades K-5 and just 21 in grades 6-12 in the Wyoming model. In addition, the state made substantial adjustments in the funding model to accommodate the diseconomies associated with the operation of small schools and districts. The Wyoming model includes a full-time principal and librarian for elementary schools with 96 students and for secondary schools with

105 students. It also contains minimum numbers of teachers in small schools. For example, elementary schools with between 49 and 96 students are funded for a total of 6 teaching positions (one for each grade), whereas middle schools with more than 49 students receive a minimum of 8 teachers and high schools over 49 a minimum of 10 teachers. Finally, schools with fewer than 49 students are funded at the rate of one assistant principal plus one teacher position for every 7 students. There are a number of other examples in which the Wyoming legislature elected to fund schools at levels that exceed the core recommendations of the evidence-based model, leading to the large difference between the state's funding level and that estimated by the model for this study.

The logical question that flows from this information about Wyoming is, has the implementation of an evidence-based funding model led to improvements in student performance? Subsequent work on this question suggests that in the first 3 years of implementation, those districts that more closely followed the prescriptions of the evidence-based model have seen larger increases in student performance than those that have not made similar changes. However, these results are based on preliminary research funded by the legislature in Wyoming and are part of ongoing research to answer that question.

Alaska presents another interesting analysis. When national salaries are used, the state appears to spend more than the estimated adequacy level, but when Alaska's average teacher salaries are used to estimate the cost of adequacy, the state falls $505 per pupil short of the model's estimate. California, on the other hand, appears to underspend by $1,965 per pupil when national average teacher salaries are used, but the spending gap increases to $2,814 per pupil when California average teacher salaries are used. This is a result of California's high teacher salaries compared to the rest of the states.

Not all states with high teacher salaries are underfunded compared to adequacy. New York, New Jersey, and Connecticut—all states with high average salaries—spend more per pupil than the evidence-based model estimates in both models.

Arkansas, which used the evidence-based model for its new funding formula, spends less than the core adequacy recommendations using actual state salaries. This is probably because the system adopted, and declared constitutional, had larger elementary class sizes and somewhat less support for struggling students.

The data in Tables 5 and 6 show states spending both above and below what the core recommendations from the evidence-based model would

suggest. States certainly have latitude to decide on appropriate spending levels, apparently even when faced with a court order to adequately fund schools. Moreover, the data suggest that the country is far closer to providing adequate revenues for public schools than many might have concluded.

## Conclusions

This article describes an evidence-based approach to estimating the costs of school finance adequacy on a state-by-state basis. It is the first time anyone has attempted to develop a state-level analysis using a model with consistent assumptions across all 50 states plus the District of Columbia. The results are surprising. Whether the costs are estimated using national average salaries for teachers or using state average teacher salaries, just more than half of the states do not provide enough funding at the present time to fully fund the evidence-based model, the others appear to spend more that the model suggests.

If the "excess" funds are not "recaptured" from the high-spending states, which is the reasonable assumption, the cost of the evidence-based model could be achieved with a funding increase of just less than 13%. Although this represents a significant jump in education spending, it is not totally out of reason over time. The difficulty is finding a mechanism to fund those states that are currently underspending. Although federal resources seem to be an obvious solution, particularly to compensate for wealth differences across the states, some of the issues appear more complex. California, for instance, appears to be severely underspending for education compared to the evidence-based model, yet it remains one of the nation's wealthier states. Thus, if the federal government stepped in to fund education at a higher level in California, there would doubtless be hue and cry from other states that have made their own fiscal efforts to spend more on schools, without the help of the federal government.

It also must be pointed out again that the estimates reported here do not take into account cost differences that result from diseconomies of scale or decisions to have larger or smaller core class sizes. Many states have adjustments in their formulas for small schools, and when implemented in an individual state, a series of carefully documented adjustments is made to prorate resources to smaller schools and adapt the evidence-based model to the actual school conditions found in that state. As a result, it is likely that the costs of adequacy reported here represent a lower bound of the total costs that might be identified if evidence-based studies were done in each of the 50 states.

Another issue this article does not address is how the funds should be allocated once they are sent to school districts. This is a particularly important point because a number of states currently spend more than identified in this evidence-based model yet do not appear to show the kinds of gains in student performance the model suggests are possible. We could only speculate as to why that is the case, but it likely has to do with how the dollars that are available are used by the schools and school districts. Some states have a view that districts should have substantial if not total leeway in how they spend their revenues, whereas others control school district spending more tightly. In our research in Arkansas (Mangan, Odden, & Picus, 2009) and Wyoming (Picus, Odden, Aportela, Mangan, & Goetz, 2008), we have found that absent some requirement about how schools and districts should allocate resources, spending patterns substantially diverge from those identified in the model. That divergence is not a problem per se, but if student performance does not increase in districts that do not implement the state's funding model, state officials might ask if the problem is implementation, not lack of funds.

Finally, in some states, the cost of implementing this, or any other, adequacy model might be quite high. Our sense is that states do not have to do this all at once. Instead, they can establish a multiyear implementation plan and fund the increase over time. If they do that, our recommendation is that they start with the professional development components (instructional coaches, additional resources for trainers, and additional days for teacher professional development), then focus on strategies for struggling students. These are relatively low-cost options with larger effect sizes.

## Notes

1. For example, three adequacy studies conducted in Kentucky in 2003 offered estimates of $740 million (Odden, Picus, & Fermanich, 2003), $1.2 billion (Verstegen, 2003), and $1.8 billion (Picus, Odden, & Fermanich, 2003). Recent adequacy work completed in California also exemplified how the approach used by researchers drastically affects suggested increases in spending; these studies suggested spending increases from $17 to $32 billion per year (Chambers, Levin, & DeLancey, 2006; Sonstelie, 2007).

2. It could be argued that to be policy relevant all four approaches should be estimated. Unfortunately, it is not possible to do so across all 50 states in a consistent manner. Data availability to estimate cost functions varies considerably from state to state, making findings from multiple state cost function estimates impossible to accurately compare. Professional judgment studies require empanelling groups of experts in each state—an effort for which resources simply are not available and that would also be likely to result in highly variable models of adequacy across the states. Finally, a successful school or district study requires agreement on the standards to be used to define successful schools—which are likely to vary

across states. Thus, the advantage of the evidence-based approach is that its use of extant educational research and focus on best practices take the best of both and apply them in a neutral and consistent way across all 50 states, enabling more accurate comparisons. We are sensitive to arguments that the evidence base is idiosyncratic to our views and in response have designed our cost model with extensive flexibility to enable estimation of alternative models based on other interpretations of the research. What we present here reflects our understanding of research and best practice, but we encourage others to model the costs of alternative interpretations of that research.

3. State-specific adjustments can have a considerable impact on the final estimate of adequacy. For example, Wyoming provides a number of large adjustments for isolated schools, small schools, and small districts. As a result, the adequacy level determined through a state-modified evidence-based approach in that state is considerably higher than the number we calculate in this report. The difference is because here we rely on statewide data with no adjustments for diseconomies associated with small district and school size, issues that are of considerable importance to Wyoming policy makers. In Arkansas, legislators chose class sizes that are larger than our model and enacted fewer programs for struggling students. As a result, the cost estimates in this article are higher than the estimates derived from that state's evidence-based adequacy study (Odden et al., 2003; Odden, Picus, & Goetz, 2006). Furthermore, state courts in both states found the legislative decisions constitutional. Thus, there is considerable precedent to give state legislators significant leeway in addressing the issue of school finance adequacy.

4. This section borrows from Odden, Goetz, and Picus (2008).

5. At-risk students are generally the number of students eligible for the federal free or reduced-price lunch program, sometimes with adjustments for students in high school, where lunch eligibility is typically underreported.

6. The only exception to this is Hawaii, where there is one school district. In Hawaii, funding flows from the state (which is also the district) directly to schools.

7. Revenue generation would be subject to the constitutional, legal, and political situation in each individual state; the purpose here is to estimate the level of funding required to fully fund the evidence-based model. Adequate figures are compared to actual state expenditure data from National Education Association's (NEA) 2005-2006 data. These data do not address intrastate inadequacies (NEA, 2007).

8. Many states use average daily membership or average daily attendance in all or part of their school finance formulas. This study, to facilitate cross-state comparisons, uses student enrollment (i.e., head count) to estimate costs (National Center for Education Statistics [NCES], 2007).

9. Data for students eligible for special education services were not available via NCES common core of data (CCD) for Missouri. Data for students eligible for English language learner services were not available via NCES CCD for Illinois, New Hampshire, North Dakota, Pennsylvania, and Tennessee. NCES CCD data were supplemented for these categories by various organizations, primarily state educational agencies.

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