THE ADEQUACY AND FAIRNESS OF STATE SCHOOL FINANCE SYSTEMS

FOURTH EDITION
DECEMBER 2021

ALBERT SHANKER INSTITUTE

RUTGERS
Graduate School of Education

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THE ADEQUACY AND FAIRNESS OF STATE SCHOOL FINANCE SYSTEMS

FOURTH EDITION

School Year 2018-19

schoolfinancedata.org

Bruce D. Baker
Matthew Di Carlo
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Dedicated to Eadie Gerber Shanker (1933-2020)

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EXECUTIVE SUMMARY

In the United States, K-12 school finance is largely controlled by the states. The inner workings of individual states' systems are complex, often driven by a gridwork of funding rules and formulas that have evolved over decades of political wrangling, legislation and litigation. In many states, only a small group of people possess full knowledge of how billions of public dollars make their annual migration from states to districts to schools and classrooms.

Yet the stated goal of each of these systems is to provide all students, regardless of their backgrounds or circumstances, with the opportunity to achieve common (and hopefully desirable) educational outcomes.

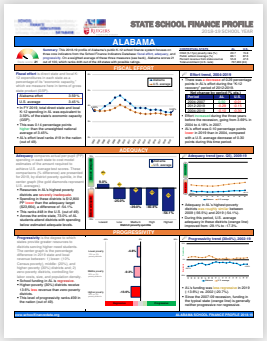
A handful of states do this reasonably well. But most do not.

In this report, we evaluate the K-12 school finance systems of all 50 states and the District of Columbia. We assess each system (and the U.S. overall) using a small set of measures focused on how much states leverage their capacity to fund schools (fiscal effort), how that money is distributed (progressivity) and, most importantly, whether it is enough to meet common outcome goals (adequacy).

These three measures are calculated using state-of-the-art methods and data from over a dozen different sources. They are designed to provide a succinct but nuanced and informative overview of each state's system that is accessible to all stakeholders. The latest year of data presented in this report is 2019 (the 2018-19 school year), but we also examine trends in our measures going back as far as the mid-1990s.

State Profiles

Accompanying this report are single page profiles of the school finance systems of all 50 states and D.C.



DOWNLOAD YOUR STATE'S PROFILE

The measures presented in this report, and many others, are freely available to download as part of our full state database, along with accessible user guides, online data visualization tools and other resources at the SFID project website: schoolfinancedata.org

Our results on effort, adequacy, and progressivity can be summarized by **10 major findings** about the overall state of K-12 school finance in the U.S.

FISCAL EFFORT

How much of states' capacity goes to K-12 schools?

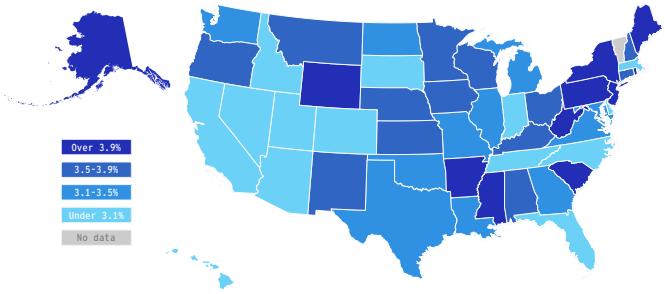
Fiscal effort (or just "effort") is total state and local expenditures in each state as a proportion of its gross state product. Effort indicators allow one to assess how much states leverage their ability to raise revenue, and thus to differentiate states that lack the capacity to meet their students' needs from those that simply refuse to devote sufficient resources to their public schools.

1. THE PROPORTIONS OF STATES' ECONOMIES DEVOTED TO SCHOOLS VARY WIDELY.

- Effort ranges from roughly 2.5 percent of gross state product in Hawaii and Arizona to 4.5 percent in New Jersey.
- In other words, at New Jersey's effort level, spending in Hawaii and Arizona would increase 80 percent.

See Figure 3 for state estimates and information on measures.

K-12 fiscal effort by state, 2019

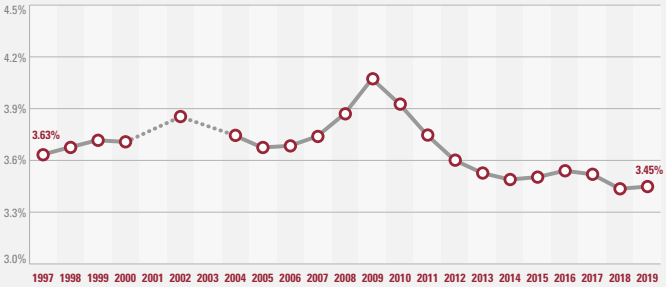


2. U.S. AVERAGE EFFORT IS AT ITS LOWEST LEVEL IN AT LEAST 20 YEARS.

- In 37 states, effort is lower than it was, on average, during the four years before the 2007-09 recession.
- Even after their economies recovered, most states failed to reinvest in their schools.

See Figure 5 for information on measures.

National K-12 fiscal effort trend, 1997-2019



3. DECREASING EFFORT SINCE 2007 "COST" U.S. SCHOOLS ALMOST $70 BILLION IN 2019 ALONE.

- As an illustration, if all states had restored their average 2004-07 effort levels by 2019, total spending would be $67 billion (roughly 10 percent) higher.
- The total cumulative "loss" between 2013 and 2019 is $400 billion, 9 percent of total spending over this time period.

Not available for DC and VT. See Figure 6 for state-by-state estimates.

How would states' 2019 school funding change if they all restored their pre-recession (2004-07) effort levels?

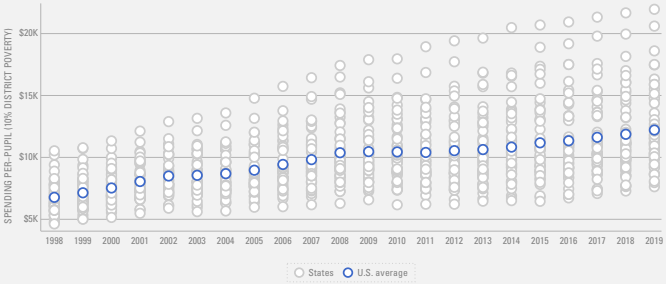
6	17	14	3	9
states' spending would increase 20% or more	states' spending would increase 10-20%	states' spending would increase 1-10%	states' spending would not change (+/-1%)	states' spending would decrease (8 by <10%)
AZ, FL, HI, ID, IN, MI	CA, GA, MA, ME, MI, MT, NC, ND, NM, OH, OK, SC, SD, TN, TX, WI, WV	AL, AR, CO, IL, KY, MD, MO, NH, NJ, NV, NY, PA, UT, VA	IA, MN, NE	AK, CT, DE, KS, LA, OR, RI, WA, WY

4. INTERSTATE INEQUALITY OF EDUCATION FUNDING IS INCREASING.

- The gap between the 10 highest- and lowest-spending states increased approximately 250 percent between 1998 and 2019.
- Much of this increase occurred after the 2007-09 recession, largely because some states restored funding but most did not.

See Figure 7 for information on measures.

Current education spending by year, 1998-2019



ADEQUACY

Do states spend enough to meet common outcome goals?

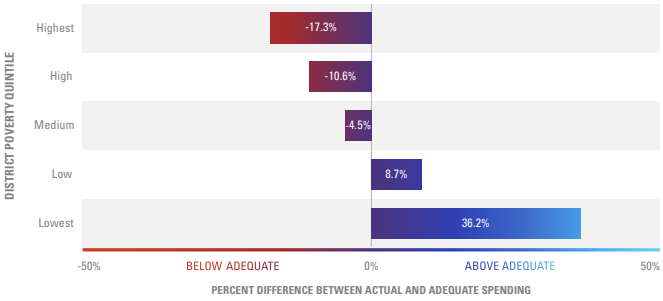
Whereas effort measures how hard states work to raise funds for their public schools, adequacy addresses whether the amount raised is enough. Our adequacy measures compare each state's actual education spending, by district Census poverty level, to cost model estimates of spending levels that would be required in that state to achieve the (modest) common goal of U.S. average test scores.

5. EDUCATIONAL OPPORTUNITY IN THE U.S. IS HIGHLY UNEQUAL.

- In states' highest-poverty districts, on average, actual spending is 17 percent below estimated adequate levels. In 18 states, this negative funding gap is more than 30 percent under adequate levels.
- Only 8 states spend below our adequacy targets in their lowest-poverty (wealthiest) districts, and the average gap is +36 percent.

See Figure 9 for information on measures.

U.S. school funding adequacy by Census district poverty, 2019

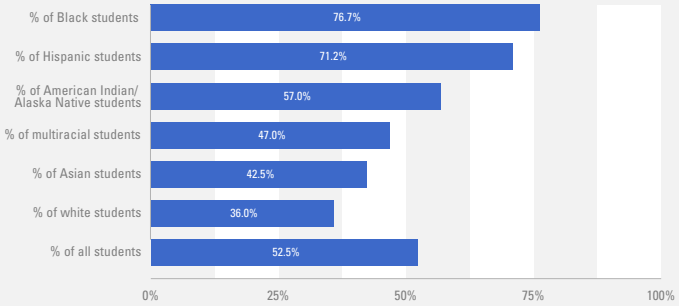


6. THERE ARE STARK DISCREPANCIES IN FUNDING ADEQUACY BY STUDENT RACE AND ETHNICITY.

- Black/African-American and Hispanic/Latinx students are twice as likely as white students to be in underfunded districts.
- Spending is 21 percent below adequate in the typical Black/African-American student's district, and 13 percent below for the typical Hispanic/Latinx student. In contrast, the average white student's district spends 21 percent *above* adequate levels.

See Figure 13 for information on measures.

Percent of students in underfunded districts by race and ethnicity, 2019

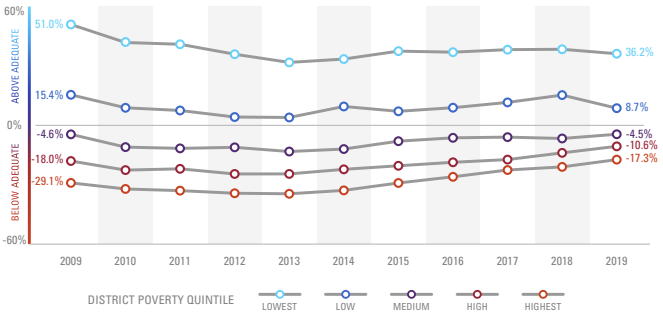


7. ON AVERAGE, K-12 FUNDING HAS BECOME MODERATELY LESS INEQUITABLE SINCE 2009.

- The average negative funding gap in states' highest-poverty districts improved about 12 percentage points between 2009-19, while the positive gap declined about 15 points for the wealthiest districts.
- Our adequacy measures begin in 2009, and so we cannot say whether this trend represents recovery from the recession or a longer-term improvement.

See Figure 10 for information on measures.

U.S. school funding adequacy trend by Census district poverty, 2009-19



8. STATES COULD CUT THE TOTAL U.S. FUNDING GAP IN HALF BY RETURNING TO THEIR EFFORT LEVELS FROM JUST 15 YEARS AGO.

- Average 2004-2007 effort levels would produce enough additional funding to eliminate 2019 funding gaps in 16 states, and to reduce the gaps more than 50 percent in 7 states.
- Overall, pre-recession effort levels could reduce the total U.S. funding gap by 51 percent.

DC, HI, VT and WY unavailable. See Figure 17 for state-by-state estimates.

How much of their 2019 adequate funding gaps could states close if they restored pre-recession (2004-07) effort levels?

16 states could completely eliminate funding gaps

7 states could reduce gaps by at least 50%

9 states could reduce gaps by 25-50%

4 states could reduce gaps by up to 25%

11 no effect: effort higher in 2019 vs. 2004-07

PROGRESSIVITY

Do high-poverty districts receive more funding than low-poverty districts?

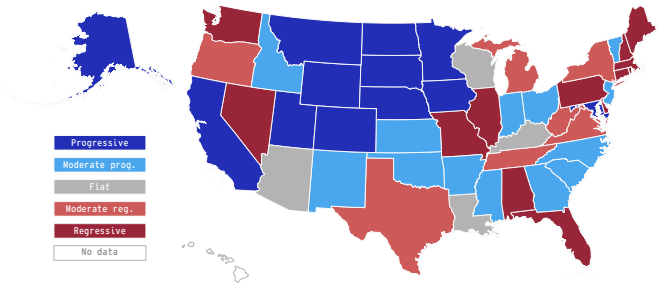
Progressive funding systems are those in which higher-poverty districts receive more resources than lower-poverty (wealthier) districts. Progressivity (or "fairness") is important because students from marginalized backgrounds tend to require more resources than their more affluent peers to achieve the same outcomes. Our progressivity measures compare adjusted state and local revenue between states' high-poverty (30% Census poverty) and lowest-poverty (0%) districts.

9. IN MOST STATES, K-12 FUNDING IS EITHER REGRESSIVE OR, AT BEST, MODESTLY PROGRESSIVE.

- In 20 states, high-poverty districts receive less funding than do the lowest-poverty districts (i.e., funding is "regressive").
- In only 12 states do high-poverty districts receive at least 10 percent more than the lowest-poverty districts.

See Figure 19 for state estimates and information on measures.

K-12 revenue progressivity by state, 2019

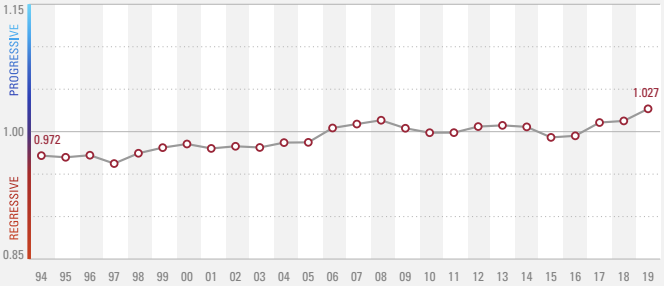


10. ON AVERAGE, U.S. SCHOOL FUNDING HAS BEEN NON-PROGRESSIVE FOR AT LEAST 25 YEARS.

- Since 1994, high- and low-poverty districts receive roughly the same amount of revenue—i.e., funding is neither progressive nor regressive.
- But it has improved somewhat, going from nominally regressive throughout the 1990s and early 2000s to nominally progressive in 2019.

See Figure 20 for information on measures.

National K-12 revenue progressivity trend, 1994-2019



The primary conclusions from these findings are that t**he vast majority of states are failing to provide adequate and equitable funding for their students, and that this failure is due largely to policy choices**. States, on average, are devoting smaller shares of their economies to schools than at any point in the past two decades, and the revenue they do raise is in many cases distributed inequitably. It is hardly surprising that only a handful of states fund their highest-poverty districts adequately.

Yet addressing this problem is not unfeasible. For instance, restoring pre-recession effort levels could make a large dent in states' adequate funding gaps. This is not some utopian pipe dream—these levels were the reality just 15 years ago. In addition, federal funds should be targeted based not only on need but also at states in which effort is relatively high but low capacity constrains the ability to raise enough revenue to meet students' needs.

Our findings also highlight the enormous heterogeneity of school funding, both within and between states. And, to reiterate, the situation is not uniformly bad. There are, in fact, a few states in which resources are generally adequate and distributed equitably, and there are relatively few that perform poorly on all three of our core measures. Such diversity is no accident. So long as school finance is primarily in the hands of states, the structure and performance of systems is likely to vary substantially between those states.

The upside of this diversity is that it has allowed researchers to study how different systems produce different outcomes and, as a result, we generally know what a good system looks like. It is our hope (and intention) that the data presented in this report will inform school finance debates in the U.S., and help to guide legislators toward improving their states' systems.

1 INTRODUCTION

Public school finance in the United States is largely controlled by states. Every year, hundreds of billions of dollars in public funds are distributed based on 51 different configurations of formulas, rules and regulations to over 13,000 districts that vary quite dramatically in terms of the students they serve, their ability to raise revenue locally and many other factors. In most states, only a handful of insiders fully understand all the intricate details of their systems.

Yet what goes on under the proverbial hoods of these systems has serious consequences for U.S. schoolchildren. Over the past decade or so, there has emerged a political consensus regarding schools, money and state school finance systems. This consensus—that money does, indeed, matter—is supported by a growing body of high-quality empirical research regarding the importance of equitable and adequate financing for providing high-quality schooling to all children (e.g., Baker 2017, 2018; Lafortune et al. 2018; Candelaria and Shores 2019; Jackson 2020; Jackson et al. 2021).

There are, of course, serious and often important debates about how education funding should be spent. Without question, how money is spent—and on which students—also matters. Yet virtually all potentially effective policies and approaches require investment, often substantial investment. And schools can't decide how best to spend money unless they have money to spend.

In this report, we evaluate the performance of the K-12 finance systems in all 50 states and the District of Columbia. We focus on three measures: **fiscal effort** (how much states spend as a proportion of their economies), **adequacy** (whether spending is enough to achieve common outcome goals) and **progressivity** (whether higher-poverty districts receive more resources than lower-poverty districts). We refer to these as our "core indicators," as we believe that as a group they provide a concise summary of whether and how states are fulfilling their responsibility to fund their public schools properly.

The purpose of state school finance systems

A state school finance system is a collection of rules and policies governing the allocation of state and local school funding. Local revenue for K-12 schools is drawn mostly from taxation of residential, commercial and industrial properties within geographical areas defined by state law as public school districts. Sometimes district boundaries line up with other municipal definitions (e.g., counties, cities), and sometimes they do not. State revenue, on the other hand, typically comes from a common "pool" fueled mostly by state taxes on income and sales. It is usually allocated according to a set of complex funding formulas that have evolved over time through legislation (and litigation).

States largely control the collection and distribution of both state and local K-12 funding, and these two sources represent the vast majority of all public school revenue. In 2019, 46.7 percent of K-12 revenue came from state sources, 45.6 percent from local sources, and the rest (just under 8 percent) from federal aid programs (U.S. Census Bureau 2021). These proportions, however, can vary a bit from year to year, and they do vary quite substantially from state to state.

Yet the common stated purpose of these state systems is for all districts to have resources sufficient to provide their students with an opportunity to achieve some common—and hopefully desirable—level of educational outcomes.

Ideally, states would achieve this goal by:

1. Accounting for differences between districts in the costs of achieving equal educational opportunity (e.g., districts serving larger proportions of disadvantaged students will generally have to spend more to achieve the same outcomes); and
2. Distributing state revenue to compensate for the fact that some districts have greater local capacity than others to pay those costs (e.g., via local property taxes).

In this (idealized) model, each district is assigned a minimum level of funding required to meet its students' needs, and is expected to pay its "fair share" of those costs locally (e.g., a minimum property tax rate). The state then makes up the difference. Most states do in fact use some form of this "foundation funding" approach when allocating revenue to districts (Jackson et al. 2016; Verstegen 2011). Their results, however, differ in practice.

Key concepts: Adequacy and equal opportunity

Insofar as the end goal of state school finance systems should be to provide equal opportunity for all students to achieve a common goals, any evaluation of these systems must include rigorous measures of the costs of achieving those goals. In other words, one needs estimates of adequate funding levels.

Yet adequacy and equal opportunity, as we define them, are distinct concepts (see Box 1). In short, equal opportunity requires that no districts' resources are any further above or below funding targets than other districts' resources, whereas a system with adequate funding is one in which all districts' resources are above targets set based on student outcomes, even if some districts are way above and others just barely so.

Box 1

Defining concepts: Equal educational opportunity and adequacy

Equal educational opportunity exists when all districts' resources are either above or below target levels by approximately the same proportional amount. These target levels can theoretically be determined in any manner, and may or may not vary by district, so long as all districts' actual resources are approximately the same "distance" away from them.

Adequacy (statewide) is achieved when resources in all districts are above target levels set according to student outcome goals, such as national average test scores. In a system with adequate funding, unlike one in which equal opportunity exists, the magnitudes of the differences between actual and target resources can (but need not) vary widely by district—e.g., some districts far above the targets, and some just barely above.

Ideally, funding in a state would be both adequate and provide equal opportunity—i.e., all districts above the student outcome-based targets by roughly the same proportional amount.

But these two terms are independent of each other. This means that *equal opportunity can be preserved even when resources are inadequate*, if all districts' resources are inadequate by roughly the same proportions (e.g., all districts' resources are approximately 15 percent below adequate funding levels). In this case, all students have an equal shot at achieving a given outcome level, but that outcome level is lower than desired.

Conversely, *resources can be adequate but opportunity unequal*, if, for example, resources in some districts are far above the adequacy targets and resources in other districts are only slightly above. Opportunity is unequal in this situation because some students (i.e., those in districts where funding greatly exceeds targets) have a better chance at achieving the desired outcome than do others (i.e., those in districts where funding is only slightly higher than adequate levels) (Koski and Reich 2006).

States' systems should ideally provide both adequate funding and equal opportunity—i.e., funding in all districts is above adequate levels by roughly the same proportional amount.[1] Clearly, a key issue in this framework is how adequate funding levels are determined, for these targets are the central reference point for both adequacy (are districts above the targets?) and equal opportunity (how far above or below?).

It goes without saying that there is no perfect way to calculate funding levels to achieve a given outcome level (and, even if there were some magical formula, there would remain the important issue of how high to set that outcome "bar," which is in many respects a political question). We will describe our approach to measuring adequacy in some detail below. The relevant point here is that adequacy and equal opportunity are related but separable concepts, which (we contend) can be usefully combined by rigorous target funding levels based on student outcome expectations (Baker 2018).

Yet it's also important to understand and assess why and how states achieve these dual goals (or fail to do so). Allocating more resources to higher-poverty districts—i.e., "progressive" funding—is generally required for adequate funding with equal educational opportunity, as costs tend to increase with poverty. But progressivity alone is not nearly enough. It must be coupled with sufficient overall levels of funding to achieve the desired outcomes. Even a highly progressive school funding system will not achieve adequacy if total revenue is too low, as resources will be insufficient in both poor and more affluent districts. States must therefore tap their revenue-raising capacity at a level commensurate with or ideally greater than their costs/needs (e.g., they must put forth enough "effort").

Data and empirical approach

We evaluate state finance systems using data from the **School Finance Indicators Database** (SFID), a set of public data and resources on state and local school finance systems. The primary data product of the SFID is the State Indicators Database (SID), a collection of around 125 state-level variables measuring school funding and resource allocation.

The new release of the SID accompanying this report includes data up to the 2018-19 school year, but many of our measures go as far back as 1993. In building and presenting this system, we rely on the following principles:

1. **Proper funding is a necessary condition for educational success:** Competitive education outcomes require adequate resources, and improving education outcomes requires additional resources.
2. **The cost of providing a given level of educational quality varies by context:** Equal educational opportunity requires progressive distribution of resources, targeted at students and schools that need them most.
3. **The adequacy and fairness of education funding are largely a result of legislative policy choices:** Good school finance policy can improve student outcomes, whereas bad policy can hinder those outcomes.

The importance of context (#2) is critical to our approach to building the SFID, as well as our approach to evaluating states' systems. By context, we mean not only the population a district serves (e.g., poverty), but also the labor market in which it is located, its size and other factors that can affect the "value of the education dollar." Any serious attempt to compare funding between states or between districts within a given state must address the fundamental reality that the "cost of education" is far from uniform.

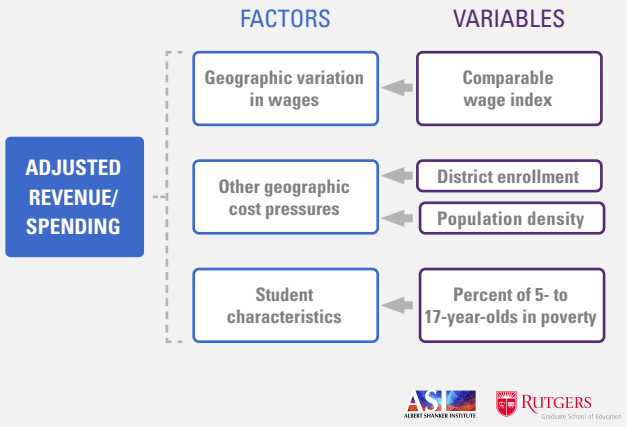
[1] To be clear, the requirement that *all* districts in a given state exhibit both equal opportunity and adequate funding is an idealized goal. In this report, we evaluate adequacy (and, by extension, equal opportunity) using averages across district poverty quintiles (though the district-level adequacy estimates that are used to construct these state-level measures are available at the School Finance Indicators Database website). Moreover, at any given adequacy "bar," equal opportunity in practice is really a matter of degree, rather than an absolute "yes/no" outcome.

Consider, for example, two hypothetical school districts, both of which spend the same amount per pupil. The simple approach to comparing these two districts might conclude that they invest equally in resources, such as teachers, curricular materials, etc., that can improve student performance.

If, however, one of these districts is located in an area where employees must be paid more due to a much more competitive labor market or higher cost of living, or serves a larger proportion of students with special needs, then this district will have to spend more per pupil than its counterpart to provide a given level of education quality. Controlling for these factors does not, of course, guarantee accuracy or comparability, but failure to do so is virtually certain to lead to misleading conclusions.

Figure 1

Adjusted revenue/spending measure



Accordingly, most of the measures in the SID, including those presented in this report (see Appendix Table A1), control statistically for district-level characteristics such as:

1. **Child poverty:** Percent of school-age children (ages 5-17) living in the district with household incomes below the federal poverty line, an important control variable because, in general, districts serving larger shares of higher-needs students require greater resources to provide a given level of education quality (data source: U.S. Census Bureau);
2. **Regional wage variation:** An index of variation in the salaries of college-educated professionals who are not educators, which accounts for variation in labor costs across locations (data source: Comparable Wage Index for Teachers, developed by Dr. Lori Taylor [Taylor and Fowler 2006; Taylor 2014]);
3. **District size:** Number of students served, which accounts for economies of scale in providing services such as transportation (data source: National Center for Education Statistics); and
4. **Population density:** Population per square mile of land area, which we include because the poverty-related costs of education increase with population density (data source: U.S. Census Bureau).

The most important of these factors is child poverty, not only because it exerts strong influence on the cost of providing education, but also because there is now broad agreement among scholars in a variety of disciplines and organizations across the political spectrum that school districts serving higher-needs student populations—those with higher poverty rates in particular—require more resources per pupil than districts serving lower-needs student populations (Duncombe and Yinger 2008). Most of the variables included in the SID are actually the same variable (e.g., adjusted revenue/spending, adequate funding levels, teacher salary competitiveness, etc.) presented at different district poverty levels. (Note that all poverty data used in the SFID are from the U.S. Census Bureau; we do not use free/reduced-price lunch eligibility.)

For instance, our measures of "adjusted" (or "predicted") revenue and spending calculate, in each state and year, revenue/spending for a "typical" district that has: (1) at least 2,000 pupils; (2) average population density; (3) a labor market with national average (within year) external labor cost pressures; and (4) one of four poverty rates (i.e., 0, 10, 20 or 30 percent, yielding four separate variables in the SID).

Adjusted state and local revenue is used directly in our primary **progressivity** measure ("substantial progressivity"), which compares state and local revenue between 30 and 0 percent poverty districts (i.e., revenue predicted at 30 and 0 percent district poverty, controlling for labor costs, size and population density). In addition, the cost model from which our **adequacy** estimates are derived includes these four key variables (and several others). The third measure upon which we focus in this report—**fiscal effort**—is not from a statistical model per se, but it is focused strongly on context insofar as it gauges K-12 spending as a proportion of total economic capacity. All three of these measures are discussed in detail below.

School funding and economic downturns

Finally, events over the past two years merit a brief discussion of the relationship between school funding and overall economic conditions. In mid-2020, the general consensus was that school budgets were about to take a second catastrophic hit in just over a decade, this time due to COVID-19 and the pandemic-fueled economic crisis (Baker and Di Carlo 2020). The outlook, mercifully, has improved. As of late 2021, most states are still reporting expected general revenue below pre-pandemic projections (NASBO 2021), but supplemental federal funding, vaccinations and a faster-than-expected recovery seem to have conspired to improve the situation.

There is, however, still a great deal of uncertainty, with vaccination rates varying widely and new variants of the virus emerging and spreading. In addition, several states hit particularly hard by the pandemic-related economic shock seem likely to enact overall budget cuts, which are virtually certain to affect school funding (NASBO 2021). As always, the severity of these cuts and their impact on school and students will have to be assessed retrospectively.

In the meantime, regardless of how the current fiscal situation unfolds, our data are particularly well-suited to provide important insights into the impact of economic downturns, past, present and future, on school funding. For one thing, our measures go as far back as the mid-1990s. And the effect of past downturns on school funding is the best way to anticipate (and, hopefully, mitigate) the damage of current and future downturns.

Most notably, the impact of the 2007-09 recession on K-12 finance simply cannot be understated (Baker and Di Carlo 2020). Many of the seniors who will graduate this spring may be too young to remember it, but the so-called great recession of 2007-09 almost certainly affected their K-12 experience, and in many cases that impact is still being felt today. We shall focus a great deal on how the severity of this recession, and especially the persistence of the damage it caused, is a big part of the school funding situation over a decade later.

In addition, our measures are fundamentally focused on equity. The majority of variables in our state database, including those presented below, are designed for the comparison of school resources by district poverty, within and between states.

This matters because economic downturns tend to hit particularly hard in higher-poverty districts, largely because higher-poverty districts are more dependent than lower-poverty districts on state revenue (as opposed to local revenue, such as that from property taxes), and state revenue (e.g., sales and income taxes) is typically more volatile during bad economic times. We therefore focus not just on levels and trends in our measures, but specifically on whether and how those levels and trends vary by district poverty.

2 RESULTS

In this section, we report results for our three "core indicators" of fiscal effort, adequacy and progressivity. We have chosen these measures because we believe they provide a succinct but nuanced and informative summary of states' school finance systems. We will present results for each indicator by state and nationally in 2019 in order to characterize the "current state" of K-12 school finance, as well as trends to see how that situation has changed over time.

We describe our three core indicators in greater depth within their respective sections, but they might be briefly defined as follows:

1. **Fiscal effort:** how much of a state's total resources or capacity are spent directly on K-12 education;
2. **Adequacy:** whether states provide sufficient resources to districts, relative to common outcome goals (e.g., national average test scores); and
3. **Progressivity:** whether states allocate more resources to districts serving larger proportions of high-needs students.

Note that, throughout this report, individual years refer to the spring semester of that school year. For example, 2019 means that the data pertain to the 2018-19 school year (the most recent year available).

FISCAL EFFORT

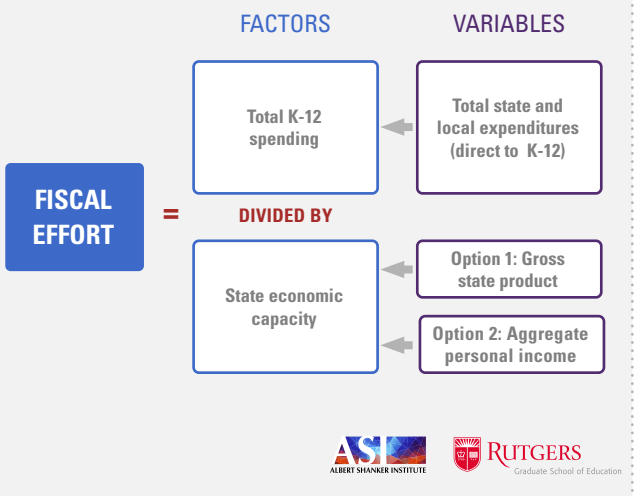
Fiscal effort (or simply "effort") measures how much of a state's total resources are spent directly on K-12 education. In our system, effort is calculated by dividing total expenditures (state plus local, direct to K-12 education) by either gross state product (GSP) or aggregate state personal income.

Both of these denominators are measures of a state's economic capacity; in the simplest terms, how much "money" does a state have from which to fund its schools? In this sense, effort measures how much each state spends relative to its *potential* to spend.

In other analyses, effort has been measured by dividing total education spending by total state and local spending. We believe this is problematic, however, because some states choose not to levy sufficient taxes to support any high-quality public services.

Figure 2

State fiscal effort measure



These states may expend a large proportion of their total governmental spending on schools, but their effort compared to their capacity to spend may still be low. Our effort measures, in contrast, ensure that states don't seem like big education spenders solely because they don't spend much on any public services. They also account for the fact that spending in some states is constrained by the size of their "economic pies," whereas in other states, low spending reflects a refusal to spend enough despite the ability to do so.

Fiscal effort by state in 2019

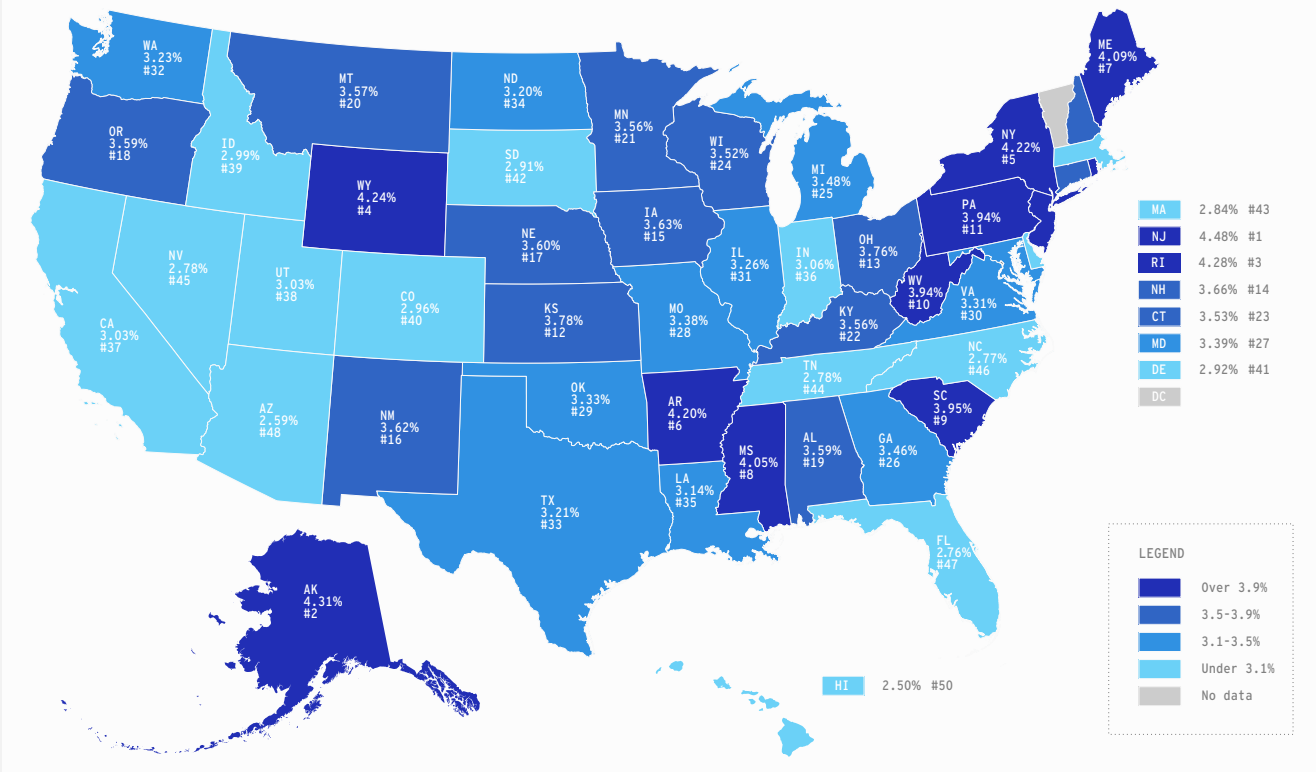
In Figure 3, we present a map of each state's effort as a percentage of its gross state product in 2019 (along with each state's rank). The results for the alternative version of effort (using aggregate state personal income as the denominator) are not presented in this report, as they are similar (the correlation between the two is roughly 0.90), and both can be downloaded as part of our state database. Note that the data are missing (gray shading in the map) for D.C. and Vermont. Effort is not calculated for D.C. in any year, and is not available for Vermont in 2018 and 2019 due to data irregularities.

Figure 3 indicates that effort ranges from approximately 2.5 to 2.6 percent in Hawaii and Arizona to around 4.5 percent in New Jersey. In other words, the amount New Jersey spends directly on its schools is equal to 4.5 percent of its annual GSP, while Arizona and Hawaii spend roughly half as much as a proportion of their GSPs. Were Hawaii or Arizona to increase their effort level to that of New Jersey, direct state and local K-12 spending in those states would increase about 80 percent.

Figure 3

State fiscal effort

Total state and local expenditures (direct to K-12 education) as a percentage of gross state product, by state, 2019



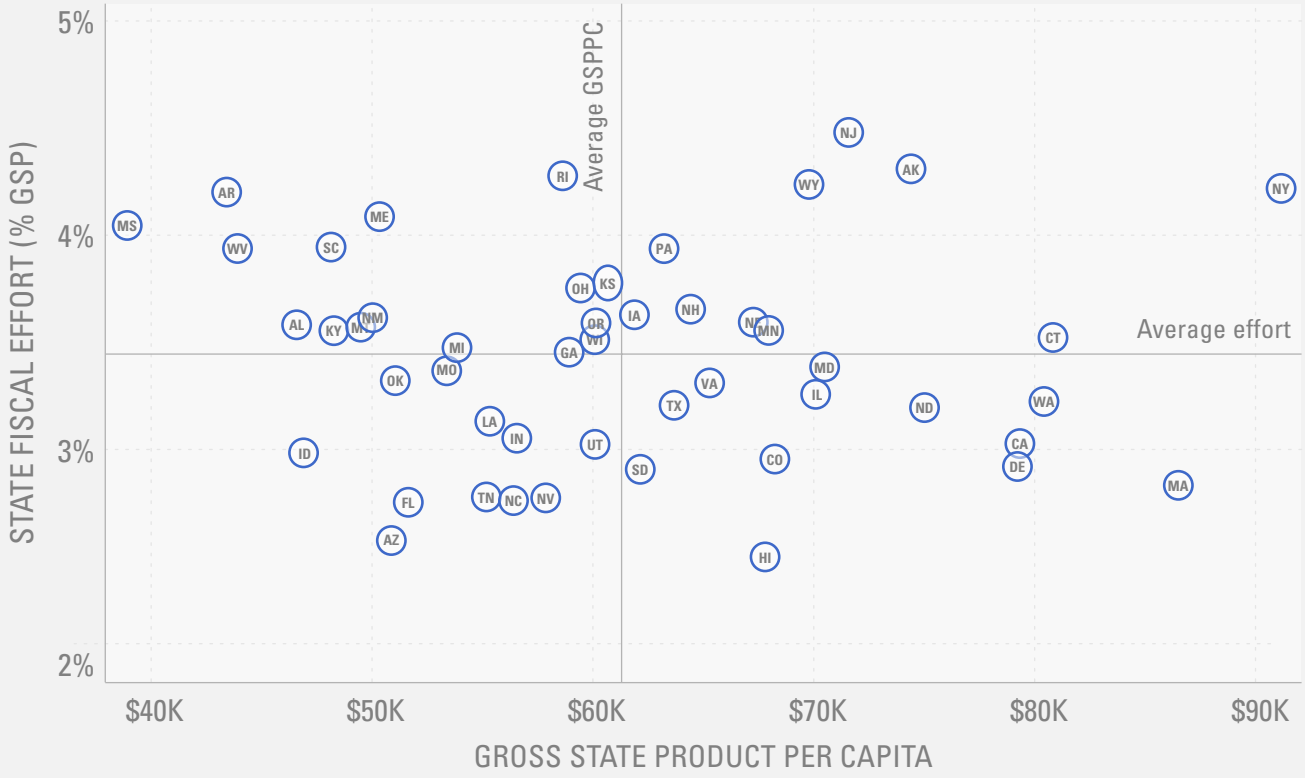
NOTE:
Effort is not available for D.C. and Vermont.
State ranks may reflect differences concealed by rounding.

Source: School Finance Indicators Database

Figure 4

State fiscal effort by GSP per capita

Scatterplot of state and local expenditures (direct to K-12) as a percentage of gross state product by gross state product per capita, 2019



NOTE:
Averages (lines in the plot) are unweighted. Graph does not include D.C. and Vermont (effort not available).

Source: School Finance Indicators Database

Most states are clustered within 0.5 percentage points of the unweighted U.S. average of 3.45 percent. But even seemingly small differences in effort represent large amounts of school funding. As an illustration, in the typical state, a 0.5 percentage point (one-half of one percent) increase in effort would be equivalent to roughly a 15 percent increase in K-12 funding.

When evaluating states' effort levels, we would emphasize once again that states with large economies have larger "pies" from which education might be funded (via taxation). These states can therefore put forth less effort than their counterparts with smaller economies and still spend the same amount on their schools. In other words, while higher effort levels are generally preferable, one should evaluate state effort with an eye on capacity. And there is no consistent relationship between state effort and state capacity.

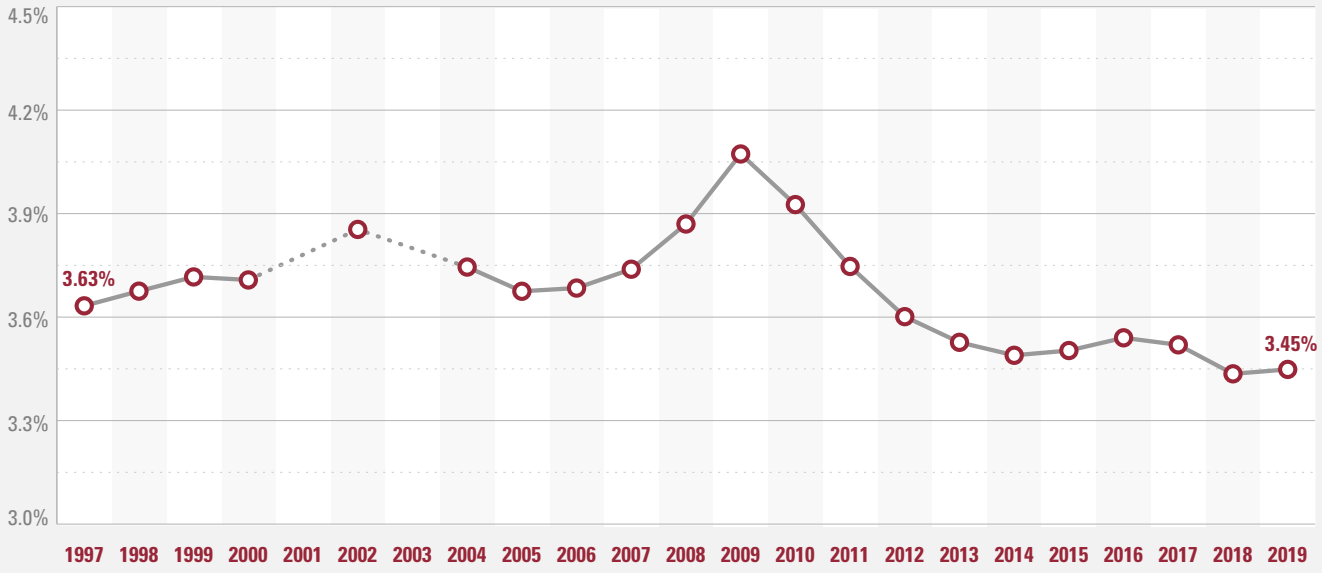
This is clear in Figure 4, which is a scatterplot of effort in 2019 and gross state product per capita (this is our state economic capacity measure, GSP, divided by state population for the purposes of this figure). Overall, the state markers in the plot exhibit no consistent pattern (the correlation coefficient is -0.06).

New York and New Jersey, for instance, are high-capacity states that also put forth above-average effort (the upper-right area of Figure 4), generating copious resources statewide. But there are also a number of states, such as Delaware, Massachusetts and California, that are high capacity and put forth relatively low effort (the lower-right area of the plot). All else being equal, such lower effort levels will have less deleterious implications for education resources in these high-capacity states than they would in states with smaller economies.

Figure 5

National fiscal effort trend

Total state and local expenditures (direct to K-12 education) as a percentage of gross state product, U.S. average, 1997-2019



NOTE:
Averages are unweighted, and do not include D.C. or Vermont (effort not available). Effort is not calculated in 2001 and 2003 due to a change in how Census finance data were collected in these years.

Source: School Finance Indicators Database

In contrast, several states, such as Arkansas, Kentucky, Maine, Mississippi, South Carolina and West Virginia, exhibit rather strong effort, but their relatively limited capacity means that students in those states will be under-resourced vis-à-vis states that put forth similar effort but have greater capacity.

Higher effort is better. There are no states in which K-12 funding is so abundant that additional revenue would not be of benefit to students, particularly those in higher-poverty districts (in theory, the "appropriate" effort level depends in part on a state's needs/costs, a point to which we shall return below). But, to reiterate, two states with equal effort levels might be spending rather different amounts per pupil (e.g., if their economies differ in size), while states with different effort levels might not be very different in terms of funding.

U.S. average effort trend, 1997-2019

States' fiscal effort levels can vary year to year due to changes in their education funding policies, their overall economies (e.g., GSP) or both. Figure 5 presents the national trend in (GSP-based) effort between 1997 and 2019. Once again, the averages do not include D.C. and Vermont (the latter is excluded to keep a consistent set of states across all years).

The figures in the graph are unweighted averages across the remaining 49 states, and they provide a sense of changes over time in how much the typical state is spending as a share of its capacity (the trend for our alternative income-based effort measure is virtually identical). Note that the range of the y-axis in Figure 5 is 3.0-4.5 percent; year-to-year changes would look more or less steep with different scaling.[2]

[2] Effort (both GSP- and income-based) cannot be calculated for either 2001 or 2003. This is because the U.S. Census Bureau collected state and local finance data differently in those two years, and we use these data (total direct K-12 expenditures) as the numerator in our effort calculation.

Effort seems to go up and down over time. One reason for this is the cycle of economic downturns and recoveries, as is particularly clear in the case of the financial crisis and so-called great recession of 2007-09. Effort spiked between 2007 and 2009, and declined sharply between 2009 and 2013.

The initial spike (2007-09) is an "illusion" of sorts, a result of the fact that recessions affect the denominator of the effort equation (capacity) before they affect the numerator. For example, recessions very rapidly cause unemployment (lower personal income) and contraction of states' economies (lower GSP). But school budget cuts often take a little longer to appear (particularly if there is an injection of federal stimulus aid, as there was in 2009). If, as a result, education spending (the numerator) remains relatively stable for a year or two while capacity (the denominator) declines, effort will increase, because the denominator is lower whereas the numerator is relatively flat or declines more slowly. (Note that the same basic spike-and-decline pattern occurred, albeit far less dramatically, between 2000 and 2003, due to a recession in the early part of 2001 followed by the Sept. 11, 2001, attacks.)

Between 2007 and 2009, a time period that includes most of the duration of the "official" recession, effort increased at least somewhat in all but three states (North Dakota, Virginia and West Virginia), which saw moderate decreases. The situation changed dramatically around 2009, as states' economies began to recover. Average effort decreased sharply between 2009 and 2013, going from 4.07 to 3.53, with at least a nominal net decrease during this time in every state except Delaware (where there was a tiny increase). This is a massive drop in U.S. average effort over a relatively short period of time, and, as we'll see, it represents the loss of billions of dollars in education resources.

To reiterate, economic downturns tend to create these up-and-down periods, and the severity of the 2007-09 recession meant that this pattern was also going to be unusually pronounced. What's truly disturbing—and unusual—is the fact that *effort never recovered*. Between 2013 and 2019, when our data end, effort in the typical state remained mostly flat, with the exception of a fairly large single year drop between 2017 and 2018. As a result, the U.S. average effort level was lower in 2018 and 2019 than at any point in recent history.

Only seven states had at least nominally higher effort levels in 2019 than they did in 2007, immediately before the recession. And in some states, the declines are alarming. Most notably, in Michigan, effort dropped almost 1.2 percentage points between 2007 and 2019, going from just under 4.7 percent in 2007 (among the highest of all states) down to roughly 3.5 percent in 2018, just above the national average. In Florida, the net decrease in effort between 2007 and 2019 was close to 1 percentage point, and it was greater than 0.7 percentage points in Hawaii, South Carolina and West Virginia.

These trends are in no small part the result of deliberate choices on the part of policymakers in many states to address their recession-induced revenue shortfalls primarily with budget cuts rather than a mix of cuts and revenue-raising. In fact, a number of states actually *cut* taxes during and after the 2007-09 recession (Leachman et al. 2017). The failure to restore this funding has left schools in many states operating with barely more or even less than they had been operating with a decade earlier.

Illustrating the impact of declining K-12 effort

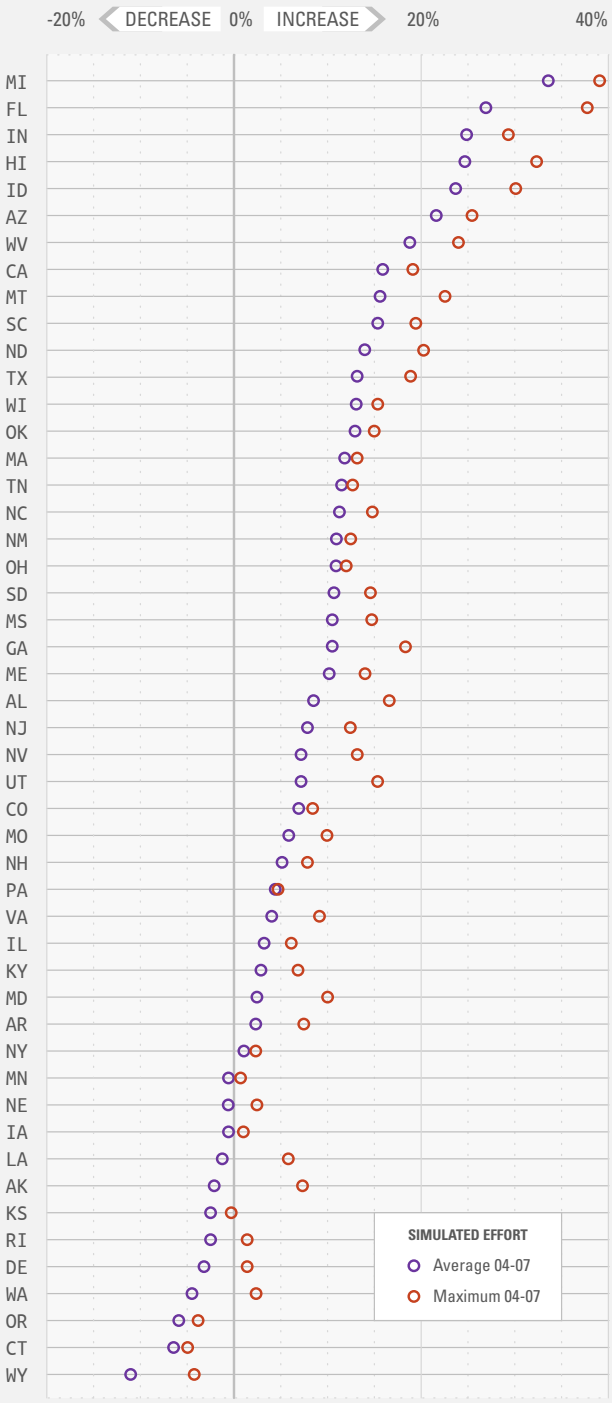
The implications of what seems to be a permanent decline in most states' effort levels are difficult to overstate. The changes in U.S. average effort discussed above may appear small—fractions of one percent—but, to reiterate, they can represent very large increases or decreases in education resources. The denominators of the effort calculation are entire state economies.

One simple way to illustrate the impact of even seemingly trivial changes in states' effort levels, as well as to examine which states saw their effort decline post-recession and by how much, is to "simulate" 2019 spending at each state's pre-recession effort levels—that is, multiplying these prior effort levels by 2019 gross state product in each state—and compare it with their actual 2019 spending.

Figure 6

Change in 2019 funding under 2004-07 effort levels

Percent difference between "simulated" 2019 K-12 spending based on 2004-07 fiscal effort levels and actual 2019 spending, by state



NOTE:
Graph does not include D.C. and Vermont (effort not available).

Source: School Finance Indicators Database

Put differently, what would each state's spending levels be if by 2019 their effort levels had recovered to where they were before the 2007-09 recession?

In Figure 6 we present the percentage difference between this "simulated" spending and actual spending in 2019, by state. We simulate two different hypothetical scenarios: (1) each state's effort level returned to its four-year (unweighted) average from 2004-07 (the purple circles in Figure 6); and (2) each state's effort level returned to its maximum single-year level from the 2004-07 period (the red circles).

Positive changes in Figure 6—i.e., markers to the right of the vertical zero-difference line—represent hypothetical "increases" in total spending (i.e., pre-recession effort in a given state was higher than it was in 2019, and so "simulated" 2019 spending is higher than actual spending), whereas negative changes are found in states where 2019 effort was higher than pre-recession effort levels ("simulated" spending is lower than actual spending). The size of the differences, of course, are also proxies for the magnitude of the net change in each state's (average or maximum) effort between 2004-07 and 2019.

We shall focus mostly on the simulation of average 2004-07 effort (the purple circles), rather than maximum effort during this period, as the former gives a better sense of the pre-recession situation by combining multiple years (the comparison with the maximum effort simulation can be interpreted as a "best-case scenario" in the restoration of pre-recession effort levels).

Unsurprisingly, given the overall effort trend presented in Figure 5, simulated spending is higher than actual spending in 37 of the 49 states in which we calculate effort in 2019 (all but D.C. and Vermont). In those 12 states that are the exception, only one (Wyoming) would see its spending decrease more than 10 percent as a result of the restoration of average 2004-07 effort levels. Two of these 12 states (Alaska and Wyoming) rely heavily on (volatile) revenue from natural resources, and their effort levels can fluctuate quite a bit over time no matter the economic situation. Note also that eight of these states would actually see increases under their maximum 2004-07 effort levels (the red circles).

Among the 37 states in which 2019 spending would hypothetically increase under 2004-07 effort levels, the size of the increases are in many cases substantial. Six states would see increases of more than 20 percent, including a rather shocking increase of 33.5 percent in Michigan. That is, K-12 spending in Michigan would be one-third higher had the state simply recovered to its 2004-07 effort levels by 2019. Another 17 states would see increases between 10-20 percent.

Across all 49 of these states, the total net increase in spending (counting the "losses" in the 12 states where spending would decrease) would be around $67 billion. That is equivalent to almost 10 percent of total 2019 direct state and local K-12 spending in these states. It's also roughly 15 percent more than total federal K-12 revenue in FY 2019. It is an enormous difference.

And it bears emphasizing that this is *just for one year*. The persistent decline in effort since the aftermath of the 2007-09 recession means that most states are, in the context of this illustration, foregoing this additional funding every year. If, for example, we perform this exercise for all years between 2013 and 2019 (replacing each state's effort level in each year with average 2004-07 levels, and multiplying it by GSP in each of those years), the total "loss" in K-12 resources is about $400 billion (9 percent of total spending across these seven years). So long as the typical state's effort level remains at what seems to be its new equilibrium, this counterfactual "price tag" will continue to accumulate.

Effort trends and interstate spending inequality

There is one additional consequence of the effort trends discussed above that is worth discussing quickly. As we've seen, effort, on average, is declining. But we've also shown (e.g., in Figure 6) that not all states failed to recover—in 12 states, in fact, effort was actually higher in 2019 than it was prior to the recession. One side effect of these divergent effort trends has been a sharp rise in interstate inequality of K-12 resources.

Figure 7 contains a scatterplot of per-pupil current spending levels in each state between 1998 and 2019. These spending levels are adjusted for districts' Census poverty rates, labor costs, population density and size, so that they are more comparable between states (see Figure 1). We present spending at the 10 percent district poverty level, which is roughly the average poverty rate, but the results are the same regardless of the poverty level used.

Throughout the late 1990s and the first few years of the 2000s, virtually all states (the vertical group of overlapping gray circles in each year) were clustered within the $5,000 to $10,000 range, a spread of about $5,000 per pupil. Now, to be clear, this is a big span (particularly in these earlier years, when spending was lower), and it represents substantial interstate variation in spending. Even controlling for factors that affect costs, such as poverty and regional wage variation, it has long been the case that some states spend a lot more than others. Starting in the mid-2000s, however, a group of about 5-10 states start to break away from the pack. This divergence was exacerbated by the recession of 2007-09. Spending decreased or stagnated in most states during the 2009-12 time period, which, again, was when the shock of the 2007-09 recession "caught up" to states' spending levels.

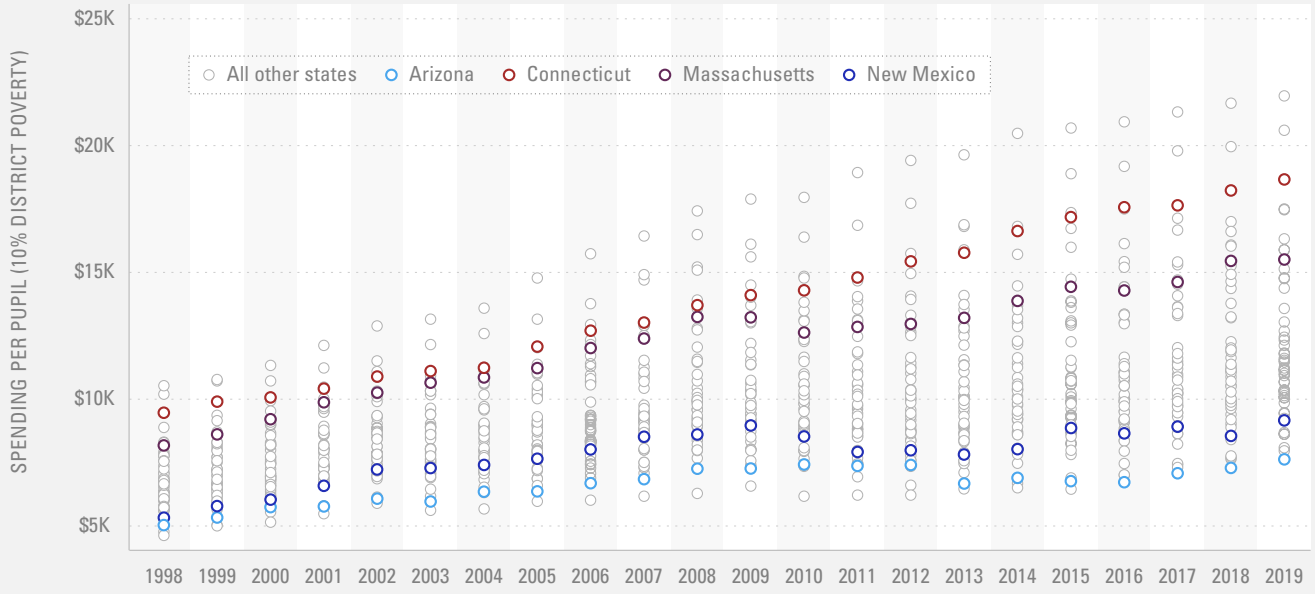
Around 2013, education spending started to recover, but the recovery was unequal. Spending in a bunch of states resumed a positive trajectory, but, in many others, the recession's impact (and policymakers' failure to address it by reinvesting in schools) was more persistent. As a result, by 2019 there were about 12 states that exhibited adjusted spending levels noticeably above the main pack, in stark contrast to the earlier years depicted in the graph, when states were grouped more tightly together. The vertical columns of circles from left to right create a kind of sideways cone or tornado shape. This is basically increasing inequality.

Figure 7 also isolates the trend in a few states to get a better sense of what happened. Arizona (the light blue circles) and New Mexico (dark blue circles) started low in the pack and generally remained low during the 1990s and early- to mid-2000s (though New Mexico did move up a bit). The subsequent (delayed) adverse impact of

Figure 7

State spending by year, 1998-2019

Scatterplot of predicted current spending per pupil at 10 percent district Census poverty level by year, 1998-2019



NOTE:
Total current spending predicted in each state for a district with 10 percent Census child poverty, more than 2,000 students, average population density, and average labor costs. Graph does not include Hawaii and D.C.

Source: School Finance Indicators Database

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the recession on education spending occurred in virtually all states (roughly between 2009-12), but in states like Arizona and New Mexico, there was little reinvestment once economies started to recover around 2013. Consequently, even 10 years after the onset of the recession, adjusted spending levels in these states were not that much higher than they were prior to the recession, and, in many cases, only a few thousand dollars per pupil higher than they were in the early 2000s.

Connecticut (red circles) and Massachusetts (purple circles), like Arizona and New Mexico, also experienced some ill effects of the recession on their school spending. This is particularly true in Massachusetts, where, for example, spending dropped quite a bit between 2009 and 2010 (in Connecticut, spending growth slowed). Yet both states increased or resumed their levels of investment in public schools as their economies recovered. As a result, they are among the states in which adjusted spending continued to rise post-recession, and by 2019 they were two of the highest-spending states in the country.

In any case, these four states exemplify the overall trend of increasing variation in—i.e., inequality of—K-12 funding that has occurred over the past 25 years. While there have always been higher- and lower-spending states, the gaps have widened substantially. As an illustration, the gap between the 10 highest- and 10 lowest-spending states was almost 250 percent larger in 2019 than it was in 1998.

Effort, of course, is not the only factor that explains this divergence. For example, a few of the states atop the adjusted 2019 spending column, including Massachusetts and New Jersey, had lower effort levels in 2019 than they did before the 2007-09 recession. But the effort decreases in these states are mostly modest, whereas they tend to be quite large in the lowest-spending states (strong or weak economic growth can also play a role here). But effort is clearly—and not at all surprisingly, given that spending is the numerator—a big factor. The states that broke away from the pack are generally those that, contrary to the national trend, fully or nearly restored their pre-recession effort levels.

This speaks to the wider point that effort, while it can vary over time due to changes in states' economic conditions (including the impact of recessions), also represents, in large part, a policy choice. Effort levels reflect both the decision to levy sufficient taxes and how the state prioritizes public education. It is clear that the 2007-09 recession temporarily devastated states' economies and thus their K-12 revenue bases, but it is also clear that most states failed to restore prior funding even as their economies recovered (and federal stimulus dollars ran dry). In other words, many states, particularly low-effort and/or high-capacity states, had the means to at least partially cover their losses, but they chose not to do so. As a result, the seniors who graduate in the fall in these states will have spent their entire K-12 careers in public schools that were less well-funded than they had been when those seniors were born.

ADEQUACY

Our adequacy measures are the centerpiece of this report (and of the SFID system in general). This is because they can help us compare states in terms of what is arguably the most important question in school finance: *Is funding enough?* Answering this question, however, is a long-standing challenge for both researchers and policymakers.

In school finance scholarship, "adequacy" is generally defined as the degree to which funding for schools is sufficient for students to reach some minimal (and hopefully meaningfully high) level of educational outcomes. But adequacy is not just an academic construct. As discussed in the introduction, the primary job of states' K-12 finance systems should be to account for differences between their districts in the cost of providing that minimal acceptable level of educational quality, and then to distribute funds in a manner that compensates for the fact that some districts have less ability than others to pay these costs (e.g., via property taxes).

Ideally, the first function—accounting for differences between districts in how much they need—would be based on target spending levels that represent the costs of achieving some common desirable outcome.[3] From this perspective, rigorous adequacy measures can serve as guides for constructing, improving and evaluating state systems. The target cost estimates represent imprecise but reasonable foundation levels of resources that each district needs to provide an acceptable level of educational quality. It is then the job of states to allocate revenue such that state funding fills the gap between the target foundation level and some "fair" local contribution, given differences in localities' ability to raise their own funds.

About our adequacy measures

Our primary measures of funding adequacy come from the National Education Cost Model (NECM), which is part of the SFID, and is perhaps the first education cost model that allows for rigorous evaluation of input-/output-based adequacy not only within all U.S. states (by district poverty), but between these states as well.[4]

[3] Researchers (and policymakers) have used a variety of different approaches to estimating foundation (i.e., adequate) funding levels. These include but are not limited to cost and production functions such as the NECM, which is, of course, our preferred approach (see Baker [2018] for more discussion).

[4] An alternative, albeit rather crude, approach using SFID data is to assess the adequacy of spending (or revenue) in a given state by comparing it with that in other states at a given district poverty level (i.e., comparing "equated" or "adjusted spending" between states). For instance, is spending at a given level of district poverty in a given state high compared with similar districts in other states? We focus here on our NECM-derived adequacy measure, but estimates of equated spending by state and poverty level are presented in Appendix Table A2. The same set of estimates are available to download in the SID going back to 1993, as are 1993-2019 estimates of equated revenue by source (local, state and federal) and district poverty level (0, 10, 20 and 30 percent).

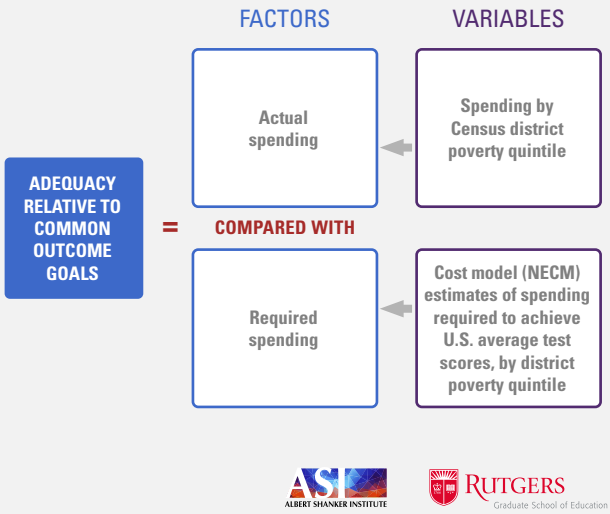
The measures compare actual spending per pupil to estimated (cost-modeled) per-pupil spending levels *that would be required to achieve the common goal of* national average math and English language arts test scores in the previous year.[5] We call these estimates "adequate spending," "required spending" or "cost targets" interchangeably.

This comparison of *actual* and *required/adequate* spending is carried out in each state by district poverty quintile (the 20 percent lowest-poverty districts, 20-40th percentile poverty, 40-60th percentile and so on). We disaggregate by district poverty because the primary goal of state systems should be adequate funding for all students, regardless of their backgrounds, and the estimates across entire states often make it appear as if funding is adequate when in reality it varies drastically by district poverty. Disaggregation is, in other words, important for evaluating equal educational opportunity (see Box 1). Even if funding is adequate overall, opportunity might still be unequal if spending is far above the targets in lower-poverty districts and just barely above in higher-poverty districts.

A few additional points merit brief discussion before moving on to the results. First, even when spending, on average, is adequate for a given state and poverty quintile, this does not mean that spending is adequate *for all districts within that quintile* (and, conversely, inadequate spending overall does not mean all districts in that quintile are funded inadequately). In fact, there is only one state (Wyoming) in which 2019 spending is above our cost targets in every single district for which we have data (our state-level estimates are aggregated district-level estimates). This implies that even in states where funding, on average, is above estimated adequate levels in higher-poverty districts, there are still individual districts that slip through the cracks (Baker et al. 2021).

Figure 8

State spending adequacy measure



Second, that we define adequacy in terms of testing outcomes is not intended to suggest that standardized test scores provide a comprehensive picture of the value of schools or investment in those schools. They do not. They are, however, a benchmark of student performance that can be used to assess, however imperfectly, the adequacy of spending across all states. We also contend that increased spending would benefit other meaningful student outcomes.

We would, finally, emphasize that the bar we are setting here—national average scores—is not a particularly ambitious goal, at least not from the perspective that the aggregate testing performance of U.S. students should improve. We could easily alter our models to set a higher bar, which would increase estimated costs and, thus, the prevalence and severity of below-adequate funding. We choose U.S. average scores because it is a realistic and educationally meaningful goal.

[5] In addition to the SFID's district-level dataset of finance, student characteristics and other variables, the NECM relies heavily on three additional data sources. The first is the Comparable Wage Index for Teachers (Cornman et al. 2019), an index of regional wage and salary variation developed by Dr. Lori Taylor of Texas A&M in collaboration with researchers at the National Center for Education Statistics (Taylor and Fowler 2006; Taylor 2014). The second is the EDGE School Neighborhood Poverty Estimates, also published by the NCES, which is specifically designed to measure poverty surrounding schools and districts (Geverdt 2019). The third and perhaps most important NECM data source is the Stanford Education Data Archive, a groundbreaking database of nationally normed test scores going back to 2009 (Reardon et al. 2021). The SEDA allows for a better comparison of individual district's test results across all states, a crucial tool for producing cost model estimates that are comparable across the United States.

Box 2

The National Education Cost Model (NECM)

The NECM uses a dataset of district-level test scores, funding and numerous other variables between 2009 and 2019. The districts included in the model serve approximately 95 percent of all U.S. public school students (the most common reason why districts are excluded is that they are run by nongovernmental entities that do not report finance data to the U.S. Census Bureau).

The core purpose of the NECM is to account for the fact that the cost of providing a given level of education is not uniform across districts. Perhaps most importantly, districts that serve larger shares of high-needs students (e.g., higher Census child poverty rates) will have higher costs. In addition, other factors, such as labor costs (e.g., districts in areas with higher costs of living will need to pay their employees more to remain competitive), size (economies of scale) and population density, all affect the "value of the education dollar." The model, therefore, first estimates the relationships between district spending and these important factors, including testing outcomes.

Importantly, the NECM accounts for the fact that school funding both affects and is affected by testing outcomes. For example, a district with higher test scores will tend to have higher property values than a district with lower scores. This allows the former district to collect more property tax revenues, which, in turn, boosts spending and positively affects testing outcomes. The NECM uses econometric methods to account for this endogeneity and tease out the causal relationship between spending and outcomes.

This initial model yields a kind of "relationship inventory" of how each factor is related to spending. We then use the "inventory" to predict the cost (spending levels) of achieving a common outcome level (e.g., national average math and reading test scores) for each individual district, based on that district's configuration of characteristics (in a sense, by comparing each district to similar districts).

These "required spending" or "adequate spending" estimates, which are aggregated to the state level (by poverty quintile) can then be compared with actual spending levels. Such comparisons can of course be expressed in different ways (e.g., percentage difference, difference in dollars per pupil, etc.).

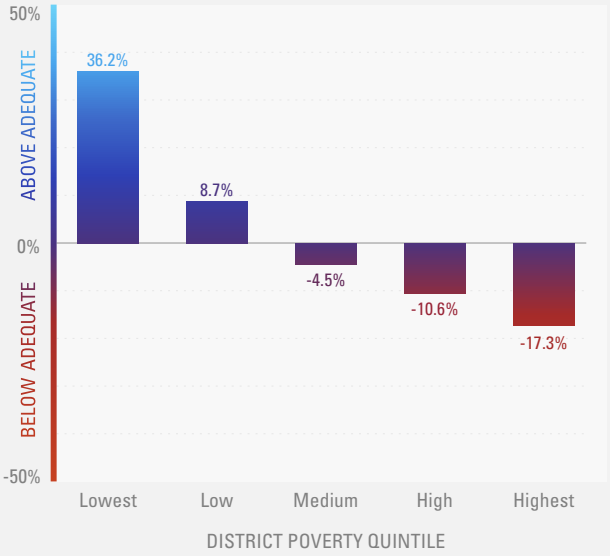
It is important to interpret our adequacy estimates with appropriate caution. They are, needless to say, far from perfect. This is true of all cost models, but the NECM contends with particularly daunting challenges insofar as it is estimating education costs across the entire nation. Most basically, no model can control for everything (researchers call this "omitted variable bias").

Moreover, the variables that we do have are imprecise. For example, our spending data may be biased by differences between states in how spending is tracked and reported to federal agencies (despite the best efforts of the latter). That said, NECM estimates represent reasonable, previously unavailable approximations of spending required to achieve common outcome goals across the nation. For more technical details on the NECM, see Baker et al. (2021) and Baker (2020).

Figure 9

U.S. funding adequacy by district poverty

Average difference between actual spending and estimated spending required to achieve national average test scores, by district Census poverty quintile, 2019



NOTE:
Poverty quintiles defined state by state.
Average differences weighed by enrollment, and do not include D.C., Hawaii and Vermont.

Source: School Finance Indicators Database

Overview of U.S. adequacy in 2019

In Figure 9, we present a summary of adequacy across 48 U.S. states in 2019.[6] The values in the graph represent the average difference between actual and required spending, by district poverty quintile (weighted by enrollment). Positive values indicate actual spending above our estimated required levels, and negative values denote below-adequate spending. Insofar as poverty thresholds are defined state by state, the estimates in Figure 9 are intended only to provide a sense of the national situation when it comes to outcome-based adequacy.

In the "lowest" district poverty quintile (the 20 percent lowest-poverty districts in each state), the average gap between actual and required per-pupil spending is positive and very large (36.2 percent). In the "low poverty" district quintile (20-40th percentile poverty), actual spending is also higher, on average, than our cost targets, by roughly 9 percent. On the whole, states are spending more than enough for their low- and lowest-poverty districts to achieve the common benchmark of national average outcomes, and, in the case of the latter, actual spending is nearly 40 percent higher than the targets.

In the middle, high and highest district poverty quintiles, in contrast, there is a negative average gap between required and actual spending—actual spending is lower than required spending—ranging from approximately -5 percent in the middle-poverty quintile to -17 percent in the highest-poverty quintile.

In other words, on average, districts in states' highest-poverty quintiles spend only about 80 percent of how much they would have to for their students to achieve average math and reading scores (again, this means the national average for all students, regardless of poverty). And the situation in the second-highest poverty quintile is not much better—spending is nearly 11 percent lower than our cost targets.

These gaps are quite striking. They imply that, on average, states are failing to provide equal educational opportunity for their students to achieve the modest common goal of national average test scores.

U.S. adequacy trends, 2009-19

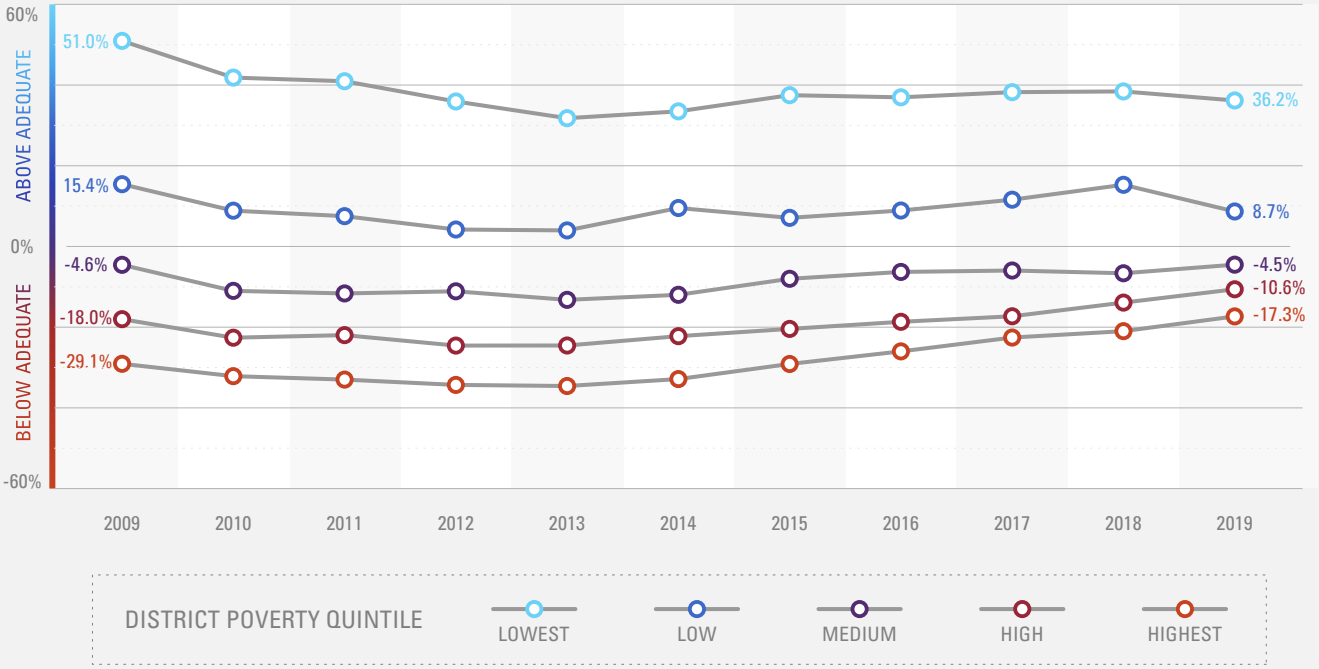
For the first time, we are publishing adequacy estimates for all states going back to 2009 (previously, estimates were only published for the current year). Figure 10 is the same as Figure 9, except the percentage differences by district poverty level are presented for each year between 2009 and 2019.

[6] The national averages presented in this graph (and Figure 10) exclude Hawaii, the District of Columbia and Vermont. Hawaii is always excluded from the NECM, as the state consists of a single, geographically isolated school district (the state does have independently operated charter schools, but they generally do not report finance data to the U.S. Census Bureau, as the operators of these schools are not government entities). Adequacy estimates are available for D.C., but only for the highest-poverty quintile (as in Hawaii, we only have data for one school district in D.C.), and so D.C., while included in the state-by-state estimates presented below, is excluded from the figures presenting national averages in order to maintain the same group of states across district poverty categories. Finally, estimates for Vermont, though available from 2009 to 2016, are not available between 2017 and 2019 due to irregularities in that state's data (Vermont is therefore excluded from all years in Figure 10).

Figure 10

Trend in U.S. funding adequacy by district poverty

Average difference between actual spending and estimated spending required to achieve national average test scores, by district Census poverty quintile, 2009-19



NOTE:
Poverty quintiles defined state by state. Average differences weighed by enrollment, and do not include D.C., Hawaii and Vermont.

Source: School Finance Indicators Database

The national trend does offer some (cautiously) positive news. There was a substantial net decrease in the negative funding gaps for the high- and highest-poverty quintiles over this time period (the red and orange markers, respectively). Specifically, while the gap for both the high- and highest-poverty districts increased somewhat (about 5-6 points) between 2009 and 2013, both gaps shrank quite a bit between 2013 and 2019. In the highest-poverty districts, for example, the difference between actual and adequate funding levels went from roughly -29 percent in 2009 to about -17 percent in 2019, a change of +12 percentage points.

During this same time period, the *positive* gaps in the low- and lowest-poverty quintiles declined considerably (i.e., actual spending, on average, was closer to estimated adequate levels in 2019 than it was in 2009). Interestingly, whereas the bulk of the improvement in the higher-poverty quintiles occurred during the latter half of this time period (2013-19), most of the change for the lower-poverty quintiles, particularly the lowest-poverty group, occurred during the earlier half (2009-13).

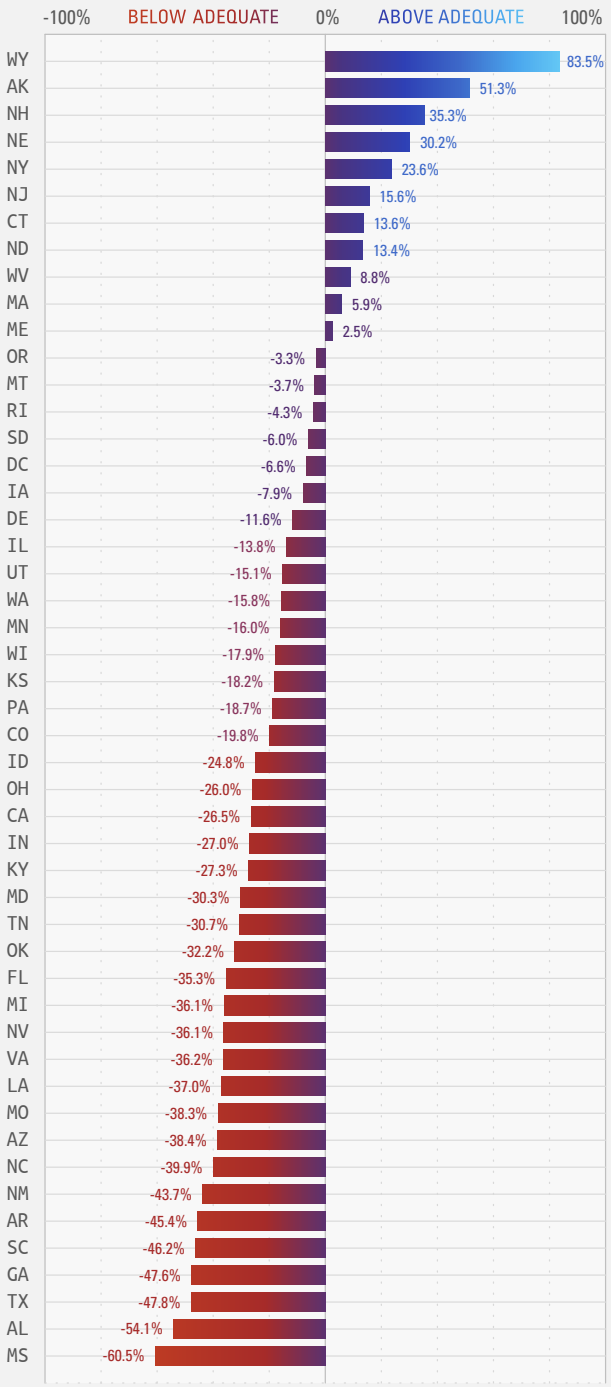
In general, then, the convergence of the lines in Figure 10 suggest that funding, while still below our adequacy targets in three of the five district poverty quintiles, did become more equitable—or, more accurately, less inequitable—between 2009 and 2019. Put differently, educational opportunity was less unequal in 2019 than in 2009.[7]

[7] It is worth mentioning that our selection for the NECM's "benchmark" goal—national average testing outcomes—constrains U.S. funding gaps across all districts to be roughly zero. This means, put simply, that any positive gaps in states or districts will generally be offset by negative gaps in other states or districts.

Figure 11

Funding adequacy in highest-poverty districts

Percent difference between actual spending and estimated spending required to achieve national average test scores, highest district poverty (Census) quintile, by state, 2019



NOTE:
Graph does not include Hawaii or Vermont (adequacy not available).

Source: School Finance Indicators Database

It is, however, important to bear in mind that, due to the availability of nationally normed testing data, our adequacy measures don't go back further than 2009. This means we cannot determine the extent to which the trend in Figure 10 represents a return to pre-recession levels versus an "actual" long-term improvement. It may, for example, be the case that the negative funding gaps in the high- and highest-poverty quintiles were even larger before the recession than they are in 2019. Were this the case, the trend in funding adequacy in these districts would be less improvement per se than making up lost ground.

Adequacy in states' highest-poverty districts

The U.S. averages, of course, mask substantial variation by state. Figure 11 presents the percentage difference between actual and estimated required spending for the highest-poverty districts in each state (this is the same measure as the rightmost bar in Figure 9, but presented for each state separately). For example, Wyoming spends 83.5 percent more than our estimate of the spending that would be required for students in its highest-poverty districts to achieve national average test scores. Alaska, similarly, spends 51.3 percent more than our targets (both of these states, as reiterated throughout this report, raise a large amount of revenue from natural resources such as oil and gas).

We focus this first state-level graph on the highest-poverty districts, rather than on the other four quintiles, because the former are the districts serving the students most in need of resources. To repeat, our measure defines adequacy in terms of a goal (national average test scores) that is common across student poverty levels. This may be a somewhat ambitious goal for higher-poverty districts in most states, and a very low bar for lower-poverty districts.

Moreover, our adequacy measure is not meant to imply that if a state or states raised their funding to meet target levels, test scores in that state would increase to the average in the short term. This is not only because our models are necessarily incomplete and imprecise (see Box 2), but also because the goal of getting students in higher-poverty districts in most states

to score at current national averages would require many years of sustained investment and improvement, and would likely be a multigenerational effort. The purpose of this measure, once again, is simply to evaluate adequacy, albeit imperfectly, based on a concrete reference point that is realistic and educationally meaningful.

That said, Figure 11 shows that, in addition to natural resource-rich Wyoming and Alaska, New Hampshire, Nebraska and New York all spend at least 20 percent above their predicted required amounts, even in their highest-poverty districts. These five states are among the 11 in Figure 11 that exhibit at least nominally adequate spending levels (i.e., the percentage difference between actual and required spending is positive). And there are another three states (Montana, Oregon and Rhode Island) within five percentage points of the estimated targets.

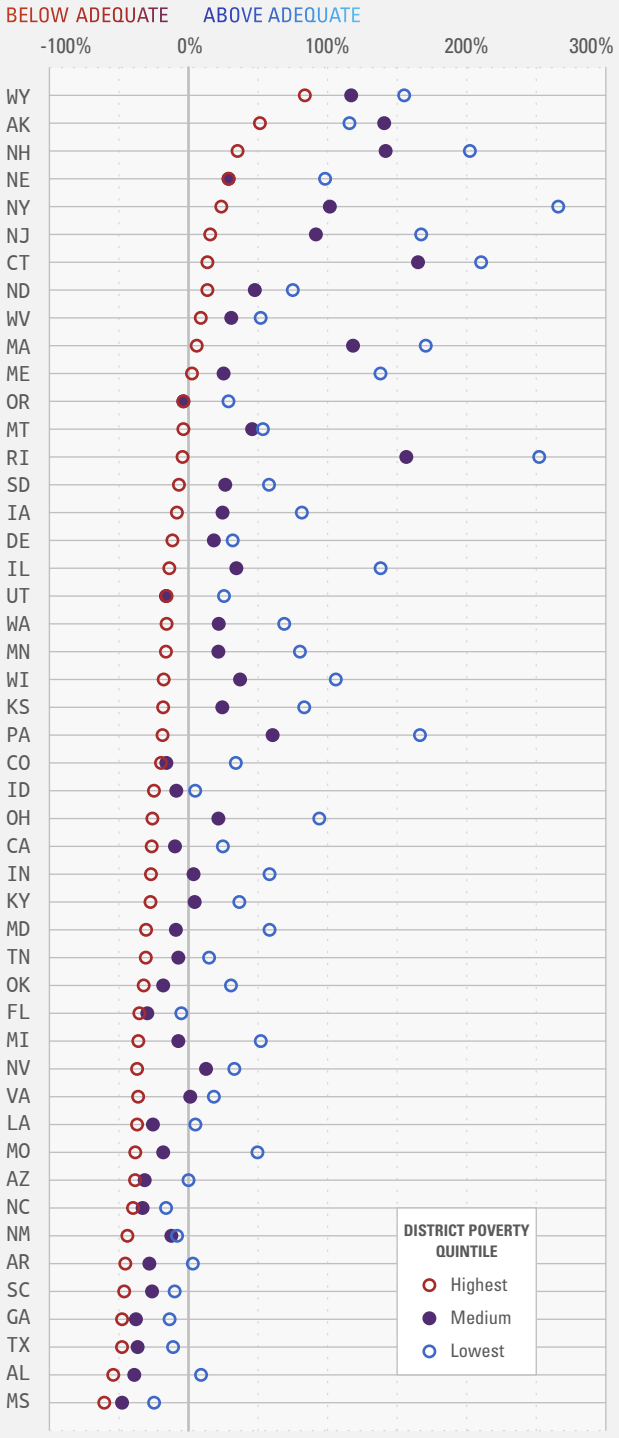
In the majority of states, however, actual spending falls well short of our estimated cost targets, including five states (Arkansas, Georgia, New Mexico, South Carolina and Texas) in which spending is between 40-50 percent lower than the targets, and two (Alabama and Mississippi) in which spending is at least 50 percent lower. In other words, in most states, the resources expended by the highest-poverty districts are well below what we estimate would be required for these students to perform at average testing levels; and in more than a few states, we find a chasmic gap between spending and costs.

The dot graph in Figure 12 presents the same statistic as does Figure 11 (percentage difference between actual and required spending), but, in addition to the gaps for the highest-poverty districts (hollow red circles), this figure also presents the gaps for the medium- (solid purple circles) and lowest-poverty districts (hollow blue circles) in each state. Estimates by state for all five poverty quintiles in 2019 are presented in Appendix Table A3, and state-level estimates by poverty quintile and over time (2009-19) can be viewed using the data visualizations at the SFID website (or downloaded as part of the full SID dataset).

Figure 12

Funding adequacy by district poverty

Percent difference between actual spending and estimated spending required to achieve national average test scores, highest-, medium- and lowest-poverty (Census) quintiles, by state, 2019



NOTE:
Graph does not include Hawaii or Vermont (adequacy not available). D.C. estimates only available for the highest-poverty quintile.

Source: School Finance Indicators Database

As would be expected from Figure 9, Figure 12 shows that spending is more adequate (or at least less inadequate) for the low- and medium-poverty quintiles than it is for the highest-poverty districts in virtually all states.

In fact, whereas there are only 11 states in which the highest-poverty districts receive adequate funding (Figure 11), Figure 12 shows the opposite situation in states' *lowest*-poverty districts: there are only eight states in which these relatively affluent districts, on average, receive funding *below* our estimated adequacy targets. In only one of these states (Mississippi) is the negative gap larger than 20 percent.

And the size of some of these positive gaps are striking. In 12 states' lowest-poverty districts, actual spending is at least 100 percent higher than (i.e., twice as high as) required spending. In four states (Connecticut, New Hampshire, New York and Rhode Island), the gap is greater than 200 percent.

Within each state, the size of the gaps between the three markers representing each poverty quintile merit some attention. There are, for example, a few states, such as Pennsylvania and Rhode Island, in which spending is below adequate in the highest-poverty districts but far above adequate in the middle- and lowest-poverty districts.

These types of discrepancies may be due in part to severe underfunding of high-poverty versus lower-poverty districts (see the next section on progressivity). They may also reflect, among other things, more pronounced differences in outcomes and/or costs (e.g., poverty rates) between the highest-poverty quintile and the others. In Rhode Island, for instance, actual spending declines moderately as district poverty increases (funding is regressive), but required spending levels increase dramatically between the medium-poverty quintile (around $6,700) and the highest-poverty quintile (about $17,000). This is in no small part because the average district poverty rate increases unusually steeply between the medium- and highest-poverty quintiles (particularly between the high- and highest-poverty quintiles), thus generating a large increase in estimated costs between quintiles (also potentially relevant here is how far above/below the national average are states' testing outcomes). As a result, we find a negative gap in the highest-poverty quintile right next to large positive gaps in the medium- and lowest-poverty quintiles.

In any case, Figure 12 also clearly indicates that even in those relatively few states where funding exceeds our estimated adequate levels for all poverty quintiles, educational opportunity as we define it (see Box 1) usually remains elusive, as the magnitude of the differences tend to vary drastically by poverty quintile (i.e., the lowest-poverty districts are far above the line and the highest-poverty districts often just barely above). This is not meant to minimize the fact that funding in these states, at least on average, is above our (modest) targets even in their highest-poverty districts, as this is a laudable (and far too uncommon) outcome. At the same time, however, any system in which funding is slightly above our targets in its highest-poverty districts and two or three times higher in its lowest-poverty districts is a long way from equitable.

Adequacy by student race and ethnicity

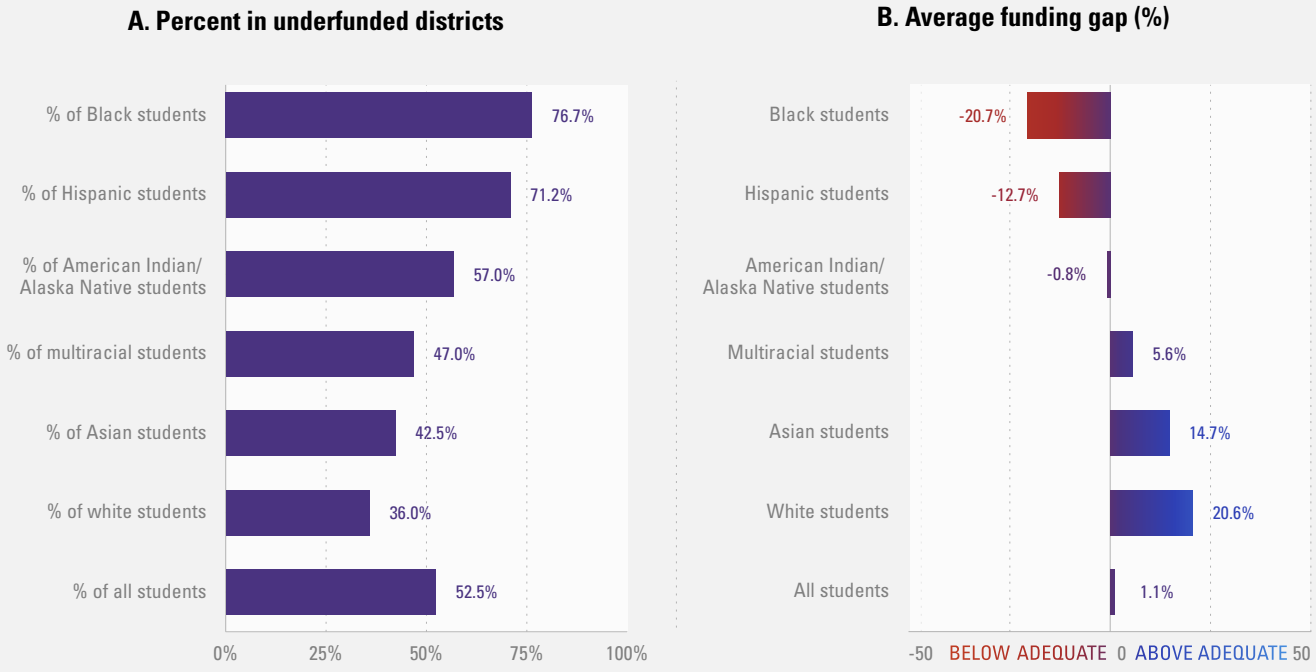
Given the association between income/poverty and race and ethnicity, it is not entirely surprising that we should find differences in funding adequacy by student race and ethnicity. That is, if students of color are overrepresented in lower-income districts, and lower-income districts tend to have both higher costs and lower funding than higher-income districts, then students of color will be more likely to attend schools in districts with below-adequate funding.

It is nonetheless important to examine these discrepancies, as doing so illustrates the multidimensionality of unequal educational opportunity in the United States, as well the intersection of school funding and racial/ethnic segregation, both present and past (Baker and Weber 2021). In addition, there is evidence that these race-/ethnicity-based funding gaps cannot be "explained away" by poverty (Baker et al. 2020).

Figure 13

U.S. funding adequacy by race and ethnicity

Percent of students in districts with below-adequate funding and average gap between actual and estimated adequate spending, by student race and ethnicity, 2019



NOTE:
Estimates do not include Hawaii or Vermont (adequacy not available).

Source: School Finance Indicators Database

(Note: We will use the terms "American Indian," "Black" and "Hispanic" because these are the categories used by the National Center for Education Statistics, the source of our district race and ethnicity composition data.)

In panel A of Figure 13, we present the percent of students attending districts with funding below estimated adequate levels in 2019 by student race and ethnicity.[8] We find that 36 percent of white students attend districts with negative gaps, compared with 77 percent of Black students and 71 percent of Hispanic students.[9] In other words, Black and Hispanic students are about twice as likely as their white peers to attend school in a district with below-adequate funding.

The proportion of Asian students in districts that spend below our cost targets (about 43 percent) is not as low as that for white students, but is still comparatively low. Finally, the estimate for American Indian/Alaska Native students, who constitute about 1 percent of U.S. public school students nationally, is 57 percent, and the estimate for students reporting "two or more races" (i.e., "multiracial") is 47 percent.

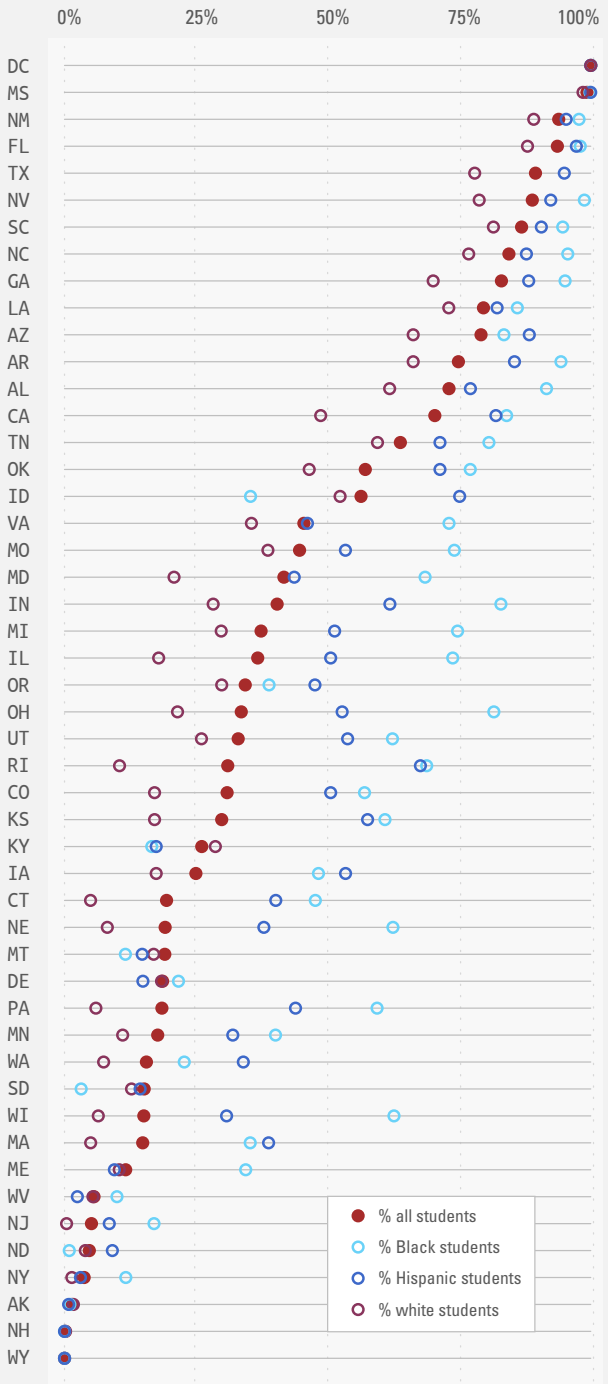
[8] The estimates presented in Figures 13 and 14 are calculated using the SFID's District Cost Database, and aggregated to the state level. The DCD includes NECM-derived adequacy estimates for over 12,000 individual school districts (see Baker et al. 2021). Like the SID, the DCD is freely available to the public at the SFID project website, currently for 2018 only; the 2019 data presented in this report, as well as estimates going back to 2009, will be released in early 2022.

[9] We do not report results separately for Hawaiian Native/Pacific Islander students, as roughly one-fourth of these students are in Hawaii, for which adequacy estimates are not available.

Figure 14

Percent of students in underfunded districts, by race and ethnicity

Percent of students by race and ethnicity attending districts with below-adequate funding, by state, 2019



NOTE:
Graph does not include Hawaii or Vermont (adequacy not available).

Source: School Finance Indicators Database

Whereas panel A of Figure 13 presents the proportion of students in each subgroup attending districts with negative gaps (of any size), panel B indicates the size of those gaps (i.e., the percentage difference between actual and required spending) for the typical student of each race/ethnicity (including those attending districts with funding above our cost targets).

The panel shows that the typical Black student attends a district in which funding is roughly 21 percent below adequate, the average gap for Hispanic students is about -13 percent, and the difference for American Indian/Alaska Native students is 1 percent below adequate. In contrast, the average white student's district spends 21 percent above our adequate targets, and the average Asian student's district spends 15 percent above our adequate targets.

Figure 14 presents the percent of students (by race and ethnicity) in underfunded districts by state. This is the same statistic as is presented in panel A of Figure 13, but in Figure 14 it is calculated state by state. We limit this graph to white, Black and Hispanic students because the share of students in the other groups is extremely low in the majority of states. In addition, generating this graph using percentage gaps (panel B) instead of percent underfunded leads to similar conclusions. Finally, note that the three percentages for D.C. are all 100 percent, as the state consists of a single government-run district.

In 41 out of 49 states with available adequacy estimates, the percent of both Black and Hispanic students in underfunded districts are higher than the corresponding percent of white students. In seven states, the difference between the Black and white percentages is greater than 50 points. For instance, 21 percent of Ohio's white students attend districts with below-adequate funding, compared with 82 percent of Black students.

Moreover, the handful of states in which a larger share of white students attend underfunded districts than do their Black and Hispanic peers tend to be those with relatively small shares of Black and/or Hispanic

students. For example, six of the seven states where a larger share of white students than Black students attend underfunded schools are Alaska, Idaho, Montana, New Hampshire, North Dakota and South Dakota, all of which serve very small proportions of Black students.

Even in states where the percentage of all students in underfunded districts is relatively low, the proportion of Black and Hispanic students attending districts with below-adequate funding is often substantially higher. In Pennsylvania, for instance, only 19 percent of students (and 6 percent of white students) attend underfunded districts, compared with 59 percent of Black students and 44 percent of Hispanic students. Similarly, in Massachusetts, where funding is above adequate even in the highest-poverty districts (Figure 10), and only 15 percent of all students are in underfunded districts, 35 percent of Black students and 39 percent of Hispanic students attend schools in district with spending levels below our adequacy targets.

These race- and ethnicity-based discrepancies in funding adequacy, like those based on district poverty, reflect the failure of most states to provide equal educational opportunity for their students regardless of their backgrounds or circumstances. And this is particularly salient given that not a single state includes race and ethnicity as a factor in the allocation of K-12 revenue.

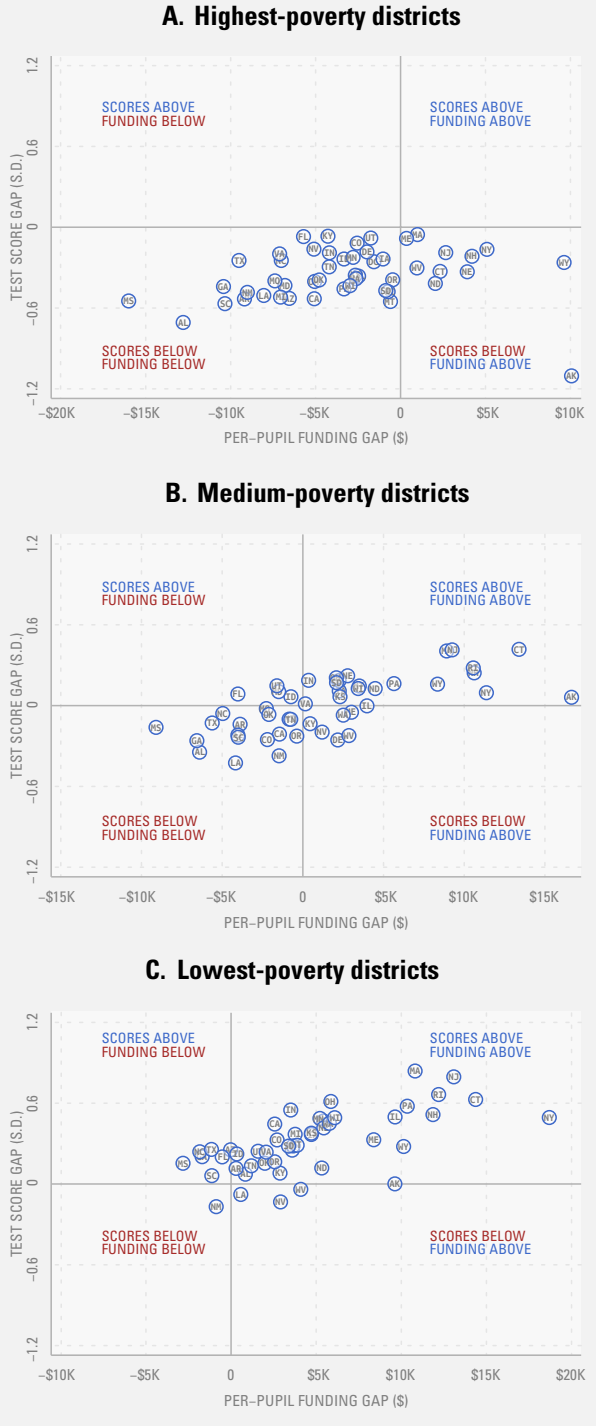
Funding gaps by testing outcome gaps

The adequacy gaps discussed above are not abstract statistics; they have serious implications for student performance. When interpreting the relationship between our adequacy measures and testing performance, it is important to remember that adequacy gaps are based in part on testing outcome gaps that also vary by state. It follows, then, that even states that spend relatively high amounts on education might still have to spend even more to achieve average test scores than states that spend less, if the testing outcomes in the former states are further below the national average. Put differently, adequate spending levels in one state may not be adequate in another state—spending adequacy as we define it is a relative concept.

Figure 15

Funding gaps by test score gaps

Scatterplot of gap between state and national average test scores (in standard deviations) and gap between actual and estimated required spending per-pupil ($), by district Census poverty quintile, 2019



NOTE:
Plots do not include Hawaii or Vermont (adequacy not available).

Source: School Finance Indicators Database

To get a better sense of the actual "distances" involved here, we take a look at the relationship between spending gaps and testing outcome gaps in Figure 15.[10] We will once again focus on the highest-poverty, medium-poverty and lowest-poverty quintiles in each state.

Instead of expressing gaps between actual and required spending as a percentage, the scatterplots present these gaps in U.S. dollars per pupil (on the horizontal axis). On the vertical axis in each plot is the outcome gap—that is, the gap in average test scores, expressed in standard deviations, between the students in each poverty quintile and the national average for all students. The intersecting lines within the plots represent zero gaps (in testing outcomes and spending). Note that the value of the x-axes differ between the three scatterplots (though the total amount contained within the axes is the same).

As would be expected, the dots in all three graphs exhibit a general upward sloping pattern, indicating a positive relationship between funding gaps and outcome gaps. That is, states that spend more than required tend to achieve higher test scores relative to the national average.

Consequently, the majority of states in all three scatterplots fall into either: (1) the bottom-left quadrant formed by the blue lines (spending below estimated targets and test scores below the national average); or (2) the upper-right quadrant (spending above targets and test scores above the average). In the scatterplot containing results for the highest-poverty districts (the plot on top), most states are in the former quadrant. In the lowest-poverty scatterplot (the bottom plot), most states are in the latter quadrant. And in the middle-poverty scatterplot, there is a roughly equal split.

This indicates that most states provide sufficient resources to their lowest-poverty districts (as was also suggested by Figures 9 and 12), and they achieve above-average outcomes. The opposite is true, however, of the highest-poverty districts: They are underfunded vis-à-vis estimated requirements, and their students perform accordingly. For instance, Massachusetts and Maine spend near or above estimated requirements in their highest-poverty districts (the top plot), and they both achieve near or above-average outcomes. At the other end of the spectrum, Alabama and Mississippi spend much less than required and exhibit accordingly low outcomes.

There are, however, exceptions to this pattern of adequate spending/outcomes in the lowest-poverty districts and inadequate spending/outcomes in the highest-poverty districts. New Mexico spends so little on its lowest-poverty districts (in part due to low capacity) that students in these relatively affluent districts do not even achieve national average test scores. Spending in South Carolina's lowest-poverty districts is also below the target, and students in these districts barely score above the national average.

Conversely, in New York's lowest-poverty districts, funding is far above the estimated requirement, but testing outcomes are somewhat lower than would be expected from the overall pattern of the dots. This may be due in part to the fact that many suburban New York districts (e.g., those in Westchester County or on Long Island) with relatively low-needs student populations spend exorbitantly, but do not achieve testing outcomes commensurate with this spending (a possible "ceiling effect").

Similarly, Alaska's lowest-poverty districts also spend well above the predicted requirements but still have test scores at roughly the national average (testing outcomes are well below what we would expect in the other quintiles as well). This may be attributed in part to the uniqueness of Alaska, where transportation, facilities and other basic needs not accounted for by the variables available to researchers cost far more than they do in other states. As a result, spending is higher but outcomes are not.

[10] The testing gaps presented in Figure 15 are actually 2018 gaps, as this is the final year of data available in the Stanford Education Data Archive, the source of our nationally normed testing outcome data.

Overall, incongruities between the adequacy of spending in a state and its testing outcomes—high-spending states with lower-than-expected testing outcomes, or vice versa—may also be due in part to inefficiency in various forms, whether state-specific (e.g., Alaska's uniqueness) or simply because districts in some states may receive above-adequate funding but are not spending the money in a manner that improves testing outcomes (or, conversely, some may receive below-adequate funding but spend it more effectively). But an additional possible culprit here is the fact that our federal spending data, our nationally normed testing data and our models are all subject to imprecision (see Box 2).

That said, Figure 15 demonstrates that adequate spending is generally if not perfectly associated with better student outcomes. It follows, then, that the tendency of most states to spend below our (modest) cost targets in their higher-poverty districts carries implications for the educational outcomes among students served by these districts, and for the equality of educational opportunity in the United States.

The relationship between adequacy and effort

The causes of inadequate (or adequate) funding vary among states, but in no small part they depend on whether states devote enough of their resources to meet their students' needs—that is, it is about effort.

As discussed above, just as districts vary in their ability to pay for schools with local revenue, so too do states differ in the sizes of their "economic pies" from which they can generate funds. There are, for example, states that lack the capacity to raise the revenue necessary to meet their students' needs (and, not coincidentally, many of these states also serve larger shares of high-needs students). But there are also inadequately funded states in which lawmakers have the option to raise sufficient (or at least more) revenue but refuse to do so, effectively tolerating poor student outcomes. And there are far more of the latter states than the former.

We might illustrate this important distinction first by looking quickly at the bivariate relationship between adequacy and fiscal effort. Recall that effort measures how much of a state's economic capacity (e.g., its GSP) goes toward K-12 education.

Figure 16 presents a scatterplot of the relationship between our GSP-based effort indicator (from Figure 3) and the adequacy of spending on states' highest-poverty districts (from Figure 11). Adequacy is presented in terms of the percentage difference between actual and required spending, with values above zero indicating adequate spending and values below zero indicating spending below our estimated adequacy targets. Each blue circle is a state, and the red dashed line represents the average relationship ("best fit") between these two variables.

The scatterplot indicates a positive relationship between effort and adequacy—i.e., the red dashed line and the blue circles representing states tend to slope upward. States that put forth higher effort tend to spend more adequately on their highest-poverty districts, and vice versa, though the relationship is of moderate strength (the correlation between the two variables is 0.39). As we'll see, however, that statistical "noise" carries important policy conclusions.

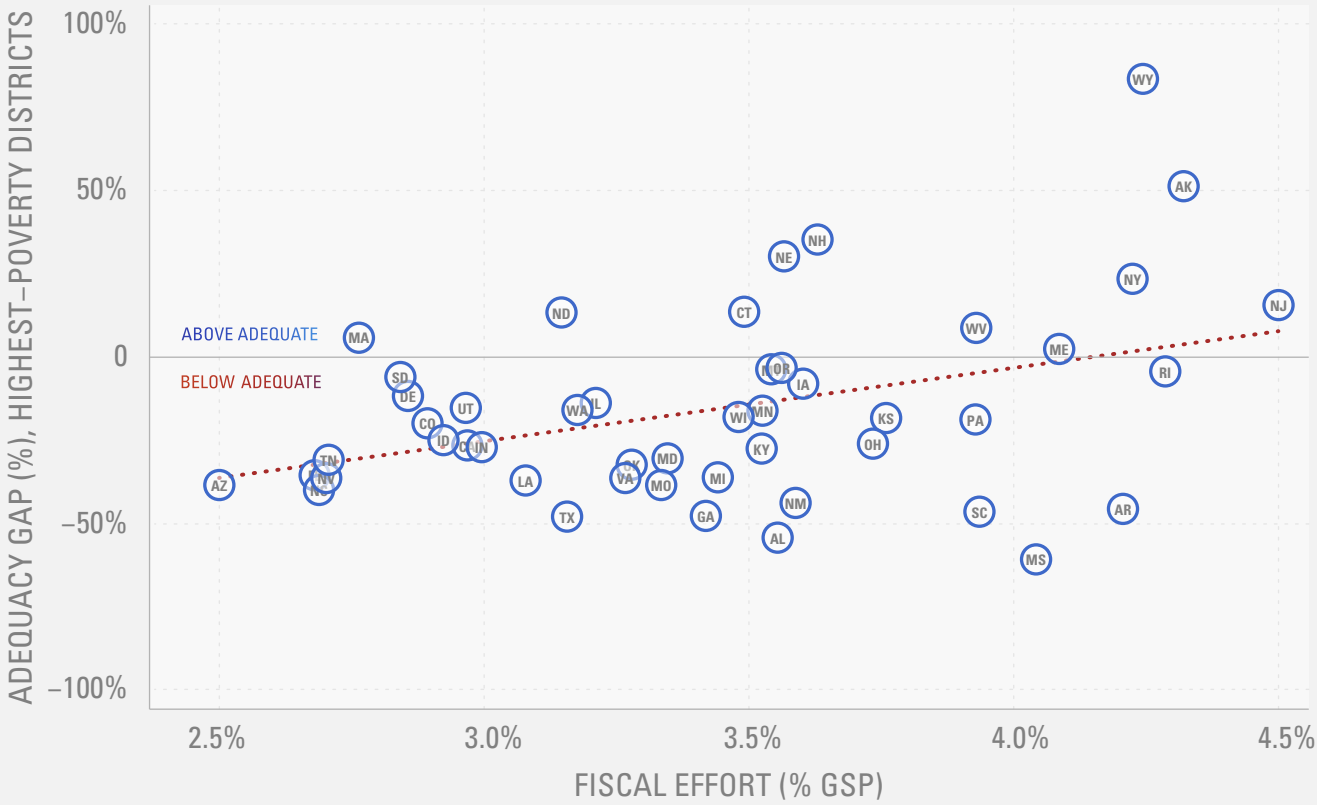
One area of the figure that merits attention is the lower left part of the plot, where both adequacy and effort are low. Arizona, for example, has one of the largest negative gaps of all states in its highest-poverty districts (spending is 38 percent below our cost targets) and has the second lowest effort of any state (2.59 percent). Other states, including Florida, Nevada, North Carolina and Tennessee, also spend inadequately and put forth relatively low effort levels.

In contrast, the upper-right area of the plot includes states such as New York, Alaska and especially Wyoming, all of which put forth above average effort and are among the relatively few states that fund their highest-poverty districts at adequate or near-adequate levels. This shows, in general, that states willing to put forth the effort to fund their schools adequately tend to accomplish this goal (and, as suggested by Figure 15, also tend to achieve better testing results).

Figure 16

Adequacy by fiscal effort

Scatterplot of percent difference between actual and estimated required spending in highest (Census) poverty districts and state fiscal effort (direct spending as a percent of gross state product), 2019



NOTE:
Plot does not include Hawaii or Vermont (adequacy not available).

Source: School Finance Indicators Database

Of particular concern, however, are the exceptions to this tendency—i.e., states that exhibit strong fiscal effort but still fall short of adequate spending levels (the lower-right area in Figure 16). These states are partially "responsible" for the modesty of the correlation depicted in Figure 16.

For instance, states such as Arkansas, Mississippi and South Carolina are devoting relatively large (or at least above-average) shares of their economies to schools, but are still failing to fund them anywhere near our adequacy targets. This, to reiterate, is in part because students in these states' highest-poverty districts are especially higher in poverty compared with students in other states' highest-poverty districts (remember that district poverty quintiles are defined state by state). States such as Arkansas and Mississippi have higher costs, and must therefore spend more to achieve the common goal of national average test scores.

But it is also because of the (related) fact that these are comparatively low-capacity states (see Figure 4). That is, their high effort levels still generate less revenue than those levels would yield in states with larger economies (e.g., 4 percent generates a lot more revenue in a high-GSP state than in a low-GSP state). In other words, these are the states that are "trying" to fund their districts properly, but simply lack the capacity to do so. Federal assistance might be targeted at these states, many of which have small economies that constrain their ability to raise sufficient revenue even in good economic times.

Conversely, states with inadequate spending and *low* effort levels should be encouraged to boost their effort (e.g., via taxation), perhaps as a condition of receiving some forms of federal assistance (see Baker and Di Carlo 2020). These are states in which inadequate spending, and the poor outcomes that usually accompany it, represent, at least in part, a deliberate choice on the part of policymakers to tolerate poor outcomes despite having the capacity to improve them.

States' negative funding gaps and declining fiscal effort

The sum of all negative (i.e., inadequate) funding gaps in the United States, ignoring all positive gaps, is roughly $105 billion. That is equivalent to approximately 17 percent of total current spending in the more than 12,000 districts across 49 states and D.C. for which we have adequacy estimates in 2019. In other words, it would cost $105 billion to bring every single one of these inadequately funded districts up to our (admittedly modest) estimated target funding levels, without taking any funding away from districts where spending exceeds estimated costs (adequacy without equal opportunity).

This is a tremendous figure. It may even sound like an impossible gap to bridge.

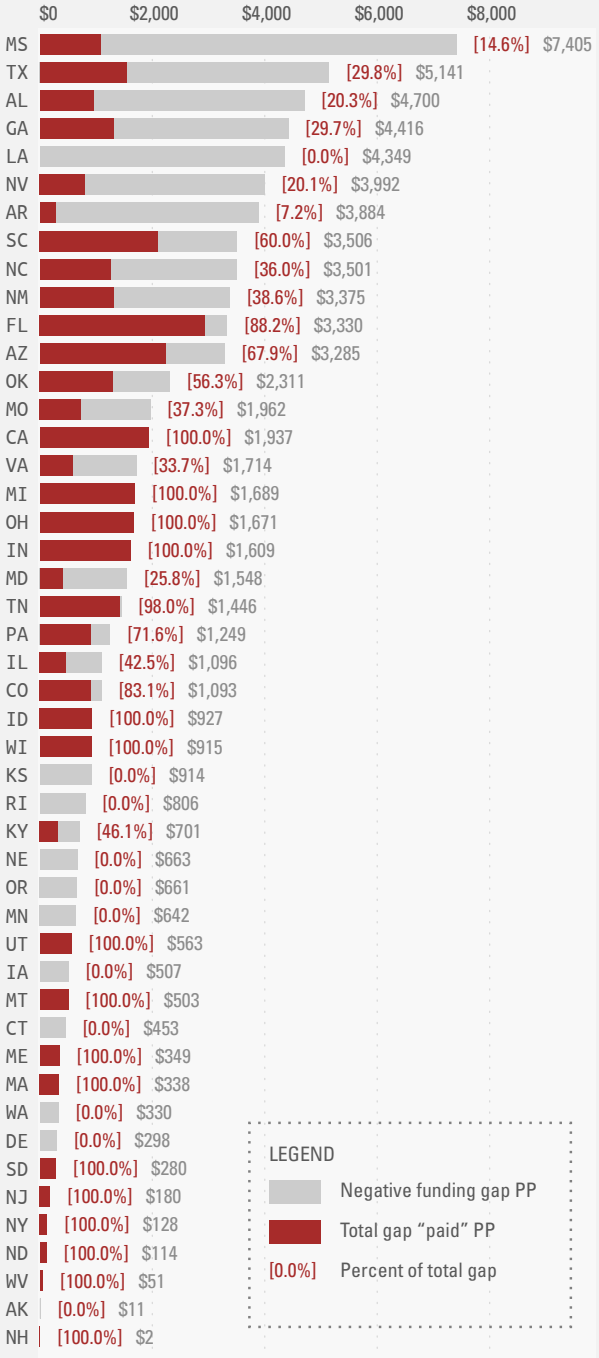
In Figure 6, we showed how much additional funding each state would have in 2019—or, in a dozen cases, how much less—had all states recovered to their pre-recession (2004-07) effort levels. We might now compare these amounts to states' negative funding gaps. Put differently, how much of each state's 2019 negative funding gap—the additional funding it would need to bring all its districts up to our estimated adequate spending levels without inter-district transfers—might hypothetically be "paid off" by a restoration of its effort levels from 15 years earlier?

In Figure 17, the total length of the bars for each state represent that state's total negative funding gap per pupil (dividing the gaps by enrollment allows for a more intuitive comparison of the gaps with simulated spending across states, but expressing these data differently does not change the conclusions).

Figure 17

Comparison of negative funding gaps and additional 2019 revenue under 2004-07 effort levels

Additional per-pupil funding generated by "simulated" 2019 spending based on average 2004-07 fiscal effort levels as a proportion of total 2019 negative funding gap per pupil, by state, 2019



NOTE:
See text for details on calculations. Graph does not include Hawaii and Vermont (adequacy estimates not available), D.C. (effort not available) or Wyoming (no negative funding gaps).

Source: School Finance Indicators Database

The red area within each bar represents the proportion of that gap that could hypothetically be "paid" by the additional 2019 funding each state would have under its average effort level between 2004-07 (the actual percentages are presented next to each bar in red type, enclosed in brackets).

Figure 17 does not include Vermont and D.C. (effort not available in 2019), Hawaii (adequacy estimates not available) and Wyoming, the only state in which actual funding for every district exceeds estimated adequate levels in 2019 (i.e., the state has no negative gaps).

There are 11 states in Figure 17 without any red in their bars (and values of 0.00% in brackets). These, of course, are the 11 states (minus Wyoming) in which average effort between 2004-07 was lower than it was in 2019, and so there is no hypothetical "additional funding" to close the gaps (see Figure 6). Notice, however, that the size of the gaps in all but one of these states (Louisiana) are generally small. Together, these 11 states are responsible for only about 5 percent of the nation's total funding gaps.

But in the 36 states where there *would* be additional (simulated) 2019 funding from restoring 2004-07 effort levels, the amount of that additional funding is in many cases quite substantial relative to the size of total negative funding gaps. There are, somewhat remarkably, 16 states in which 2004-07 effort levels would generate funding sufficient to completely pay all negative gaps in those states (the bars in these states are entirely red). In other words, there are 16 states in which every single student could (hypothetically) attend a district with above-adequate funding were those states simply to return to their effort levels from 15 years ago. And, in one additional state (Tennessee), the additional funding is equivalent to 98 percent of the total negative gap.

(Note, of course, that the illustrative additional funding in all 16 states actually exceeds its total negative funding gap, in several cases by quite a lot. In these states, the additional funding could not only eliminate negative gaps, but establish positive gaps as well.)

Predictably, many of these 16 "fully paid" states have relatively small funding gaps to fill (their bars are relatively short). But the list also includes several states with rather large gaps. Indiana, Michigan and Ohio, for instance, all have negative funding gaps equivalent to over $1,500 per pupil, and their 2004-07 effort levels would generate enough funding to pay them off completely (and more). Similarly, California's per-pupil gap, the 15th largest in the United States, is also lower than its additional simulated funding. Were California to restore its 2004-07 effort levels, every single student in the nation's largest state—nearly 17 percent of the nation's students attending underfunded districts in 2019—could potentially attend schools in districts with adequate funding.

In an additional seven states, 2004-07 effort levels would close gaps by more than 50 percent, including, once again, a few states with large gaps, such as Arizona, Florida and South Carolina. Even in states such as Mississippi, Nevada and Alabama, where gaps are enormous and capacity is low, the difference between 2004-07 and 2019 effort levels is equivalent to between 10-20 percent of the gaps.

Across all these states, including those where gaps would be unaffected (i.e., the 2019 effort is higher than it was pre-recession), the restoration of average 2004-07 effort levels would reduce the total U.S. negative funding gap by 51 percent. And half of the remaining gap would be in just two states, Texas and Georgia.

Now, needless to say, this is just an illustration rather than an actual policy simulation. It is not only purely hypothetical—simulating effort levels from the past in 2019—but it is also assuming that the additional funding generated by the restoration of previous effort levels would be targeted exclusively at districts with negative funding gaps.

That said, what Figure 17 does show is that most states could make at least a meaningful dent in their funding gaps—and many could make rather large dents—not by elevating their effort to unprecedented levels, but

simply by devoting the same share of their capacity to schools as they did before the 2007-09 recession. This suggests that adequate funding for all students, at least by our modest goal of national average testing outcomes, is not necessarily some fantasy that would require unprecedented increases in state and local tax revenue relative to capacity. These effort levels were in place just 15 years ago.

PROGRESSIVITY

A progressive school finance system is one in which districts serving larger shares of high-needs students (e.g., students from low-income family backgrounds), all else equal, are provided greater resources than their counterparts serving smaller shares of high-needs students.

As an example: The highest-poverty districts in a state may receive 25 percent more revenue than the lowest-poverty districts, while in another state, the highest-poverty districts may only receive 5 percent more revenue. We would say, then, that the first state is more progressive than the second state. Finally, a state in which the highest-poverty districts actually receive less revenue than the lowest-poverty districts would be characterized as regressive, while a state in which high- and low-poverty districts receive similar amounts would be called "non-progressive" or a "flat-funding state."

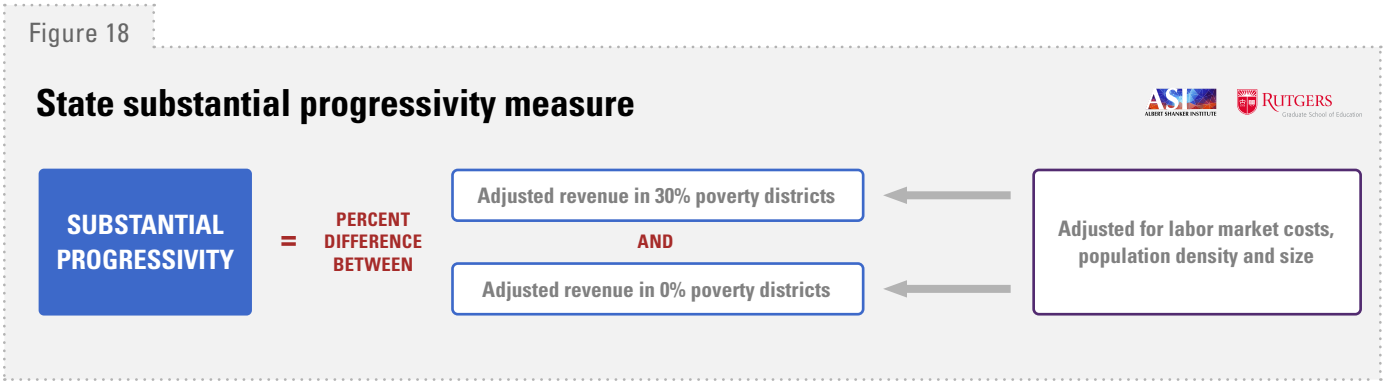
Progressivity of inputs is important in light of the consensus that districts serving larger shares of high-needs children require more resources than their counterparts serving smaller shares to provide the same level of education service. Regressive allocation of revenue drives regressive spending, which in turn drives regressivity of education inputs such as staffing ratios and class sizes. Moreover, even when funding is inadequate to meet a given outcome goal, states can still preserve equal opportunity by ensuring that funding is no less adequate (or more inadequate) for some groups of students than for others (see Box 1). To do so, states must direct more resources to higher-needs (i.e., higher-poverty) districts than to lower-needs districts.

In the most general terms, states can achieve progressive funding by calibrating their systems such that the distribution of state aid compensates for differences in local capacity to raise revenue (e.g., via property taxes). Most states' systems are in fact set up to do this, at least in theory, but their results, as we'll see, vary in practice.

The primary measure of states' progressivity in this report ("substantial progressivity") is the comparison of state and local revenue between high-poverty districts (30 percent Census child poverty) and districts with 0 percent poverty.[11] In other words, we statistically "predict" revenue in each state at two different district poverty levels: a high-poverty district (30 percent) and the lowest-poverty (0 percent) district. These are not two "real" districts per se but rather estimates of revenue at two points in the district poverty distribution based on the average relationship between poverty and revenue in a given state. Note also that this definition of "high-poverty" districts is different from that used in our adequacy measure (in which districts are sorted by poverty into quintiles).

[11] The SID also includes an alternative fairness measure, "systematic progressivity," which is the correlation between district state and local revenue and district poverty (both labor market-centered) within each state (for a given year). Whereas substantial progressivity gauges the size of differences in resources between high- and low-poverty districts, systematic progressivity measures the consistency of the relationship between district poverty and district revenue. We focus here on the former because it provides a more intuitive sense of the differences in resources among districts with different poverty levels (the two variables are quite strongly correlated).

Figure 18



As discussed above (see Figure 1), these revenue figures are also statistically "adjusted" for district size, labor market costs and population density, which basically means that our estimates compare high- and zero-poverty districts in each state that are also similar in terms of these other factors, all of which affect the value of the education dollar. By controlling for these variables, and comparing predicted revenue between equivalent district poverty levels within each state, our estimates allow for better comparisons of progressivity within and between states.[12]

Progressivity by state in 2019

The map in Figure 19 presents the percentage difference in adjusted state and local revenue between high- and zero-poverty districts, by state. Estimates greater than zero indicate progressive funding (high-poverty districts receive more than zero-poverty districts), whereas those less than zero indicate regressivity. Progressivity estimates are not available for Hawaii and D.C., as both contain only one public school district run by a government entity that reports finance data to the U.S. Census Bureau (thus precluding the comparison of adjusted revenue at different district poverty levels).

For instance, the estimate for Nevada is -35.1 percent, which means that Nevada's high (30 percent) poverty districts receive about 35 percent less revenue than otherwise similar districts with zero-poverty rates. That is, funding in Nevada is regressive, and extremely so. We also find substantial revenue regressivity in Delaware (-32.6), New Hampshire (-25.1 percent), Pennsylvania (-22.4) and Illinois (-21.7).

Conversely, 27 of the 49 states in Figure 19 exhibit at least nominal progressivity, although, in a couple of cases, namely Wisconsin and Arizona, the percentages are so close to zero that they might be more accurately described as non-progressive (i.e., neither progressive nor regressive, or "flat-funding states," which, based on our standard of +/-3 percent, are shaded in purple).

Funding is highly progressive in Utah (+64.0 percent), Wyoming (+65.9) and especially Alaska, where adjusted revenue for higher-poverty districts is almost 150 percent higher than it is for districts at 0 percent poverty (progressivity in both Alaska and Wyoming can fluctuate dramatically from year to year due to their reliance on revenue from natural resources).

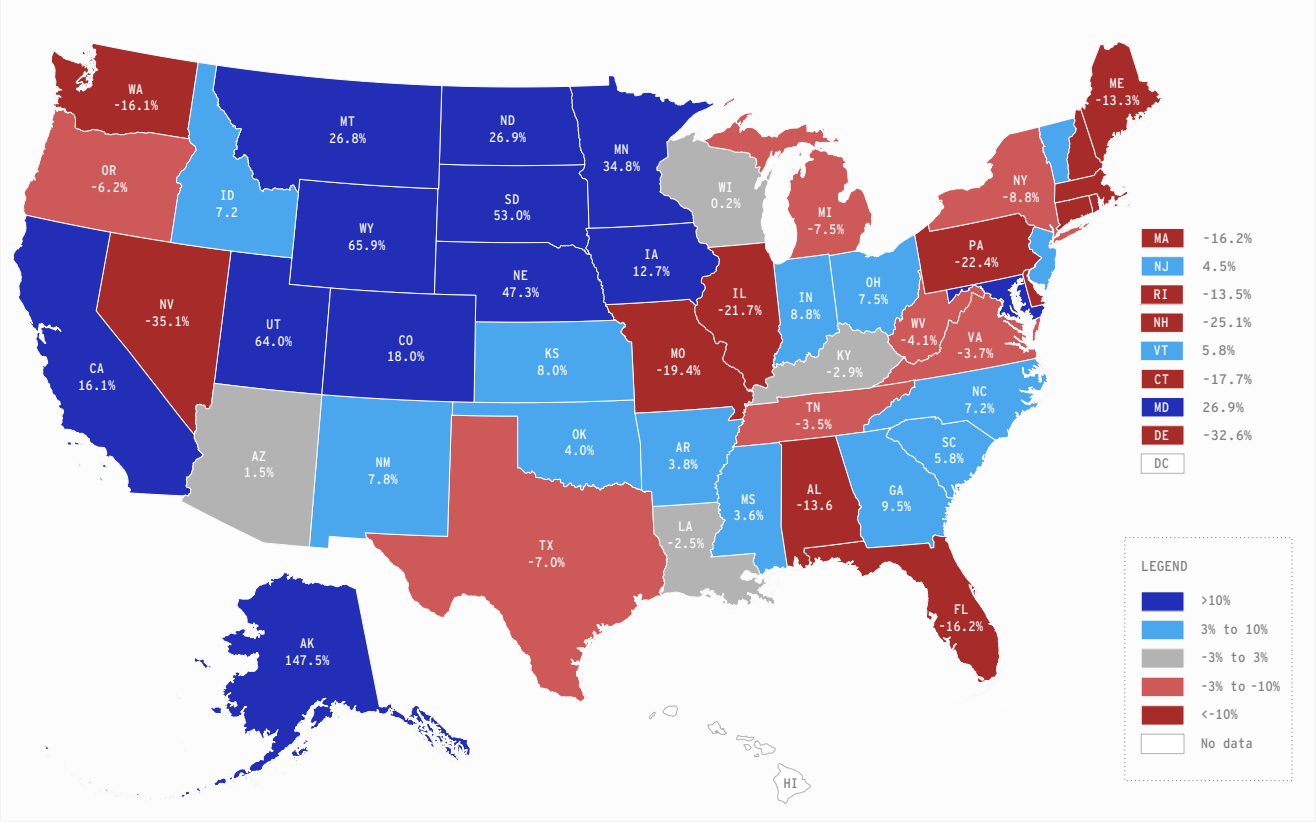
In general, though, the key observation in Figure 19 is the small number of states with "meaningfully" progressive funding systems. For instance, in the 27 states with at least nominally progressive funding (estimates greater than zero), the difference is greater than 10 percent in only 12 states (i.e., states shaded in light blue). From this perspective, one can argue that the majority of states' funding systems are either regressive, non-progressive or, at best, only modestly progressive.

[12] Also included in our SID are variables for adjusted per-pupil funding at different poverty levels (0, 10, 20 and 30 percent), as well as progressivity measures based on these variables, not only for state and local revenue, but also for revenue by source (federal, state and local), current spending and resource allocation measures such as teacher-student ratios.

Figure 19

Progressivity of state education funding

Percent difference in adjusted state and local revenue between high Census poverty (30 percent) and zero-poverty districts, by state, 2019



NOTE:
Map does not include Hawaii and D.C. (progressivity not available).

Source: School Finance Indicators Database

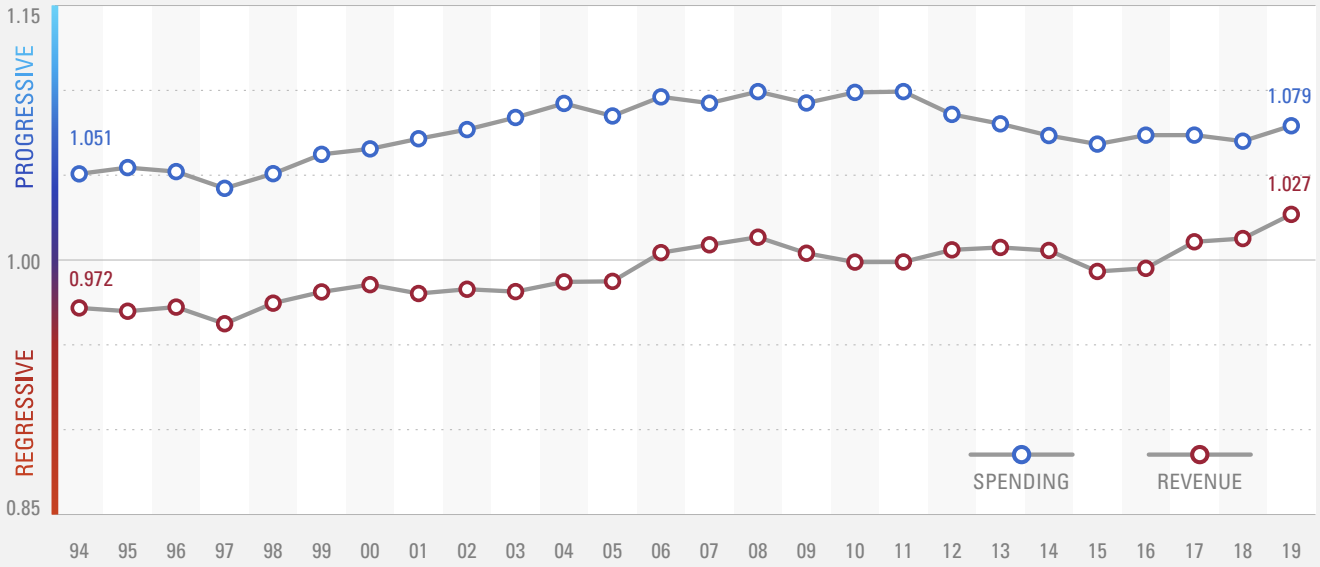
This failure on the part of most states to allocate K-12 funds in a truly progressive manner most certainly contributes to the finding, discussed above and presented in Figure 12, that spending tends to be above estimated adequate levels in states' lower-poverty districts and below adequate levels, often far below, in their higher-poverty districts. In other words, non-progressive distribution of resources is a major cause of unequal educational opportunity.

Most states, in fact, currently spend enough overall to eliminate all of their negative funding gaps (i.e., total actual spending exceeds total required spending). And this includes states, such as Pennsylvania, Illinois, Rhode Island, Washington and several others, that spend well below our cost targets in their highest-poverty districts. They fall short of uniformly adequate spending (and equal opportunity) because they allocate resources regressively.

Figure 20

Trend in U.S. progressivity

Ratio of average (labor market-centered) state and local K-12 revenue and current spending in highest-poverty districts to revenue and spending in lowest-poverty districts, 1994-2019.



NOTE:
Revenue and spending centered around the average of each district's labor market. Poverty quintiles defined state by state. Averages weighted by enrollment. Estimates do not include Hawaii or D.C.

Source: School Finance Indicators Database

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U.S. progressivity trend, 1994-2019

Although our estimates are best viewed and interpreted at the state level, it is useful to get a national sense of the fairness of U.S. education funding, and how it has changed over time. In Figure 20, we present the trend in national average progressivity between 1994 and 2019. This graph presents not only state and local revenue, but current spending as well. Spending is generally a bit more progressive than state and local revenue, in part because the former includes federal funds, which are more targeted at districts serving larger proportions of higher-needs students (e.g., Title I aid).

To control roughly for contextual differences, we take a somewhat different approach when calculating national averages than we do for the state-by-state estimates in Figure 19. Namely, for Figure 20, we divide revenue (and spending) in each district by the average revenue (and spending) in that district's labor market (i.e., revenue and spending are "centered" around the labor market mean).

We then calculate the U.S. average of "centered" revenue and spending for each poverty quintile nationally, and divide the average for the highest-poverty quintile by that for the lowest-poverty quintile. Poverty quintiles are still defined state by state, so this graph requires cautious interpretation, but it provides an approximate idea of the national picture when it comes to progressivity, and of trends therein. Once again, these calculations do not include Hawaii or D.C.

Ratios greater than one in Figure 20 indicate progressive funding (the highest-poverty districts receive more funding than the lowest-poverty districts), whereas values less than one represent regressive funding (the highest-poverty districts receive less funding). Note that the vertical axis begins at 0.85 (funding in the highest-poverty districts is 15 percent below that in the lowest-poverty districts) and ends at 1.15 (funding in the highest-poverty districts is 15 percent above that in the lowest-poverty districts), and so year-to-year changes in the graph may appear larger or smaller than they would with different axis scaling.

Focusing first on the ratio in the most recent year (2019), we find that revenue (the line with red markers) in the highest-poverty districts is approximately 2.7 percent higher than it is in the lowest-poverty districts. This difference is very small and can be realistically interpreted as neither progressive nor regressive. That is consistent with the state-by-state estimates in Figure 19. Spending (the line with blue markers) is a bit more progressive, but only moderately so, with the highest-poverty districts spending roughly eight (7.9) percent more than the lowest-poverty districts.

The distribution of resources is a state-level policy decision, and national averages represent the results of 50 separate systems. That said, all else being equal, the highest- and lowest-poverty districts receive roughly the same funding, on average, and the former spend only moderately more than the latter.

We can now discuss quickly how this national situation has changed over time, with a particular focus on revenue (the red line). In Figure 20 there is a steady, albeit rather modest, increase in revenue progressivity up until 2008 (the 2007-09 recession began in the middle of this school/fiscal year), followed by a bumpy net decline until 2016 (notice there is also a comparatively small decrease in revenue progressivity coinciding with the recession of the early 2000s).

Specifically, during the decade before the crash in late 2007, revenue went from a minimally regressive 0.972 in 1994 (i.e., revenue in the highest-poverty districts was about 2.8 percent [1-0.972] lower than that in the lowest-poverty districts) to a minimally progressive 1.013 in 2008 (revenue was 1.3 percent higher in the highest-poverty districts). This was followed by a net decrease between 2008 and 2011, particularly between 2008 and 2009, and then some volatility in the trend, arriving at almost exactly 1.00 in 2014-16 (no difference between highest- and lowest-poverty districts). Finally, there is a net uptick between 2016 and 2019. This might signal that revenue progressivity has resumed improvement after almost a decade of modest decline.

We can also briefly examine trends in revenue progressivity on a state-by-state basis, using net changes in substantial progressivity between 1994 and 2019 (i.e., changes in the percent difference in state/local revenue between 30 and 0 percent poverty districts, presented in Figure 19 for 2019 only). During this 25-year period, 27 states saw at least a nominal net improvement in the progressivity of their revenue allocation, including large positive changes (more progressive funding) in Maryland, South Dakota and Nebraska. In contrast, funding became more regressive (or at least less progressive) in 22 states, including large negative net changes in Alaska, Delaware and Missouri.

The key takeaway from Figure 20 is that K-12 state and local revenue in the United States has been neither progressive nor regressive for the past 20 years, while spending has generally been only moderately progressive. Yet it is also clear that the 2007-09 recession had a moderate negative effect on the fairness of education funding in the United States. After a decade of improvement—albeit very slow improvement—between 1998 and 2008, U.S. average revenue and spending progressivity declined during the recession (30/0% progressivity [Figure 19] declined in 28 states between 2007-10, and either declined or did not change more than 3 percentage points in 37 states).

This is largely due to the fact that, in general, higher-poverty districts rely more heavily on state revenue to fund their schools, as their capacity to raise local revenue (e.g., local property taxes) is more constrained than it is for affluent districts. All else being equal, when state revenue declines, as it did during and after the 2007-09 recession, higher-poverty districts take a larger proportional hit, which tends to exacerbate funding inequity (Baker 2014).[13]

[13] One of the unusual features of the Great Recession versus most previous recessions was that property tax revenue, normally a stabilizing force during recessions, decreased markedly due to the collapse of the housing market. Property taxes are the largest source of local revenue, and local revenue is generally regressive—wealthier districts receive more as a share of total revenue. The bursting of the housing market bubble in the late 2000s increased the overall pain level for all districts, but it also hit wealthier districts proportionally harder and for a longer period of time than it did lower-capacity districts. This may have mitigated the decline in progressivity that stemmed from the 2007-09 recession.

These trends, however, vary by state. In fact, there were 25 states in which progressivity exhibited at least a nominal net increase between 2007-19, although these states tended to be those that were less progressive to begin with (there is a rather strong inverse relationship [r=-0.76] between the 2007-19 net change in states' progressivity and their "starting" 2007 progressivity levels). This makes sense, because state revenue cuts will tend to have a more negative equity impact in states that allocate revenue progressively.

In any case, these results illustrate the tremendous variability in the structure and performance of states' school finance systems, but it bears emphasizing the fact that progressivity, unlike adequacy, is almost entirely a function of the policy decisions that states make or have made. Even in states where, for whatever reason, funding is inadequate, equal opportunity can still be preserved via progressive allocation of resources. The fact that so many states are either non-progressive or regressive is by design, and unequal educational opportunity is largely a choice.

3 DISCUSSION

Our three core measures of effort, adequacy and progressivity are specifically chosen to summarize states' systems in terms of how much they raise, who gets the funding, and whether it is enough versus common outcome goals. We have thus far sifted through a lot of data on each of these three measures, but it is important to bear in mind that they work as interdependent cogs in a process that moves funding from taxpayers to states to districts and, ultimately, to schools and classrooms where student outcomes are shaped.

The details are different from state to state, but all systems rely on a basic, relatively simple conceptual model, which is depicted in Figure 21, and can be described as follows:

1. Effort, combined with states' capacity, drives state and local education revenue;
2. The progressivity of state and local systems (ideally) allocates revenue depending on student need (e.g., poverty), which in turn determines per-pupil expenditures for districts at different poverty levels;
3. How these resources are spent, and whether they are sufficient to provide high-quality education to students in each district, determines adequacy and, eventually, shapes student outcomes.

It may be useful to illustrate this interdependency of our three core indicators with hypothetical examples of different state funding systems.

Three illustrative models of school finance systems

Figure 22 presents three hypothetical state funding models. Our three states share three features in common, all of which represent assumptions that effectively nullify the role of state contextual factors, thus allowing for a "pure" comparison of these three model systems:

1. They have the same economic capacity (e.g., GSP), which means a given level of effort will produce the same amount of funding in any of the three states.

Figure 21

Flow of school resources

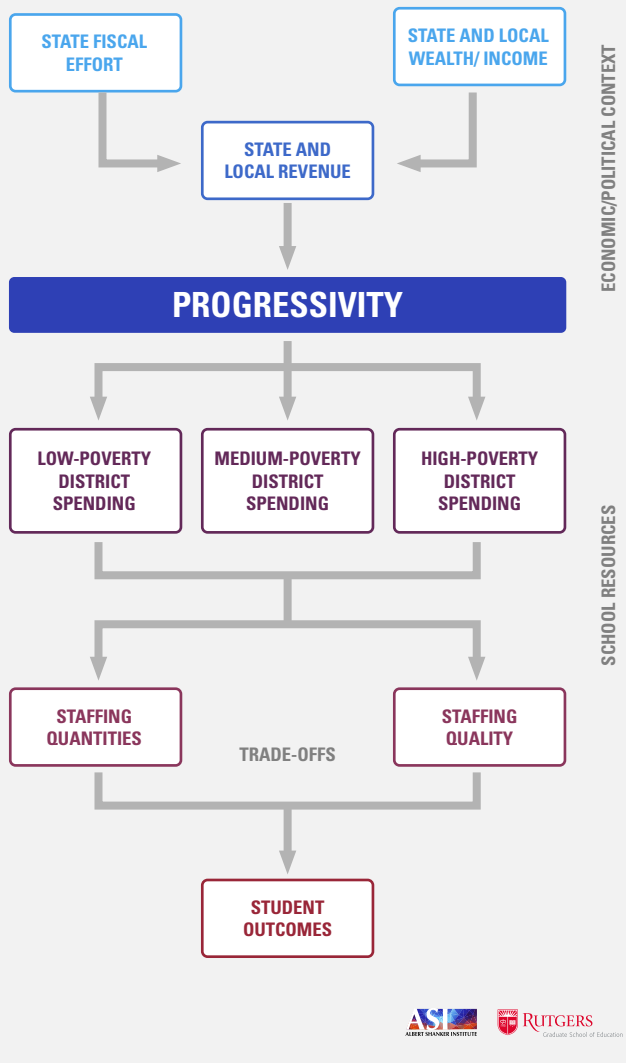
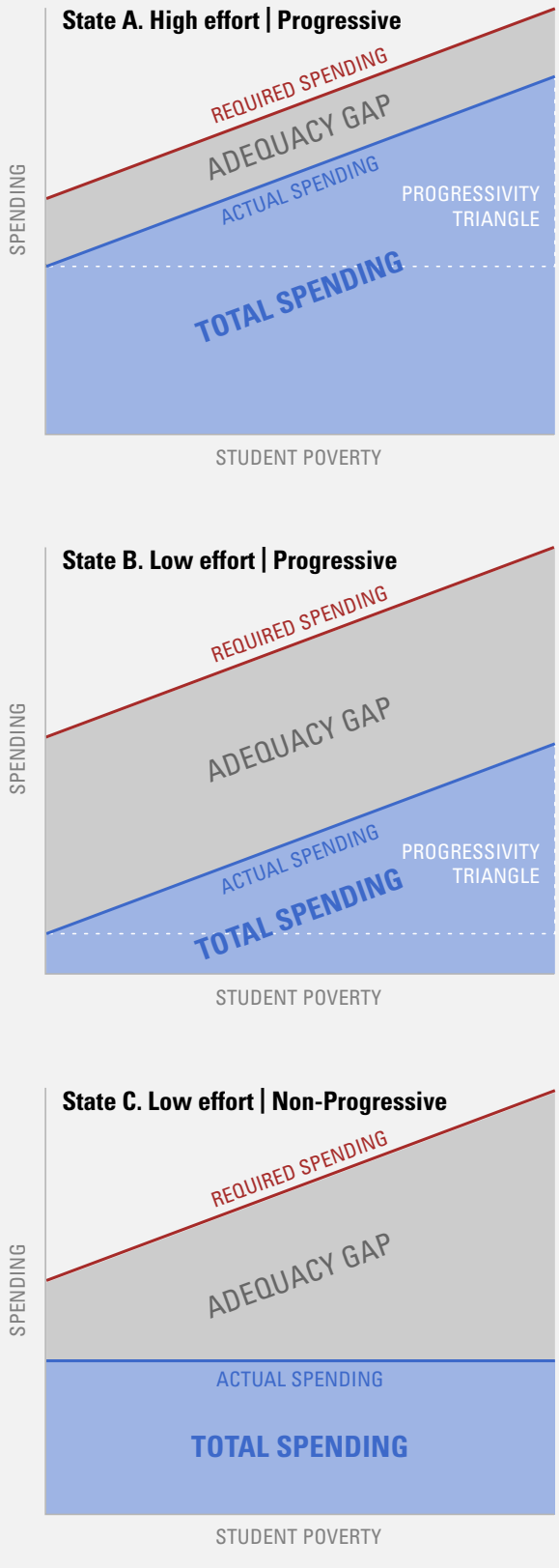


Figure 22

Hypothetical state funding models



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2. Their adequate (i.e., "required") funding targets by poverty, represented in each graph by the red lines, are identical (these targets also, of course, increase with poverty—i.e., the red lines slope upward).
3. They have identical distributions of students by poverty (this assumption simply allows us to interpret the size of the shaded areas in the graphs as representing total amounts).

(Another way to view these three hypothetical states is that they are *one hypothetical state* with three different model finance systems.)

In each state model, the blue lines represent actual spending (by poverty level). Because we assume that enrollment is equal across poverty levels, the blue area underneath the blue spending line represents total spending; a larger area means more total spending.

We begin with State A. This is a high-effort state, and so the blue line representing spending is high up in the plot area, and the size of the blue area beneath the blue line is quite large. Total spending in this state is relatively high.

State A is also a progressive funding state, as you can see from the fact that the blue line slopes upward—i.e., spending increases with student poverty. The size of the "progressivity triangle" in the graph (formed by the white dotted lines with the blue spending line as its hypotenuse) is a visual representation of the "amount" of progressivity; larger triangles indicate more progressivity. State A's blue line is sloped upward fairly steeply, making for a nice large triangle. (Note that, in states with regressive systems, the blue slope would be downward rather than upward, resulting in an inverted triangle that would represent regressivity rather than progressivity.)

Finally, the gray space between the blue line (actual spending) and the red line (required spending) represents State A's "adequacy gap." The size of the gray shaded area between these lines depicts the total amount of additional funding that would be required to achieve adequate outcomes statewide. Due to its high effort, State A's blue line is quite close to its red line (actual funding is inadequate but not tremendously so), and so the total funding

gap (in gray) is somewhat modest in size. Moreover, thanks to State A's progressive funding, the adequacy gap is consistent across student poverty (the red and blue lines run parallel), preserving equal opportunity despite inadequate funding.

Now we can move to State B. This state is just as progressive as State A (the blue line's slope is the same in both states). As a result, the blue "progressivity triangle" is the same size in both states. Unlike State A, however, State B is a low-effort state, and so State B's revenue and thus its spending are lower than State A's. The blue slope in State B is therefore further down in the graph than in State A, and total spending is lower (i.e., the blue area under the blue line is smaller).

So, while State A and State B are equally progressive, there is less revenue to go around in State B. The consequence is a much larger gray-shaded adequacy gap in State B compared with State A.

This comparison illustrates how two states might be identical in how they distribute education resources (in this case, progressively), but, due to different effort levels, they might still differ drastically in terms of how much they spend, and thus in the degree to which that spending is or is not adequate. In other words, without the horsepower of effort, even the most progressive states may fall short of providing adequate resources. Progressivity alone is not enough.

Now let's consider a third and final hypothetical state, State C. In contrast with State B (and State A), funding in State C is neither progressive nor regressive—that is, districts receive the same amount of funding regardless of their student poverty levels. This is clear from State C's blue spending line. Whereas in States A and B, this line slopes upward, it is perfectly flat in State C. As a result, the "progressivity triangle" has disappeared entirely.

But State C shares something in common with State B: They are both low-effort states. They produce the same amount of revenue (less than State A's), as you can see from the fact that the total blue space under the blue line is the same size in both states (it is just a different shape). This also means that the statewide gap between total spending and total required spending is the same in States B and C (the size of the gray area is the same in both states but again is different in shape).

Yet the adequacy situations in States B and C are very different *distributionally*. Their total statewide funding gaps are the same, but in State C they vary by poverty. Specifically, in contrast with the parallel red and blue lines in State B, the spending lines in State C diverge: The line in State C's lower-poverty districts is far closer to adequate (the blue and red lines are closer together) than it is in that state's high-poverty districts.

Just as two states might be equally progressive (or regressive) but spend different amounts, as illustrated by the comparison of States A and B, the converse is also true: States might spend equal amounts (and exhibit the same *total* gap between actual and adequate funding), but, like States B and C, they might still differ in terms of how those resources are distributed (i.e., progressivity). This in turn influences whether adequacy varies by poverty—i.e., whether there is equal opportunity to achieve a common outcome goal.

Evaluating state finance systems

The complexity and multidimensionality of school finance systems belie simple characterization, and assessing systems as a whole is extremely difficult, even when you focus on a small group of measures. In fact, as is evident in our results and in the three hypothetical models above, it is difficult to evaluate the results of one measure without referring to the others, even when we "assume away" differences in state context.

We can, however, use the principles put forth at the beginning of this document as general guidelines for how to use our three core measures to evaluate state finance systems:

1. **Effort:** All else being equal, more effort is better, particularly for states with less capacity. Conversely, however, states with larger economies may not require as much effort as states with smaller economies, and states with inadequate funding might require more effort than states in which funding meets adequacy targets.

2. **Adequacy:** In light of widespread agreement that education outcomes in the United States must improve, we assert, as a general principle, that allocating more resources to schools is better. However, states should also provide resources to schools that are commensurate with achieving desirable common outcomes or improvement toward those outcomes. Adequate funding in one state may be inadequate in another state.
3. **Progressivity:** States' allocation of resources should be progressive—i.e., districts serving more high-needs students should receive more revenue. The optimal degree of progressivity, however, might depend on factors such as differences by district poverty in local capacity, estimated costs or outcomes. Even when funding is inadequate, states can still preserve equal opportunity via progressive allocation of resources.

These general recommendations, like the three hypothetical models discussed above, illustrate the interconnectedness of our core indicators and how they provide a nuanced but relatively concise portrait of school funding. Even the most progressive school funding systems, for example, might still provide resources that are inadequate vis-à-vis common outcome goals, just as the highest-spending states overall might be shortchanging high-needs students if their systems are regressive or non-progressive. Moreover, the lowest-capacity states may simply be incapable of achieving adequate funding regardless of effort.

Overall state scores

The foregoing discussion suggests that boiling states' systems down to single scores or ratings is necessarily reductive and risks oversimplification. It entails subjective decisions about which measures matter and how much, and there's really no way to capture fully the interdependency of indicators or state contextual differences.

On the other hand, a primary goal of the SFID is to evaluate state finance systems in a manner that is accessible and useful to the general public. Requiring those seeking a general sense of how a given state performs to review, contextualize and evaluate the results for three individual measures is burdensome, and we acknowledge that summative ratings, interpreted properly, can be useful. We are therefore publishing overall state scores for the first time.

The scores in this first iteration are calculated very simply. They are a weighted average of the following five components (each component is normalized, and the weights are in parentheses):[14]

1. Adequacy (percent difference between actual and required spending) in the highest-poverty district quintile (weight: 40 percent);
2. Adequacy (percent difference between actual and required spending) in the high-poverty district quintile (20 percent);
3. GSP-based fiscal effort (15 percent);
4. Aggregate state personal income-based fiscal effort (15 percent);
5. Progressivity (percent difference between adjusted revenue in 30-percent and zero-percent poverty districts) (10 percent).

A couple of caveats are in order. First, each state's score represents its performance on these five measures relative to other states, and not to any absolute standard of "good" or "bad." In other words, states with higher scores do not necessarily have good systems per se, only better systems compared with other states on our selected measures using our selected weights. Second, and most obviously, the measures we have selected, as well as the weights we have assigned, reflect our subjective judgments as to the importance of each indicator.

That said, states' overall scores are presented in Figure 23. A score of 50 can be roughly interpreted as average. Ranks may reflect differences in unrounded scores. Scores are not available for the District of Columbia, Hawaii and Vermont, as they are missing one or more of the measures used to calculate the scores.

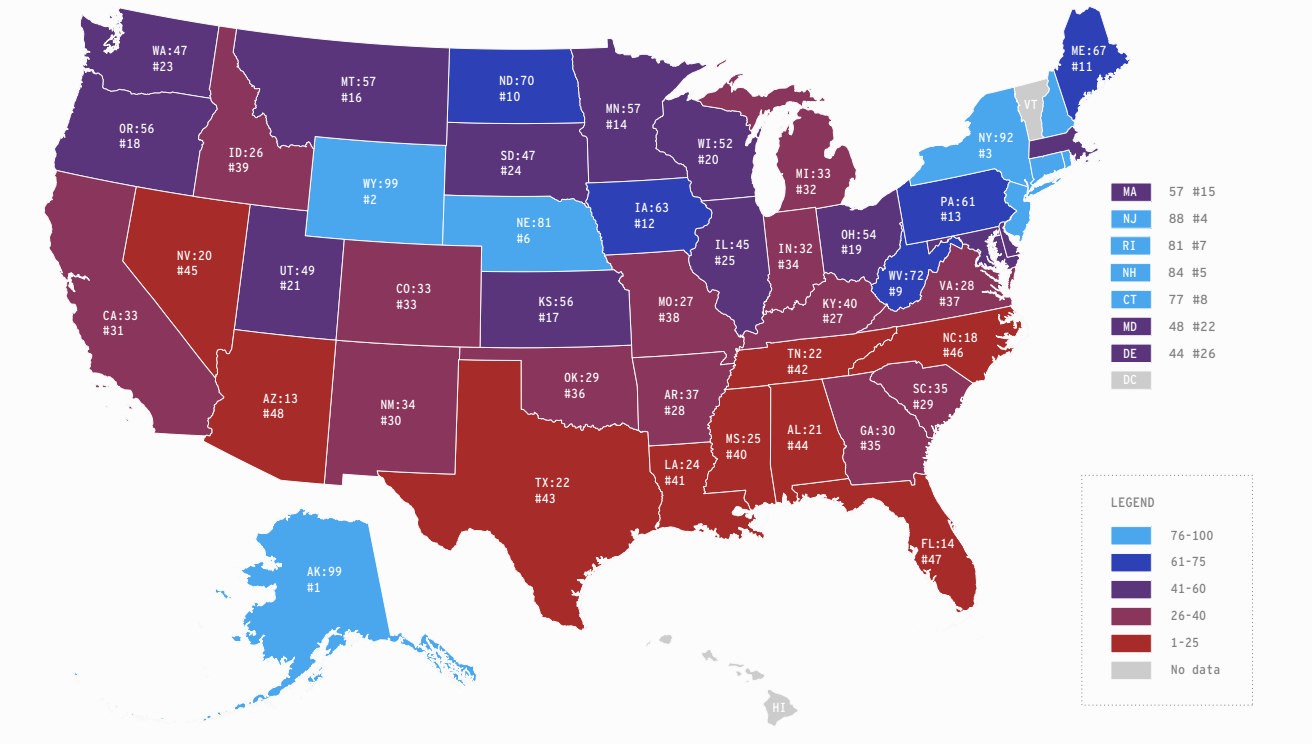
There are, of course, no surprises in Figure 23. Alaska and Wyoming, which consistently score extremely highly on all three measures, top the list with scores of 99, followed moderately closely by New York (92) and New Jersey (88).

[14] Each measure is converted to z-scores (top-coded at +/-3 standard deviations), and the weighted multi-measure averages of these z-scores are expressed as percentile equivalents (e.g., a weighted average of zero is an overall score of 50). D.C., Hawaii and Vermont are excluded from all calculations.

Figure 23

Overall state finance system scores

Weighted average of normalized effort, adequacy and progressivity measures, by state, 2019



NOTE:
See report text for calculation of scores. State ranks may reflect differences concealed by rounding. Graph does not include Hawaii, D.C. and Vermont (not all measures available).

Source: School Finance Indicators Database

Conversely, Arizona (13) and Florida (14) receive the lowest scores, with North Carolina (18) and Nevada (20) coming in a little higher. These lowest-scoring states are still considerably above the hypothetical minimum score (1) because none of them is bottom of the pack on all three measures. Arizona, for example, has the nation's second-lowest effort level (on both the GSP- and income-based versions), but its adequacy scores, while low, are "only" about the 10th lowest in the nation, and its progressivity score is rather middle of the pack.

As readers may already have noticed when reviewing the results for each indicator, there is a rather inconsistent relationship between the performance of states' systems and common, simplified characterizations of states' political leanings (for instance, the correlation of the scores with the percent voting for the Democratic candidate in the 2020 presidential race is close to zero). Although there are several heavily Democratic states with high scores, such as New York, New Jersey and other northeastern states, several "blue" states, such as California and Maryland, have scores toward the bottom of the distribution.

One factor generating noise in this association is the fact that four of the top 10 states in Figure 23 (Alaska, North Dakota, West Virginia and Wyoming), including the top two (Wyoming and Alaska), are heavily Republican states that also happen to generate substantial revenue through the extraction of natural resources (e.g., via severance taxes). This, as discussed above, is a particularly volatile source of revenue (e.g., due to changes in energy prices), and education funding in these states can therefore fluctuate quite dramatically over relatively short periods of time, but this revenue certainly contributes to these states' performance. Yet not all of the high-scoring "red states" are big energy producers (e.g., Iowa and Nebraska both appear near the top of the distribution), and not all energy producers score highly (e.g., Texas).

4 CONCLUSION

A large and growing body of high-quality empirical research has shown that the amount and distribution of school funding has a substantial effect on student outcomes. Moreover, while the issue of how to spend money remains contentious, the centrality of funding to improving outcomes has slowly garnered a political consensus in all but the most extreme ideological camps. The idea that "money doesn't matter" is no longer defensible.

Yet states' K-12 finance systems are highly complex, and often difficult to understand for policymakers, parents and the general public. Based on our extensive experience collecting, analyzing and disseminating finance data, and in collaboration with other researchers and organizations, we have designed a range of indicators that we believe capture the complexity of school finance in a manner that is useful and comprehensible to all stakeholders.

In this report, we have presented data from three types of measures included in this system: effort, adequacy and progressivity. These are the three that we feel provide the most succinct but informative picture of the fiscal resources raised and allocated by states' school finance systems.

Our results, on the whole, are troubling. In the typical state, there are, in a sense, two school systems. In one of them are lower-poverty districts, where resources are abundant relative to costs. In the other, we find districts serving higher-poverty residents, whose schools receive only about 80 percent of the funding they need to achieve the relatively modest goal of national average test scores.

The math here is fairly simple. Wealthier districts have the means to fund their neighborhood schools adequately (and beyond); poorer districts often do not. States are responsible for filling those gaps.

To be clear, a handful of states do this job at least fairly well. They allocate resources progressively, devote relatively large shares of their economies to education, and/or spend adequately even in their higher-poverty districts. But they are the exception. And this is not an accident or some unfortunate confluence of circumstances. While there are certainly factors at play here that are outside of states' control (e.g., small tax bases, higher-poverty student populations), states' failure to fund schools properly is largely a policy choice.

The typical state is devoting a smaller share of its economic capacity to public schools than it has in at least 20 years, and is distributing those funds non-progressively. It is hardly surprising that we find spending levels far below our (modest) adequacy targets in most states' higher-poverty districts, and large discrepancies by student race and ethnicity. Put bluntly, many states cut public school funding to balance their budgets during and after the 2007-09 recession and never restored it. This, of course, is not to say that these states' systems were excellent before the recession; most were far from it. But they've made a bad situation worse. And, should the current pandemic-related slowdown turn into a serious budgetary crisis in any of these states, they will be even more ill-prepared to weather the storm than they were the last time.

The good news, though, is that these are not insurmountable problems. As an illustration, we've shown

that if states simply returned to their pre-recession effort levels, they could hypothetically pay off one-half of all negative funding gaps in the United States. The additional funding would be equivalent to an increase in state and local direct K-12 spending of about 10 percent, not by imposing unprecedented tax rates but simply by devoting the same slices of their "economic pies" to schools as they did just 15 years ago.

We've also argued that additional federal aid might be targeted at states such as Mississippi and Arkansas, whose effort levels are relatively high but economies are so small—and costs so high—that adequate funding is virtually impossible. Conversely, fewer federal dollars might be directed toward states, such as California and Florida, that have the economic capacity to improve school funding but are not using it.

Federal funds can (and do) help, but the bulk of the improvement in U.S. school funding policy will have to come from action on the part of states, as they are responsible for raising and distributing the vast majority of K-12 funds in the country. And these are essentially 51 different systems. None is perfect, and virtually all have at least some redeeming features. Such complexity can be daunting and frustrating, but it has also allowed researchers over the decades to examine how variation in the design of systems leads to variation in results. The upside is that we generally know what a good finance system looks like. But evaluating and ultimately improving states' systems starts with credible, high-quality data and analysis.

We are once again making all of our data and full documentation freely available to the public at the SFID website (https://schoolfinancedata.org), along with single-page profiles of each state's finance system, online data visualizations and other resources. It is our ongoing hope and intention that the SFID, including the data presented in this report, can inform our national discourse about education funding, as well as guide legislators in strengthening their states' systems.

References

- Baker, Bruce D. 2014. Evaluating the Recession's Impact on State School Finance Systems. *Education Policy Analysis Archives* 22(91). http://dx.doi.org/10.14507/epaa.v22n91.2014.

- Baker, Bruce D. 2017. *How Money Matters for Schools.* Palo Alto, CA: Learning Policy Institute.

- Baker, Bruce D. 2018. *Educational Inequality and School Finance: Why Money Matters for America's Students*. Cambridge, MA: Harvard Education Press.

- Baker, Bruce D. 2020. *How We Developed the National Education Cost Model.* Washington, DC: The Century Foundation.

- Baker, Bruce D., and Di Carlo, Matthew. 2020. *The Coronavirus Pandemic and K-12 Education Funding.* Washington, DC: Albert Shanker Institute.

- Baker, Bruce D., Di Carlo, Matthew, and Weber, Mark. 2021. *The Adequacy of School District Spending in the U.S.* Washington, D.C.: Albert Shanker Institute.

- Baker, Bruce D., Srikanth, Ajay, Cotto, Robert Jr., and Green III, Preston C. 2020. School Funding Disparities and the Plight of Latinx Children. *Education Policy Analysis Archives* 28(135). https://doi.org/10.14507/epaa.28.5282.

- Baker, Bruce D., and Weber, Mark. 2021. Separate and Unequal: *Racial and Ethnic Segregation and the Case for School Funding Reparations in New Jersey.* Trenton, NJ: New Jersey Policy Perspective.

- Baker, Bruce D., Weber, Mark, and Srikanth, Ajay. 2021. Informing Federal School Finance Policy with Empirical Evidence. *Journal of Education Finance* 47(1): 1-25.

- Baker, Bruce D., Weber, Mark, Srikanth, Ajay, Kim, Robert, and Atzbi, Michael. 2018. *The Real Shame of the Nation: The Causes and Consequences of Interstate Inequity in Public School Investments.* New Brunswick, NJ: Rutgers University.

- Candelaria, Christopher A., and Shores, Kenneth A. 2019. Court-Ordered Finance Reforms in the Adequacy Era: Heterogeneous Causal Effects and Sensitivity. *Education Finance and Policy* 14(1): 31-60.

- Cornman, Stephen Q., Nixon, Laura C., Spence, Matthew J., Taylor, Lori L., and Geverdt, Doug E. 2019. Education Demographic and Geographic Estimates (EDGE) Program: American Community Survey Comparable Wage Index for Teachers (ACS-CWIFT) (NCES 2018-130). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved from: http://nces.ed.gov/pubsearch.

- Duncombe, William, and Yinger, John. 2008. Measurement of Cost Differentials. In Ladd, Helen F., and Fiske, Edward. (eds.), *Handbook of Research in Educational Finance and Policy* (203-21). New York: Routledge.

- Geverdt, Doug. 2019. *Education Demographic and Geographic Estimates Program (EDGE): School Neighborhood Poverty Estimates*, 2016-2017 (NCES 2019-112). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved from: http://nces.ed.gov/pubsearch.

- Jackson, C. Kirabo. 2020. "Does School Spending Matter? The New Literature on an Old Question." In Tach, Laura, Dunifon, Rachel, and Miller, Douglas L. (eds.), *Confronting Inequality: How Policies and Practices Shape Children's Opportunities* (165-86). Cambridge, MA: National Bureau of Economic Research.

- Jackson, C. Kirabo, Johnson, Rucker C., and Persico, Claudia. 2016. The Effects of School Spending on Educational and Economic Outcomes: Evidence from School Finance Reforms. *The Quarterly Journal of Economics* 131(1): 157-218.

- Jackson, C. Kirabo, Wigger, Cora, and Xiong, Heyu. 2021. Do School Spending Cuts Matter? Evidence from the Great Recession. *American Economic Journal* 13(2): 304-35.

- Koski, William S., and Reich, Rob. 2006. When "Adequate" Isn't: The Retreat from Equity in Educational Law and Policy and Why It Matters. *Emory Law Journal* 56(30): 545-617.
- Kuhfeld, Megan, Soland, James, Tarasawa, Beth, Johnson, Angela, Ruzek, Erik, and Liu, Jing. 2020. Projecting the Potential Impact of COVID-19 School Closures on Academic Achievement. *Educational Researcher* 49(8): 549-65.
- Lafortune, Julien, Rothstein, Jesse, and Whitmore Schanzenbach, Diane. 2018. School Finance Reform and the Distribution of Student Achievement. *American Economic Journal: Applied Economics* 10(2): 1-26.
- Leachman, Michael, Masterson, Kathleen, and Figueroa, Eric. 2017. *A Punishing Decade for School Funding.* Washington, DC: Center on Budget and Policy Priorities.
- Leachman, Michael, and McNichol, Elizabeth. 2020. *Pandemic's Impact on State Revenues Less Than Earlier Expected but Still Severe.* Washington, DC: Center on Budget and Policy Priorities.
- National Association of State Budget Officers. 2021. *The Fiscal Survey of States: Spring 2021.* Washington, DC: National Association of State Budget Officers.
- National Center for Education Statistics. *Common Core of Data (1993-2019).* Washington, DC: National Center for Education Statistics. https://nces.ed.gov/ccd.
- Reardon, Sean F., Ho, Andrew D., Shear, Benjamin R., Fahle, Erin M., Kalogrides, Demetra, Jang, Heewon, Chavez, Belen. 2021. Stanford Education Data Archive (Version 4.0). Palo Alto, CA: Stanford University. http://purl.stanford.edu/db586ns4974.
- Shores, Kenneth, and Steinberg, Matthew P. 2019. Schooling During the Great Recession: Patterns of School Spending and Student Achievement Using Population Data. *AERA Open* 5(3).
- Taylor, Lori I. 2014. Extending the NCES Comparable Wage Index. College Station, TX: Texas A&M University. http://bush.tamu.edu/research/faculty/Taylor_CWI.
- Taylor, Lori I., and Fowler Jr., William J. 2006. *A Comparable Wage Approach to Geographic Cost Adjustment.* Research and Development Report (NCES 2006-321). Washington, DC: National Center for Education Statistics. http://bush.tamu.edu/research/faculty/Taylor_CWI.
- U.S. Census Bureau. 2021. *Annual Survey of School System Finances (2019).* Washington, DC: U.S. Census Bureau. https://census.gov/programs-surveys/school-finances.html.
- U.S. Census Bureau. 2020. *Small Area Income and Poverty Estimates (1993-2019).* Washington, DC: U.S. Census Bureau. https://census.gov/programs-surveys/saipe.html.
- U.S. Census Bureau. *Decennial Census of Population and Housing (2000 and 2010).* Washington, DC: U.S. Census Bureau. https://census.gov/programs-surveys/decennial-census.html.
- Verstegen, Deborah A. 2011. Public Education Finance Systems in the United States and Funding Policies for Populations with Special Educational Needs. *Education Policy Analysis Archives* 19(21): 1-30. https://doi.org/10.14507/epaa.v19n21.2011.

APPENDIX TABLES

Table A1. Information on data sources

Indicator	Variable(s)	Source
Fiscal effort	Total state and local expenditures, direct to K-12 education	U.S. Census Bureau—Annual Survey of State and Local Government Finances https://census.gov/programs-surveys/gov-finances.html
	Gross state product and aggregate state personal income	U.S. Bureau of Economic Analysis https://bea.gov
Progressivity (and adjusted/equated spending)	Child poverty (5- to 17-year-olds)	U.S. Census Bureau —Small Area Income and Poverty Estimates (SAIPE) https://census.gov/programs-surveys/saipe.html
	State and local revenue and current spending per pupil	NCES CCD Public Elementary-Secondary Education Finance Survey (F33) https://nces.ed.gov/ccd/files.asp
	Regional wage variation	Education Comparable Wage Index https://bush.tamu.edu/research/taylor-cwi/
	District size/enrollment	NCES Common Core of Data—Local Education Agency Universe Survey https://nces.ed.gov/ccd/files.asp
	Population density	U.S. Census Bureau—Population Estimates https://census.gov
Adequacy (relative to common goals)	Estimated required and actual spending, by poverty quintile	National Education Cost Model (NECM)[a]
	Nationally normed test scores (2009-18)	Stanford Education Data Archive (Reardon et al. 2021) http://purl.stanford.edu/db586ns4974
	Regional wage variation	Education Comparable Wage Index https://bush.tamu.edu/research/taylor-cwi

Note: This table includes data sources only for state-level variables presented directly in this report. For more information on these variables and their sources, see the documentation for the SFID State Indicator Database at the SFID website (https://schoolfinancedata.org).

[a] The NECM incorporates variables from sources in addition to those listed in the indented rows. For more details, see Baker et al. (2021) and Baker (2020)

Table A2. Adjusted current spending per pupil by Census district poverty level, 2019

State	0% poverty	10% poverty	20% poverty	30% poverty
Alabama	$10,107	$10,232	$10,359	$10,487
Alaska	11,730	16,322	22,711	31,603
Arizona	7,066	7,629	8,237	8,894
Arkansas	9,172	9,855	10,589	11,377
California	10,252	11,230	12,301	13,475
Colorado	9,531	10,144	10,797	11,492
Connecticut	19,486	18,598	17,751	16,942
Delaware	14,193	14,791	15,413	16,062
District of Columbia	n/a	n/a	n/a	n/a
Florida	9,062	9,472	9,900	10,348
Georgia	9,775	10,364	10,988	11,649
Hawaii	n/a	n/a	n/a	n/a
Idaho	6,759	7,965	9,385	11,059
Illinois	15,285	14,753	14,240	13,745
Indiana	9,039	10,067	11,211	12,485
Iowa	9,816	11,149	12,663	14,383
Kansas	9,888	11,131	12,530	14,105
Kentucky	11,098	11,462	11,838	12,227
Louisiana	10,584	11,028	11,490	11,971
Maine	14,341	14,375	14,409	14,443
Maryland	12,969	13,579	14,218	14,888
Massachusetts	14,925	15,509	16,115	16,746
Michigan	10,058	10,700	11,382	12,108
Minnesota	10,115	11,784	13,728	15,994
Mississippi	8,123	8,694	9,304	9,957
Missouri	10,667	10,670	10,673	10,676
Montana	10,291	11,614	13,106	14,791
Nebraska	9,924	12,441	15,596	19,551
Nevada	11,738	10,303	9,043	7,937
New Hampshire	16,651	15,889	15,161	14,467
New Jersey	17,552	17,471	17,390	17,310
New Mexico	8,326	9,167	10,093	11,113
New York	22,322	21,959	21,603	21,252
North Carolina	8,626	9,250	9,919	10,636
North Dakota	10,768	13,052	15,821	19,177
Ohio	10,431	11,527	12,737	14,075
Oklahoma	7,827	8,619	9,490	10,450
Oregon	10,350	10,932	11,548	12,198
Pennsylvania	16,073	15,137	14,255	13,424
Rhode Island	16,322	15,890	15,470	15,061
South Carolina	9,346	10,349	11,461	12,692
South Dakota	8,596	10,054	11,758	13,752
Tennessee	8,812	9,432	10,095	10,806
Texas	8,041	8,622	9,244	9,911
Utah	6,500	8,081	10,047	12,491
Vermont[a]	20,970	20,609	20,255	19,907
Virginia	11,603	11,818	12,037	12,260
Washington	12,033	12,684	13,371	14,094
West Virginia	12,044	12,339	12,642	12,952
Wisconsin	11,260	12,124	13,055	14,058
Wyoming	14,929	17,502	20,517	24,052

Note: Per-pupil spending estimates predicted for district poverty levels (columns), adjusting for district size (>2,000), population density (average) and regional wage variation (Comparable Wage Index for Teachers=1.0). Estimates not available for D.C. or Hawaii. See the SID user's guide for more details on the data and models.

[a] Interpret Vermont estimates with caution.

Table A3. Percentage difference between actual spending and estimated spending required to achieve U.S. average test scores, by state and district poverty, 2019

	District poverty quintile				
State	**Lowest**	**Low**	**Medium**	**High**	**Highest**
Alabama	9.0%	-25.0%	-39.0%	-40.4%	-54.1%
Alaska	115.7	67.6	140.7	137.2	51.3
Arizona	-0.3	-26.5	-31.5	-42.2	-38.4
Arkansas	3.1	-24.6	-28.1	-35.2	-45.4
California	24.7	3.8	-9.7	-15.7	-26.5
Colorado	34.0	18.8	-15.9	-16.9	-19.8
Connecticut	210.4	197.8	165.0	110.0	13.6
Delaware	31.8	24.9	18.2	5.4	-11.6
District of Columbia	n/a	n/a	n/a	n/a	-6.6
Florida	-5.2	-27.6	-29.6	-29.7	-35.3
Georgia	-13.6	-27.4	-37.8	-33.7	-47.6
Hawaii	n/a	n/a	n/a	n/a	n/a
Idaho	4.8	2.1	-8.8	-22.3	-24.8
Illinois	138.1	68.4	34.5	6.8	-13.8
Indiana	58.6	24.1	3.6	-11.6	-27.0
Iowa	81.5	40.5	24.5	12.9	-7.9
Kansas	83.6	35.7	24.3	3.8	-18.2
Kentucky	36.5	8.6	4.4	-14.9	-27.3
Louisiana	5.0	-27.9	-25.6	-38.4	-37.0
Maine	138.0	63.0	25.2	9.8	2.5
Maryland	58.3	17.0	-9.1	45.8	-30.3
Massachusetts	170.5	140.7	118.3	78.9	5.9
Michigan	52.0	22.9	-7.1	-11.7	-36.1
Minnesota	80.1	33.0	21.5	9.3	-16.0
Mississippi	-24.7	-38.7	-47.8	-54.5	-60.5
Missouri	49.6	12.9	-18.2	-24.9	-38.3
Montana	53.5	28.0	45.7	9.8	-3.7
Nebraska	98.2	44.3	30.0	-9.6	30.2
Nevada	32.9	-2.5	12.6	7.2	-36.1
New Hampshire	202.3	177.1	141.7	89.5	35.3
New Jersey	167.2	141.8	91.6	58.3	15.6
New Mexico	-8.2	-22.7	-12.3	-26.2	-43.7
New York	265.8	158.1	101.6	72.2	23.6
North Carolina	-16.1	-12.9	-33.0	-35.5	-39.9
North Dakota	75.0	49.6	47.7	18.4	13.4
Ohio	94.0	38.2	21.5	6.0	-26.0
Oklahoma	30.5	-2.1	-18.2	-33.1	-32.2
Oregon	28.7	19.5	-3.1	-9.8	-3.3
Pennsylvania	166.4	103.3	60.5	45.1	-18.7
Rhode Island	252.1	171.6	156.6	88.6	-4.3
South Carolina	-10.0	-22.4	-26.4	-33.2	-46.2
South Dakota	57.9	31.6	26.4	-3.7	-6.0
Tennessee	14.8	-15.6	-7.3	-17.3	-30.7
Texas	-11.1	-26.9	-36.6	-37.3	-47.8
Utah	25.5	18.1	-16.2	0.3	-15.1
Vermont	n/a	n/a	n/a	n/a	n/a
Virginia	18.2	0.5	1.2	-24.5	-36.2
Washington	68.8	38.2	21.7	18.7	-15.8
West Virginia	51.9	37.2	30.7	20.8	8.8
Wisconsin	105.9	59.8	37.1	20.5	-17.9
Wyoming	155.0	139.8	116.9	96.0	83.5

Note: Estimates from the National Education Cost Model, published as part of the School Finance Indicators Database (see SID documentation for more information about the model). Estimates not available for Hawaii and Vermont, and are only available for the highest-poverty quintile in D.C. District poverty quintiles calculated state by state using U.S. Census Bureau data (poverty among 5- to 17-year-olds).

$$(\ln)\textbf{SCHOOL} = b_0 + b_1 State_i + b_2 LaborMarket_{ij} + b_3 CWI_{ij} + b_4 \textbf{FINANCE}_{ij} + b_5 PopulationDensity_{ij} + b_6 Enrollment_{ij} + b_7 \textbf{INDICATORS}_{ij} + b_8 Scale_{ij} + b_9 Poverty_{ij} + b_{10} SchlType_{ij} + b_{11} \textbf{DATABASE}_{ij} + e$$

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