

# THE ADEQUACY AND FAIRNESS OF STATE SCHOOL FINANCE SYSTEMS

Fifth Edition  
December 2022

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Matthew Di Carlo  
Mark Weber





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**FIFTH EDITION**

School Year 2019-20  
[schoolfinancedata.org](http://schoolfinancedata.org)

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**DECEMBER 2022**



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Report design by Megan Gilmore

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# EXECUTIVE SUMMARY



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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 grid-work of funding rules and formulas that have evolved over decades of political wrangling, legislation and litigation. In most states, only a small group of people fully understand how billions of public dollars make their annual migration from states to districts to schools and classrooms.

Yet these funding systems have dramatic consequences for millions of public school students. Over the past 10-15 years, there has emerged a growing consensus, supported by high-quality empirical research, that additional funding improves student outcomes (and funding cuts hurt those outcomes), particularly among disadvantaged students. There are, of course, serious and important debates about how education funding should be spent. Yet virtually all potentially effective policies and approaches

require investment, often substantial investment. Proper funding, in other words, is a necessary (but not sufficient) requirement for improving student outcomes. Understanding, assessing, and reforming states' funding systems is therefore a crucial part of any efforts to bring about such improvement.

In this report, we evaluate the K-12 school finance systems of all 50 states and the District of Columbia. The latest year of data presented pertains to the 2019-20 school year, but we also examine trends in our measures going back 10-15 years.

## HOW WE EVALUATE STATES' SYSTEMS

Most analyses and discussions of school funding focus on how much states (or districts) spend. This is obviously important information, but by itself it is a rather blunt tool for evaluating K-12 finance systems. The more appropriate question is whether that funding is enough. Some districts require more resources than others to achieve a given level of outcomes, due to differences in students served (e.g., poverty), labor costs, and other factors. Simply comparing how much states or districts spend ignores this enormous variation in how much they must spend to meet their students' needs.

Accordingly, we use a national cost model to calculate adequate funding levels for the vast majority of the nation's public school districts. We then use these estimates to evaluate each state based on the overall adequacy of funding across all its districts (**statewide adequacy**) as well as the degree to which high-poverty districts are more or less adequately funded than affluent districts

## STATE PROFILES

Accompanying this report are single-page profiles summarizing the performance 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 state database, along with user-friendly documentation, online data visualizations, supplemental research reports, and other resources at the SFID project website: [schoolfinancedata.org](http://schoolfinancedata.org).

(**equal opportunity**). Finally, because states vary quite drastically in their ability to raise revenue, we also assess whether states are leveraging their capacity to fund schools by measuring total state and local spending as a percentage of states' economies (**fiscal effort**).

These three “core indicators”—effort, statewide adequacy, and equal opportunity—offer a parsimonious overview of whether states' systems are accomplishing their primary

goal of providing adequate and equitable funding for all students, regardless of their backgrounds.

Summary characterizations of each state's performance on our three core indicators are presented in Table Exec1. But we begin by summarizing our results in terms of **8 major findings about the overall state of K-12 school finance systems in the U.S.**

## FISCAL EFFORT

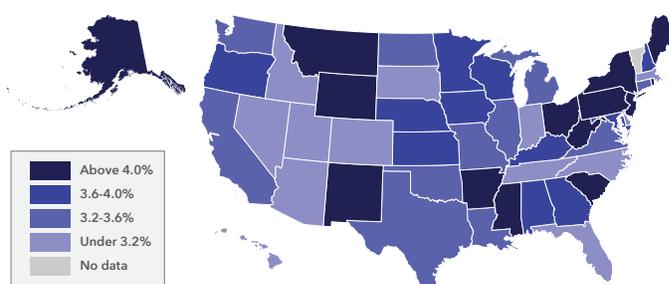
How much of each state's economic capacity goes to K-12 schools?

**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 (e.g., smaller economies from which to draw tax revenue) from those that simply refuse to devote sufficient resources to their public schools.

### 1 STATES DEVOTE WIDELY VARYING SHARES OF THEIR “ECONOMIC PIES” TO THEIR PUBLIC SCHOOLS.

- Effort ranges from roughly 2.5 percent in Arizona and Hawaii to 4.6 percent in New Jersey and Wyoming.
- Low effort states with widely inadequate funding, such as Arizona, Florida, Nevada, and North Carolina, are essentially choosing to underfund their schools, as they have the capacity to raise more revenue.
- In contrast, several states, most notably Arkansas, Mississippi, New Mexico, and South Carolina, also exhibit widespread underfunding but put forth high effort. These states, due to their high poverty and smaller economies, may require new federal aid to meet their students' needs.

K-12 fiscal effort by state, 2020

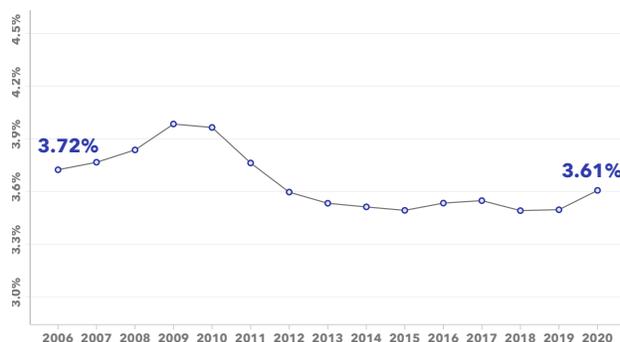


See Figure 2 for full map with state-by-state estimates.

### 2 THE PERSISTENT DECLINE IN EFFORT SINCE THE 2007-09 RECESSION COST SCHOOLS ALMOST \$300 BILLION BETWEEN 2016 AND 2020.

- Average 2016-2020 effort is lower than it was prior to the recession in 39 states. Had all states recovered to their own pre-recession effort levels by 2016, total K-12 funding between 2016 and 2020 would have been \$288 billion higher (over 8 percent).
- U.S. average effort increased from 3.5 to 3.6 percent between 2019 and 2020, but this is likely a temporary, “illusory” bump due to the pandemic's effect on states' economies in early 2020, rather than to increased K-12 investment.

National K-12 fiscal effort trend, 2006-2020



See Figure 4 for complete graph.

## STATEWIDE ADEQUACY

How many of a state's students attend underfunded districts?

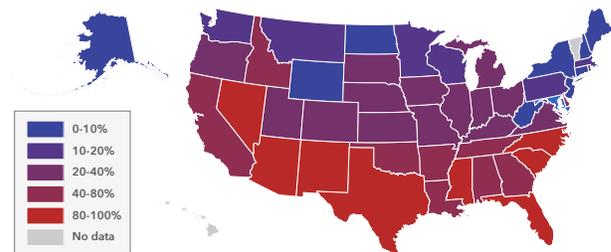
Whereas effort measures how hard states work to raise education funds, adequacy addresses whether the amount raised is enough. Our adequacy estimates compare each district's actual spending to cost model estimates of spending levels required to achieve the (modest) goal of U.S. average test scores. This statewide measure gauges overall adequacy in terms of, for instance, the percentage of each state's students in districts with inadequate funding.

### 3

DEPENDING ON ONE'S STATE, THE LIKELIHOOD OF ATTENDING SCHOOL IN AN UNDERFUNDED DISTRICT RANGES FROM ZERO TO NEAR CERTAINTY.

- By the modest standard of funding adequate to achieve national average outcomes, the percent of students in districts with below adequate funding varies from zero in Wyoming to roughly 90 percent in states such as Arizona, Florida, Mississippi, Nevada, North Carolina, and Texas.
- If we express statewide adequacy in terms of the percentage difference for the typical student, gaps range from -37 percent (the typical student's district spends 37 percent below adequate levels) in Mississippi to over +100 percent (actual spending is double required spending) in Wyoming.

Percent of students in underfunded districts by state, 2020



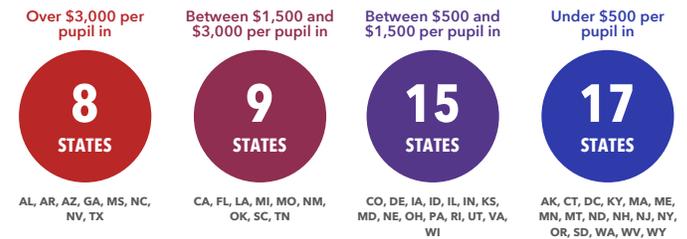
See Figure 8 for state-by-state estimates.

### 4

CLOSING ALL OF THE NATION'S NEGATIVE FUNDING GAPS—I.E., ACHIEVING UNIVERSAL ADEQUACY—WOULD REQUIRE ALMOST \$100 BILLION IN ADDITIONAL FUNDING.

- In order to raise all districts to adequate funding levels without redirecting any money from districts in which funding is already above our (modest) cost targets, total spending would have to increase approximately \$95 billion, or 15 percent.
- Virtually every state has districts in which spending is below estimated adequate levels; inadequate funding is a national problem.
- However, roughly 60 percent of the \$95 billion in new funding would go to districts in just five states—California, Florida, Georgia, North Carolina, and Texas—which together serve only about one-third of all students.

How much would states have to increase funding to close all their negative funding gaps?



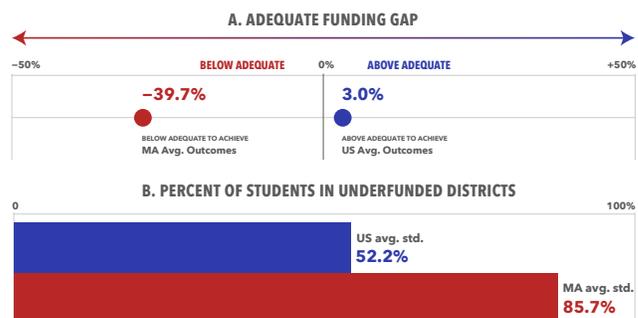
See Figure 9 for state-by-state estimates.

### 5

INCREASING THE ADEQUACY BENCHMARK TO A MORE AMBITIOUS GOAL DRASTICALLY INCREASES THE COST OF UNIVERSAL ADEQUACY.

- For example, the cost of bringing all districts up to the funding levels necessary to achieve the very ambitious goal of Massachusetts average test scores would require \$441 billion in additional funding.
- By this Massachusetts standard, which may be more appropriate for evaluating some states' funding (e.g., those with higher academic standards), the typical student's district spends almost 40 percent (-39.7%) below estimated adequate levels, and 86 percent of students attend schools in underfunded districts, including virtually every single student (98-100 percent) in 16 states.

National adequacy by outcome goal (U.S. vs. Massachusetts average outcomes), 2020



See Figure 10 for state-by-state estimates.

## EQUAL OPPORTUNITY

Are high-poverty districts in a state less adequately funded than its low-poverty districts?

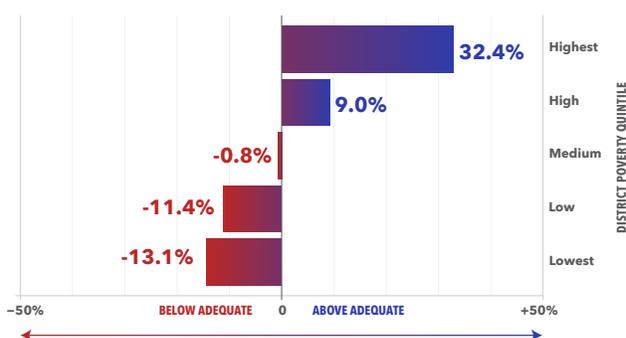
Equal opportunity uses the same district-by-district adequacy estimates as our statewide adequacy measure, but focuses instead on the degree to which adequacy varies between districts in each state—i.e., whether some students have a better chance at achieving a given outcome goal than do others. We measure equal opportunity by comparing adequacy in states' highest-poverty districts with that in their lowest-poverty districts.

### 6

**UNEQUAL OPPORTUNITY IS A UNIVERSAL FEATURE OF STATE SCHOOL FINANCE SYSTEMS.**

- On average, the nation's highest-poverty districts spend about 13 percent below estimated adequate levels, whereas the most affluent districts spend over 32 percent above adequate levels. This is an average "opportunity gap" of -45 percentage points.
- Lower-poverty districts in the U.S. are essentially funded to achieve better outcomes than are higher-poverty districts.
- These "opportunity gaps" are found in every single state, but they vary drastically in magnitude—from around -20 points in Florida and North Dakota to over -200 points in Connecticut, New York, and Rhode Island.

U.S. school funding adequacy by Census district poverty, 2020



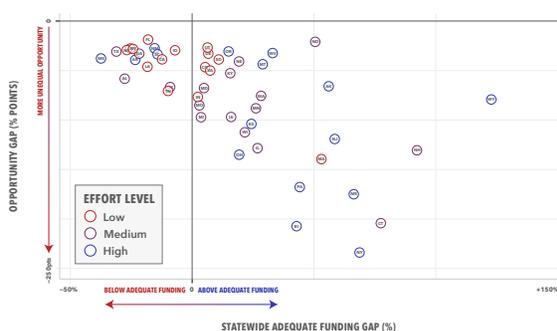
See Figures 15 and 16 for state-by-state estimates.

### 7

**THE MOST ADEQUATELY FUNDED STATES HAVE THE MOST UNEQUAL OPPORTUNITY, AND VICE-VERSA.**

- States with relatively adequate funding overall tend to be those in which opportunity is most unequal, whereas states with more moderately unequal opportunity are usually those with widespread inadequate funding.
- This reflects, for instance, the fact that most of the states with comparatively adequate funding are high inequality states with more fragmented district structures. Conversely, more equal opportunity may simply be easier to achieve when spending overall is inadequate, as there isn't enough funding to generate large gaps.

Equal opportunity gaps by statewide adequate funding gaps, 2020



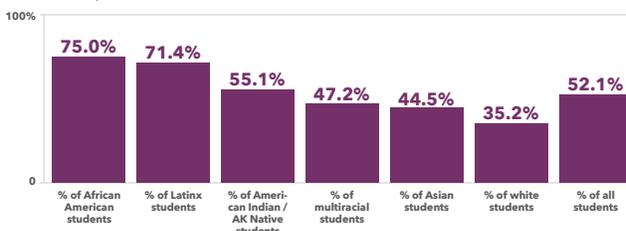
See Figure 21 for full graph.

### 8

**AFRICAN AMERICAN AND LATINX STUDENTS ARE TWICE AS LIKELY AS THEIR WHITE PEERS TO BE IN UNDERFUNDED DISTRICTS.**

- Roughly 35 percent of the nation's white students attend schools in underfunded districts, compared with 75 percent of their African American peers and 71 percent of Latinx students.
- Similarly, the typical white student's district spends 22 percent above estimated adequate levels, while funding is 17 percent below adequate in the average African American student's district and 11 percent below in the typical Latinx student's district.

Percent of students in underfunded districts by race and ethnicity, 2020



See Figure 19 for full graph.

In an ideal state finance system: 1) all districts’ funding would be adequate to achieve a given (and hopefully desirable) student outcome goal; 2) no districts would have substantially more adequate funding than any others; and 3) the state would devote a large enough share of its “economic pie” in state and local revenue to accomplish these goals.

Unfortunately, this ideal system—or a system that even resembles it—exists only hypothetically. A small handful of states do a reasonably good job of funding their schools adequately, and while educational opportunity is unequal in every single state, there are a few in which it is only moderately so. But there are no states with both adequate funding and even remotely equal opportunity. Making things worse, the typical state devotes a smaller share of its capacity to its schools than at any time in at least 15 years.

In ExecTable 1, we present a simplified summary of each state’s results on effort, statewide adequacy, and equal opportunity. For more detailed state-by-state results, [download the one-page profiles for each state.](#)

To be clear, these outcomes—statewide adequacy in particular—are influenced in part by factors that states do not control. For instance, there are several states, such as Arkansas, Mississippi, New Mexico, and South Carolina, which, despite their high effort levels, do not achieve widely adequate funding due to unusually high costs (e.g., high poverty) and low capacity (small economies from which to draw revenue).

In general, however, the performance of states’ K-12 finance systems, positive and negative, are due largely to deliberate policy choices on the part of state legislatures. Perhaps the most egregious examples are states such as Arizona, California, Florida, Idaho, Louisiana, Nevada, North Carolina, and Tennessee, in which both effort and adequacy are low; these states are effectively choosing to underfund large swaths of students. Yet, even in states where adequacy is generally (and laudably) high, many thousands of (disproportionately lower-income) students still fall through the cracks, and educational opportunity is typically severely unequal. These states are in many respects inequality factories, reproducing unequal student outcomes, year after year, by design.

The upside of the conclusion that performance is mostly within states’ control is that systems can be improved

EXEC TABLE 1

### Summary performance on three “core indicators” by state, 2020

	FISCAL EFFORT	STATEWIDE ADEQUACY	EQUAL OPPORTUNITY
AK	high	high	low
AL	medium	low	low
AR	high	low	low
AZ	low	low	medium
CA	low	low	low
CO	low	medium	low
CT	medium	high	severely low
DC	low	medium	n/a
DE	low	medium	low
FL	low	low	medium
GA	medium	low	low
HI	low	n/a	n/a
IA	medium	medium	severely low
ID	low	low	medium
IL	medium	medium	severely low
IN	low	medium	severely low
KS	high	medium	severely low
KY	medium	medium	low
LA	low	low	low
MA	low	high	severely low
MD	medium	medium	low
ME	high	high	severely low
MI	medium	medium	severely low
MN	medium	medium	severely low
MO	medium	medium	severely low
MS	high	low	low
MT	high	medium	low
NC	low	low	medium
ND	medium	high	medium
NE	medium	medium	low
NH	medium	high	severely low
NJ	high	high	severely low
NM	high	low	medium
NV	low	low	medium
NY	high	high	severely low
OH	high	medium	severely low
OK	medium	low	low
OR	high	medium	low
PA	high	medium	severely low
RI	high	medium	severely low
SC	high	low	low
SD	low	medium	low
TN	low	low	low
TX	medium	low	low
UT	low	medium	medium
VA	low	medium	low
VT	n/a	n/a	n/a
WA	medium	medium	severely low
WI	medium	medium	severely low
WV	high	medium	low
WY	high	high	severely low

Note: For definitions of categories see the backside of any state’s one-page school finance profile.

by better policy. Moreover, when such improvement is done properly—by targeting new revenue at underfunded districts—effort, adequacy, and equal opportunity can be increased simultaneously.

### RECOMMENDATIONS

This is a national report and states' systems vary dramatically “under the hood,” which means our recommendations are necessarily general. Yet there are basic, research-backed principles that should guide the design and improvement of all states' systems, and our results suggest that the vast majority of states (in some respects all states) are violating these principles. Here we offer a summary of our recommendations embodying these tenets:

**Better targeting of funding (especially state aid).** The backbone of any state finance system is its funding targets—i.e., reasonable calculations of how much funding each district needs to achieve a common desired outcome goal, given its student population and other contextual factors. If funding targets are not determined properly and rigorously, funding may appear adequate and equitable when it is not. As a first step, all states should “audit” their funding targets by comparing them with estimates from rigorous, outcome-based analyses (e.g., cost models) that account for student and district characteristics that influence costs. Once targets are in place, states should then allocate state aid such that all districts have what they need, minus a reasonable local contribution (based on the capacity of each district to produce local revenue).

**Increase funding to meet student needs where such funding is inadequate.** Note that the point here is not simply to increase funding. It is, rather, to ensure that funding is commensurate with costs/need. In states where funding is widely inadequate, this might include a substantial increase in local revenue from districts where such revenue is lower than would be expected based on capacity. In most states, however, the key is increasing state revenue (e.g., from state sales and income taxes, and/or from expanding tax bases by, for instance, state taxation of non-residential commercial property). And raising new revenue is particularly important in states where effort is medium or low (i.e., where there is capacity to boost investment). Were all states simply to return to their own pre-recession effort levels, this could make a large dent in the nation's adequate funding gaps.

**Distribute federal K-12 aid based on both need and effort.** The unfortunate truth is that many states with

widely inadequate funding have the economic capacity to address this issue by increasing K-12 revenue, whereas other states put forth relatively strong effort, but their costs are so high (e.g., high poverty student populations) and/or their economies are so small that they cannot meet their students' needs. For these latter states, federal education aid can serve as a vital bridge to more adequate and equitable funding. We recommend supplemental federal funds be targeted at districts with below adequate funding in states that are either paying their “fair shares” in state and local revenue (i.e., a reasonable minimum effort level) or demonstrate sufficient progress toward meeting this requirement.

**Enhance federal monitoring of school funding adequacy, equity, and efficiency.** We propose that the U.S. Department of Education establish a national effort to analyze the adequacy and equity of states' systems, and provide guidance to states as to how they might improve their systems. This would include estimation and publication of measures such as wage adjustment indices and compilations of nationally-normed outcome measures, annual estimates from cost models such as the one used in this report, and periodic (e.g., five-year) evaluations of adequacy and equity in states' finance systems. It should also include evaluations of the efficiency of state and local spending and of specific policies and practices on which new funding might be spent.

Our findings as a whole 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 (if not allocated in a manner that fosters equal opportunity). 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 heterogeneity 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. Our framework for evaluating states is based on these principles. 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.

# 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 (Baker 2017, 2018; Candelaria and Shores 2019; Jackson 2020; Jackson, Johnson, and Persico 2016; Jackson, Wigger, and Xiong 2021; Lafortune, Rothstein, and Schanzenbach 2018).

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), **statewide adequacy** (whether aggregate spending is enough to achieve common outcome goals), and **equal opportunity** (whether adequacy differs between higher- and lower-poverty districts). We refer to these as our “core indicators,” because 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. On average, about 90 percent of school funding comes from a combination of local and state revenues, with the remainder coming in the form of federal aid.

Local revenues, mostly from property taxes, are collected and distributed at the school district level, with states exerting substantial control over local revenue by defining the bounded geographic spaces of local districts, determining how taxable properties are valued and taxed, and deciding how those taxes are incorporated into the broader school finance system. State revenues, derived mostly from sales and income taxes, are “pooled” and distributed to districts via a statewide funding formula. The details of these formulas vary substantially from state to state, but they are designed, in theory, to accomplish two goals:

- **Account for differences in the costs of achieving equal educational opportunity across schools, districts, and the children they serve.** *Cost* refers to the amount of money a school district needs to meet a certain educational goal, such as a particular average score on a standardized test. Costs vary because student populations vary (e.g., some districts serve larger shares of disadvantaged students than others) and also because the economic and social characteristics of school districts vary (e.g., some districts are located in labor markets with higher costs of living than others). School funding formulas (should) attempt to account for these differences by driving additional funding to districts with higher costs.
- **Account for differences in fiscal capacity, or the ability of local public school districts to pay for the cost of educating their students.** In most states, school districts rely heavily on local property taxes to raise revenues. This advantages wealthier communities: Because their property values are higher, they can tax themselves at lower rates. School funding formulas attempt to compensate by directing more *state* aid to districts with less capacity to raise local revenues to meet their students' needs.

These two factors—district costs and local revenue-raising capacity—are strongly (but not perfectly) negatively

associated with each other. Districts with less local taxable wealth are also far more likely to serve higher concentrations of students in poverty, and child poverty is a major factor determining the cost of providing children with equal opportunity to achieve common outcome goals (Duncombe and Yinger 1998, 2000, 2005; Imazeki and Reschovsky 2004; Reschovsky and Imazeki 2000). For example, high-poverty districts often have to offer higher salaries to recruit and retain teachers (Hanushek, Kain, and Rivkin 2004; Lankford, Loeb, and Wyckoff 2002), while smaller classes have been shown to narrow outcome gaps between students from different backgrounds (Dynarski, Hyman, and Schanzenbach 2013; Konstantopoulos and Chung 2009).

In part for these reasons, many state courts have reaffirmed that their constitutions mandate statewide school funding systems that take these factors into account. That is, they require states to fill the gaps between districts' needs/costs and their ability to pay those costs with local revenue.

In a well-designed state school finance system, each district is assigned a target 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. The framework with which we evaluate states' systems is in large part designed to gauge these discrepancies between how levels and distribution of funding *should* look and how they *do* look.

### CONCEPTUAL FRAMEWORK

Our framework for evaluating the K-12 finance systems of all 50 states and the District of Columbia begins with two basic premises, both discussed above:

- 1a.** Higher student outcomes require more resources; and
- 1b.** The cost of achieving a given outcome varies by context.

The importance of context (1b) is critical to 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.

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 if it 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 (i.e., to achieve a common student outcome or outcomes). 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.

That said, it follows directly from these first two tenets that the key question in evaluating finance systems is not just how much states or districts spend but, perhaps more important, whether it is *enough*—i.e., whether resources are adequate.

Our second set of principles pertains to how we define "adequacy." Since the core purpose of public schools is to educate and prepare all students:

- 2a.** We define adequacy as the cost of achieving student outcome goals; and
- 2b.** We estimate costs in all states and districts with reference to the *same* outcome goals—for instance, funding should not be adequate to achieve high outcomes in one state or district and adequate to achieve more modest goals in another.

With regard to 2b, we of course recognize that states vary in terms of their academic standards and/or in the outcome goals that their finance systems are (at least in theory) expected to produce. Our purpose, however, is to evaluate all states' systems in a comparable manner, and doing so requires common outcome goals, such as a given score on standardized math and reading tests, within and between states. This means that estimated adequate spending levels will vary by district (see 1b),

but those levels are all based on the same “benchmark” outcome goals.

Our third principle is in most respects methodological, but it is worth stating directly:

3. The most appropriate approach to estimating costs across thousands of heterogeneous districts serving millions of diverse students is to use statistical cost models (education cost function).

We elaborate on our model in detail below, but for now the relevant point is that we prefer this approach not only because cost modeling has been used extensively in peer-reviewed studies of education costs and cost variation (Downes 2004; Duncombe and Yinger 1997, 1998, 1999, 2000, 2005, 2007; Imazeki and Reschovsky

2004), but also because common alternative approaches, such as “professional judgment panels” or more ad hoc costing studies, are both implausible and ill-equipped for national evaluations (indeed, we would argue they are, *by themselves*, insufficient for setting funding targets even within individual states).

Insofar as the primary goal of any state finance system is to provide all students with an equal shot at achieving common outcomes, we use cost models to evaluate states on two adequacy-focused “dimensions” or measures, which represent two of our three core indicators. They are the degree to which states:

- 4a. Provide all students with enough funding to achieve a common (and hopefully desirable)

BOX 1

**Defining concepts: Equal educational opportunity and adequacy**

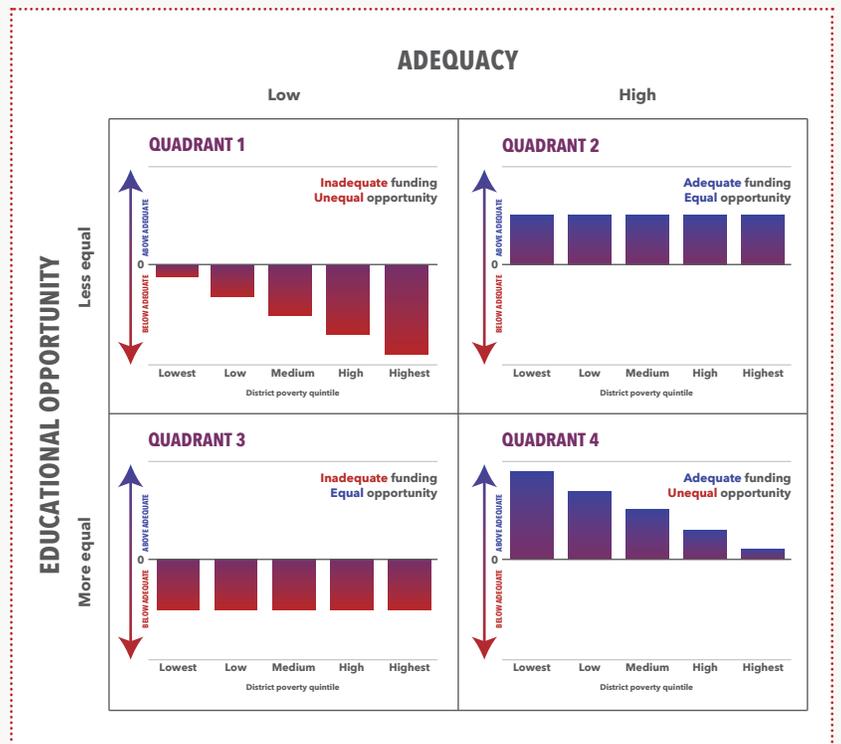
**Equal educational opportunity** exists when all districts’ resources are either above or below target levels by approximately the same proportional amount. These target levels can theoretically be determined in any manner, and may or may not vary by district, so long as all districts’ actual resources are approximately the same “distance” away from them. In other words, equal opportunity does not depend on how or where one sets the adequacy “bar.” Conversely, *unequal* opportunity gaps are typically found between groups defined by characteristics such as poverty and race/ethnicity.

**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 are far above the targets, and some are 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 (see quadrant 2 in the figure).

It is important to note that adequacy and equal opportunity are independent concepts. This means that *equal opportunity can be preserved even when resources are inadequate*. This would be the case, for example, if all districts’ resources were inadequate by roughly the same proportions (quadrant 1). 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 (see quadrant 4). 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). Finally, of course, inadequate funding and unequal opportunity often co-exist, with funding below target levels in the vast majority of districts but more inadequate in some districts than in others (quadrant 3).



- outcome goal (i.e., **statewide adequacy**); and
- 4b.** Ensure that no students have a greater chance of achieving those goals than do their peers elsewhere in the state (i.e., **equal opportunity**).

It is very important to note that these two measures—statewide adequacy and equal opportunity—are conceptually independent (see Box 1). That is, one can exist without the other. There may, for example, be states in which large majorities of students attend districts with funding above estimated adequate levels (i.e., high statewide adequacy), but in which funding is far above adequate levels in some districts and just barely above in others (unequal opportunity). Conversely, states can exhibit very low adequacy but still maintain equal opportunity, if all districts are generally the same “distance” away from (in this case, below) their target funding levels.

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.<sup>1</sup> Absent both, however, states can be evaluated on each dimension separately.

The final element of our framework for evaluating states’ K-12 finance systems is designed to account for the aforementioned fact that both costs and the ability to pay those costs differ between states. Our fifth principle, therefore, is the basis for our third and final “core indicator,” and it is:

- 5.** States should also be evaluated on how much of their economic capacity—i.e., their ability to raise revenue—is devoted to their public schools (i.e., **fiscal effort**).

Some states’ economies are so small relative to their students’ needs that they are essentially unable to raise enough revenue to fund their schools adequately, whereas other states simply refuse to provide sufficient resources despite having the option to do so. Including effort in our framework allows us to differentiate the former from the latter.

## DATA AND EMPIRICAL APPROACH

We evaluate state finance systems—on the three “core indicators” of fiscal effort, statewide adequacy, and

equal opportunity—using data from the **School Finance Indicators Database** (SFID), a set of public data and resources on state and local school finance. 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 (Baker, Di Carlo, Weber, et al. 2022b). Due to the lag in the release of federal school finance data, the new release of the SID accompanying this report includes data up to the 2019-20 school year, but many of our measures go as far back as 1993.

Given the importance of context in estimating education costs (see above), most of the measures in the SID, including those presented in this report (see Appendix Table A1, which includes proper citations for these and other sources), 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);
- 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);
- 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-

<sup>1</sup> To be clear, the goal of achieving both equal opportunity and adequate funding is an idealized goal. In this report, we evaluate adequacy (and, by extension, equal opportunity) using averages across states and within states by district poverty quintile (the district-level adequacy estimates that are used to construct all measures are available at the School Finance Indicators Database website: [schoolfinancedata.org](http://schoolfinancedata.org)). In practice, it is highly unlikely that any state would ever exhibit perfectly equal opportunity. In other words, at any given adequacy “bar” (e.g., national average outcomes), equal opportunity is really a matter of degree, rather than an absolute “yes/no” outcome.

needs student populations (Duncombe and Yinger 2007). 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.)

Finally, some of the results we present in this report are calculated using the SFID's District Cost Database (DCD) (Baker, Di Carlo, Weber, et al. 2022a). Whereas the SID presents state-level finance measures, the DCD is a district-level dataset of spending, estimated costs (i.e., adequate funding levels), and several contextual variables for more than 12,000 districts between 2009 and 2020 (the current version of the DCD goes up to 2019, but the updated estimates used in this report will be released in early 2023). The adequacy estimates in the SID are simply aggregations of DCD estimates, but some of the results presented below are not part of and/or cannot be calculated directly using the SID.

We will discuss each of our three “core indicators” of fiscal effort, statewide adequacy, and equal opportunity in greater depth below, including the data and models used to calculate them. All SFID data, as well as documentation, data visualizations, and other products, are available at the SFID website: <http://schoolfinancedata.org>.

### SCHOOL FUNDING AND THE PANDEMIC

Finally, events over the past two to three years merit a brief mention. 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 downturn (Baker and Di Carlo 2020). The outlook, mercifully, has improved a great deal. As of late 2022, most states are reporting at least fairly strong fiscal conditions and minimal budget cuts (NASBO 2022). Moreover, thanks to timely federal aid and a relatively quick recovery, the pandemic did not create the massive damage that was expected in 2020 and 2021. While there is still a substantial amount of uncertainty, including the condition of budgets when federal aid runs out over the next few years, public schools seem to have mostly dodged a massive bullet.

In any case, the latest data in this report pertain to the 2019-20 school year, a time period that includes the earliest months of the pandemic. Given the cycle of K-12 budgeting, however, our data would be unlikely to reflect any discernible impact of budget cuts even if they had occurred. (The pandemic did affect our effort estimates, as discussed below.)

Similarly, our data do not yet reflect the emergency federal pandemic aid that was distributed starting in 2020. Yet we do not anticipate that these additional federal funds, even when they do “appear” in our data, will have a large impact on our statewide adequacy and equal opportunity results (and none at all in the case of fiscal effort, which includes only state and local funding). Although the overall amount of this aid is large, the funding is spread out over multiple years and does not amount to a large proportional increase at the district level in any given year. And, of course, any discernible impact would most likely be temporary, as the additional federal funds will run out.

The issue of how these funds were spent is currently receiving a great deal of attention, but this is not a question our system is built to address even when data become available. This is, most basically, because our focus is on adequacy and equity of spending *overall*. Our framework, particularly our adequacy estimates, can be useful in examining the efficiency of state and district spending, but not *why* such funding was or was not efficient (i.e., how the money was spent and the impact on outcomes).

That said, the release of recent national testing data suggests that the pandemic had a rather severe negative impact on the testing performance of the current cohort of U.S. students, particularly disadvantaged and struggling (lower-scoring) students (National Center for Education Statistics 2022). We would suggest that one major reason why students in higher-poverty districts bore the brunt of the ill effects—as well as why they were so far behind even before the pandemic—is the vast differences in the adequacy of resources between these districts and their more affluent counterparts. In addition, we contend that gaining back some of the ground these students have lost will require fundamental changes in the levels and distribution of K-12 funding.

# RESULTS

In this section, we report results for our three core indicators of fiscal effort, statewide adequacy and equal opportunity. 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 2020 in order to characterize the "current state" of K-12 school finance, as well as, where appropriate, trends to show how that situation has changed over time.

We describe our three core indicators in greater depth within their respective sections (and data sources are available in Appendix Table A1), 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. **Statewide adequacy:** the degree to which states, *on the whole*, provide sufficient resources relative to common outcome goals (e.g., national average test scores); and
3. **Equal opportunity:** whether funding is more adequate (or less inadequate) in some districts than others, particularly between higher- and lower-poverty districts.

Note that, throughout this report, individual *years refer to the spring semester of that school year*. For example, 2020 means that the data pertain to the 2019-20 school year (the most recent year available).

## FISCAL EFFORT

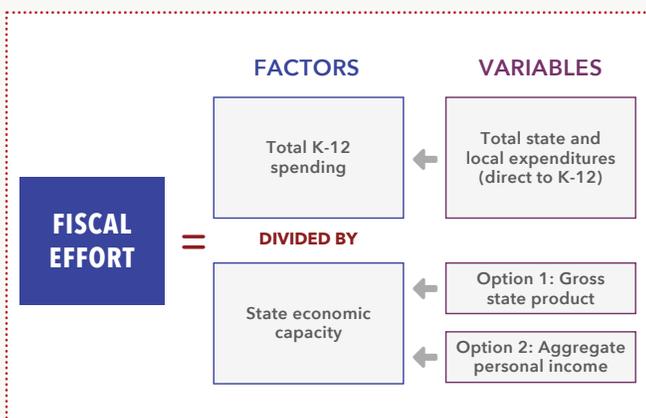
Fiscal effort (or simply "effort") measures how much of a state's total resources are spent directly on K-12 education. In our system, effort is calculated by dividing total expenditures (state plus local, direct to K-12 education) by either gross state product (GSP) or aggregate state personal income.

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 (i.e., education budget as a percentage of the total budget). We believe this is problematic, however, because some states choose not to levy sufficient taxes to support any high-quality public services. These states may devote 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. Our measures 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 invest more.

FIGURE 1

### State fiscal effort measure



### FISCAL EFFORT BY STATE IN 2020

In Figure 2, we present a map of each state's effort (spending as a percentage of its gross state product) in 2020, 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. Bear in mind, however, that there are a couple of states, such as New

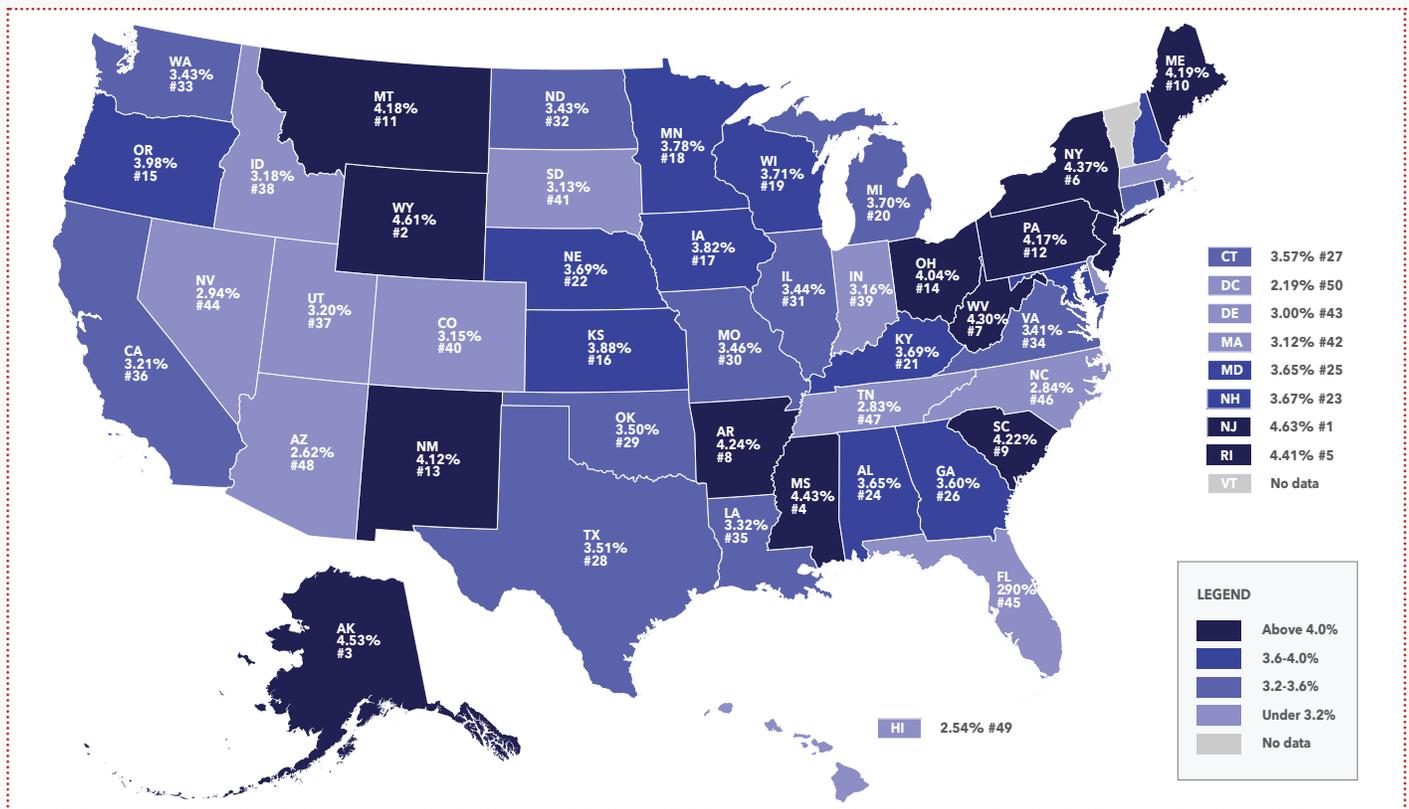
York and Delaware that perform better (relative to other states) on personal income-based effort than they do on GSP-based effort. This is due to these states' large financial sectors, which increase their GSPs, the denominator of the effort "equation."

There is a similar, even more drastic discrepancy in the case of effort in the District of Columbia (D.C.), which we are reporting for the first time this year. GSP-based effort in D.C. is the lowest in the nation (around 2.2 percent)

but it is among the nation's highest as a proportion of personal income (5.3 percent). In general, D.C.'s uniqueness—e.g., the presence of the federal government—renders its GSP-based effort level largely incomparable with those of other states. We choose to report effort for D.C. this year because there is value in examining trends in its effort level, but we exclude D.C. from some effort-related analyses (and discussion) in this report.<sup>2</sup> Note, finally, that the data are missing (gray shading in the map) for Vermont due to data irregularities.

**FIGURE 2**  
**State fiscal effort**

Total state and local expenditures (direct to K-12) as a percentage of gross state product, by state, 2020



Note: Effort in the District of Columbia should be interpreted with caution, and should not be compared with that in other states (see text for more discussion). Effort is not available for Vermont. Ranks may reflect differences concealed by rounding.

DATA SOURCE: SCHOOL FINANCE INDICATORS DATABASE



That said, Figure 2 indicates that effort ranges from approximately 2.5 to 2.6 percent in Hawaii and Arizona to around 4.6 percent in New Jersey. In other words, the amount New Jersey spends directly on its schools is equal to 4.6 percent of its annual GSP, while Arizona and

Hawaii spends roughly half as much as a proportion of their GSPs. If Hawaii and Arizona were to increase their effort levels to that of New Jersey, direct state and local K-12 spending in those states would increase about 75-80 percent.

<sup>2</sup> These issues with effort in D.C. might be addressed by relying on personal income-based rather than GSP-based effort. We focus on the latter because we feel it does a somewhat better job capturing states' revenue-raising capacity, and we do not present both versions of the effort indicator in this report to avoid the confusion and clutter that replicating all analyses would cause, costs that would be incurred in exchange for more appropriate results for one "state." Again, though, readers interested in results for the personal income-based effort indicator, whether in D.C. or in any other state, can access these data at the SFID website.

Most states are clustered within 0.5 percentage points of the unweighted U.S. average of 3.61 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 1 percentage point) 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 (in this case, GSPs) 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 3, which is a scatterplot of effort and gross state product per capita in 2020 (the latter is

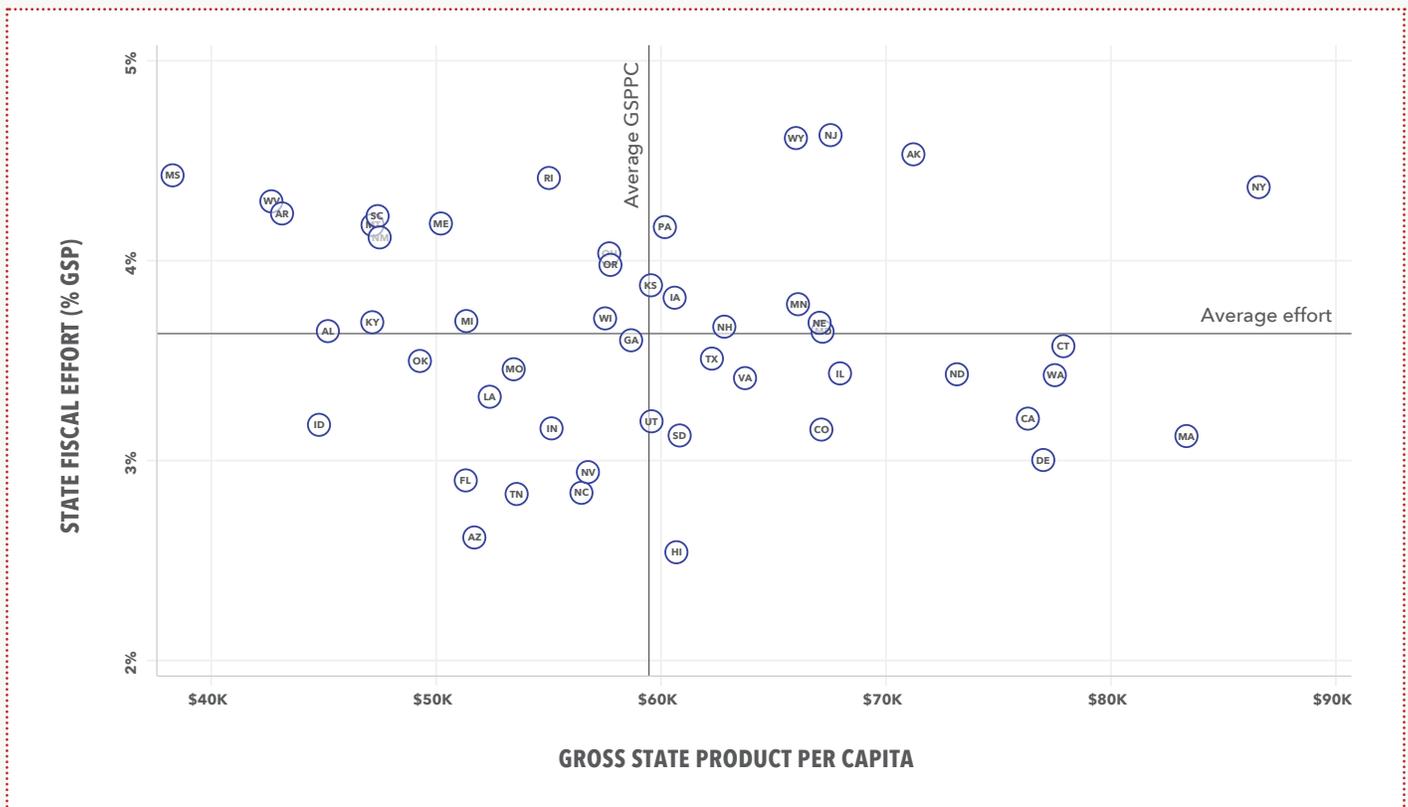
our state economic capacity measure, GSP, divided by state population for the purposes of this figure). The District of Columbia is excluded from this plot. Overall, the state markers in the plot exhibit no consistent pattern (the correlation coefficient is -0.11).

New York and New Jersey, for instance, are high-capacity states that also put forth above-average effort (the upper-right area of Figure 3), generating copious resources statewide. But there are also a number of states, such as 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, but they also suggest that these lower-effort states are not tapping their revenue-raising potential, which would be a problem if funding were widely inadequate in these states (we will return to this issue below).

FIGURE 3

### 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, 2020



Note: Averages (lines in the plot) are unweighted. Graph does not include Vermont (effort not available) or the District of Columbia (effort and GSP per capita not comparable with other states').

DATA SOURCE: SCHOOL FINANCE INDICATORS DATABASE

In contrast, several states in the upper-left quadrant of the plot, such as Arkansas, Mississippi, 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, another 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 total funding.

**U.S. AVERAGE EFFORT TREND, 2006-2020**

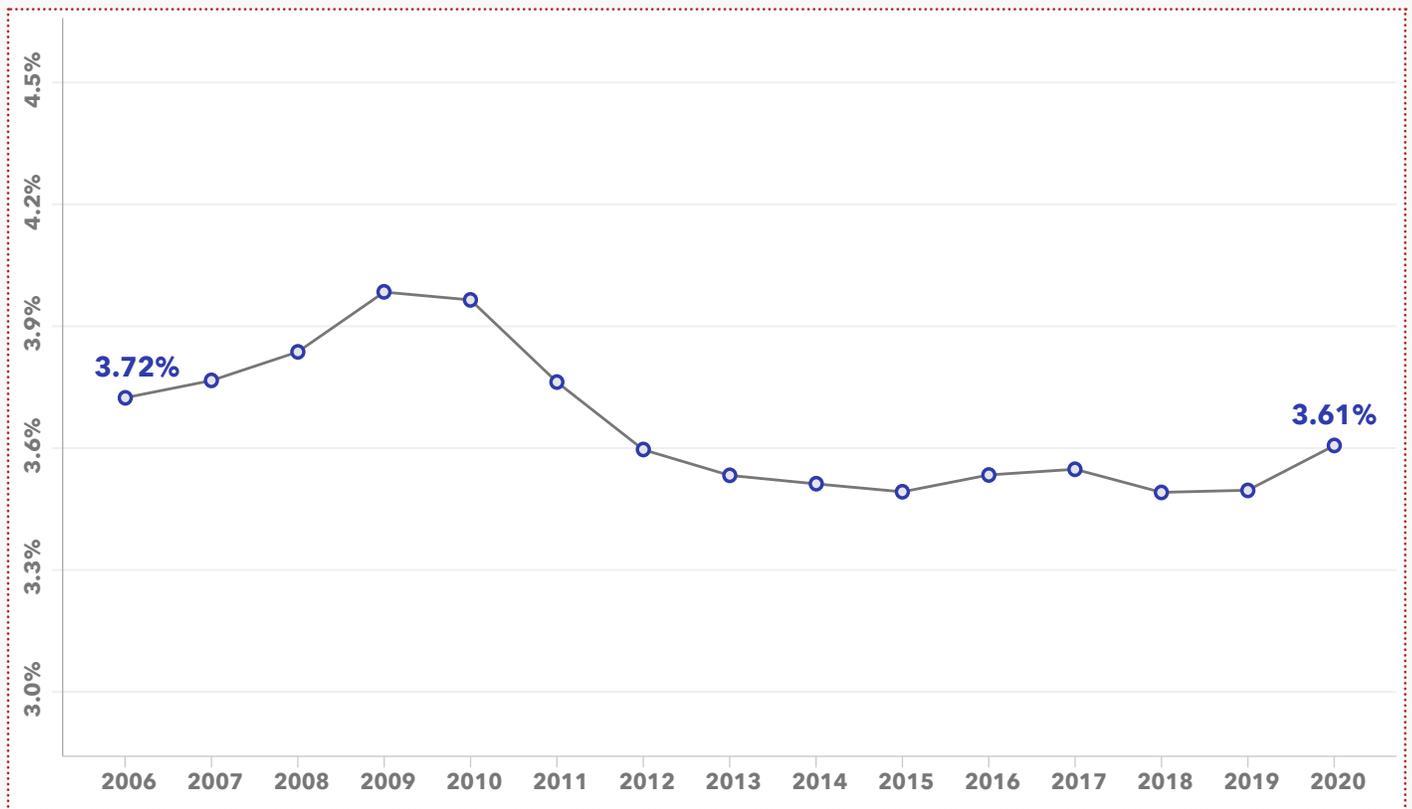
States’ fiscal effort levels can vary year to year due to changes in their education funding policies, their over-all economies (e.g., GSP) or both. Figure 4 presents the national trend in (GSP-based) effort between 2006 and 2020.<sup>3</sup> Once again, the averages in all years do not include Vermont, which 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 D.C., 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 iden-

FIGURE 4

**National fiscal effort trend**

Total state and local expenditures (direct to K-12 education) as a percentage of gross state product, U.S. average, 2006-2020



Note: Averages are unweighted and do not include Vermont.

DATA SOURCE: SCHOOL FINANCE INDICATORS DATABASE



<sup>3</sup> The trend presented in Figure 4 begins in 2006 because the quarterly GSP estimates that we use for the effort denominator begin in 2005 (Bureau of Economic Analysis 2022). Regular readers of this annual report may notice that the trends presented in previous editions went back further in time. This is because we switched to using the quarterly rather than the annual GSP estimates this year (for both the personal income- and GSP-based effort indicators), and the annual GSP estimates go back further than the quarterly data. For example, 2020 GSP is constituted by the final two quarters of 2019 and the first two quarters of 2020. This allows for a better “match” of the effort denominator with its numerator (which is based on the school year).

tical). Note that the range of the vertical y-axis in Figure 4 is 3.0-4.5 percent; year-to-year changes would look more or less steep with different scaling.

Fiscal effort seems quite volatile over this time period. 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. 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.

Between 2007 and 2009, a time period that includes most of the duration of the “official” recession, effort increased at least somewhat in 40 states, with the remainder essentially flat or seeing only very modest increases. The situation changed dramatically around 2009, as states’ economies began to recover while state and local budget cuts began to take effect. Average effort decreased sharply between 2009 and 2013, going from 4.0 to 3.53, with at least a nominal net decrease during this time in every state except Delaware and Wyoming (where it was essentially unchanged) and the District of Columbia. 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 2020, when our data end, effort in the typical state remained mostly flat, with the exception of a fairly large jump between 2019 and 2020. Even this increase, however, was likely also an “illusion”—much like that which occurred between 2007 and 2009—and it does not reflect a concurrent increase in educational investment.

During the first two quarters of 2020, the pandemic caused rather severe contractions of most states’ economies (due to unemployment, shuttering and closing of businesses, etc.). This decrease in the effort denominator, along with comparatively flat state and local education spending, generated at least a nominal increase in effort in all but five states. It is a good bet that the 2019-20 increase will flatten back out nearer to its previous levels during 2021 and 2022.

Even with this 2019-20 increase, the U.S. average effort level was still lower in 2020 than at any point in nearly a decade, and 2020 effort was higher than it was in 2006 in only 18 states, typically by modest margins. In some states, the declines are alarming. The net change between 2006 and 2020 was greater than -0.5 percentage points (one-half of 1 percentage point) in seven states, including Hawaii (-0.73), Indiana (-0.69), and Florida (-0.67).

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, Masterson, and Figueroa 2017). The failure to restore this funding fully, even after more than a decade, has left schools in many states operating with barely more or even less state and local funding 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’ K-12 effort levels are difficult to overstate. The changes in U.S. average effort discussed above may appear small—fractions of 1 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” spending in recent years at states’ *pre-recession* effort levels. For instance, we might ask: How much higher would total spending have been between 2016 and 2020 had all states recovered to their own pre-recession (2006) effort levels by 2016? This “thought experiment” entails simply multiplying each state’s 2006 effort level by its gross state product in

each year between 2016 and 2020, and comparing those amounts with actual total state and local spending.

In Figure 5, we present the percentage difference between this “simulated” 2016-20 state and local spending (i.e., at 2006 effort levels) and actual spending across those years, by state. The bars in the figure represent how much higher total 2016-20 spending would be had each state returned to its own 2006 effort levels by 2016 (and stayed at that level until 2020). If effort was higher in any year between 2016 and 2020 than it was in 2006, the “simulated” increase in that year is zero. There are, in fact, seven states in which effort was higher in every year between 2016 and 2020 than it was in 2006 (Alaska, Connecticut, District of Columbia, Louisiana, Minnesota, Nebraska, and Wyoming); the bars for these states, of course, are zero (Oregon’s bar also rounds to 0.0 percent but it is 0.04 percent). It bears noting that three of these states (Alaska, Louisiana, and Wyoming) receive significant (and volatile) revenue from severance taxes (e.g., taxes on oil and gas production).

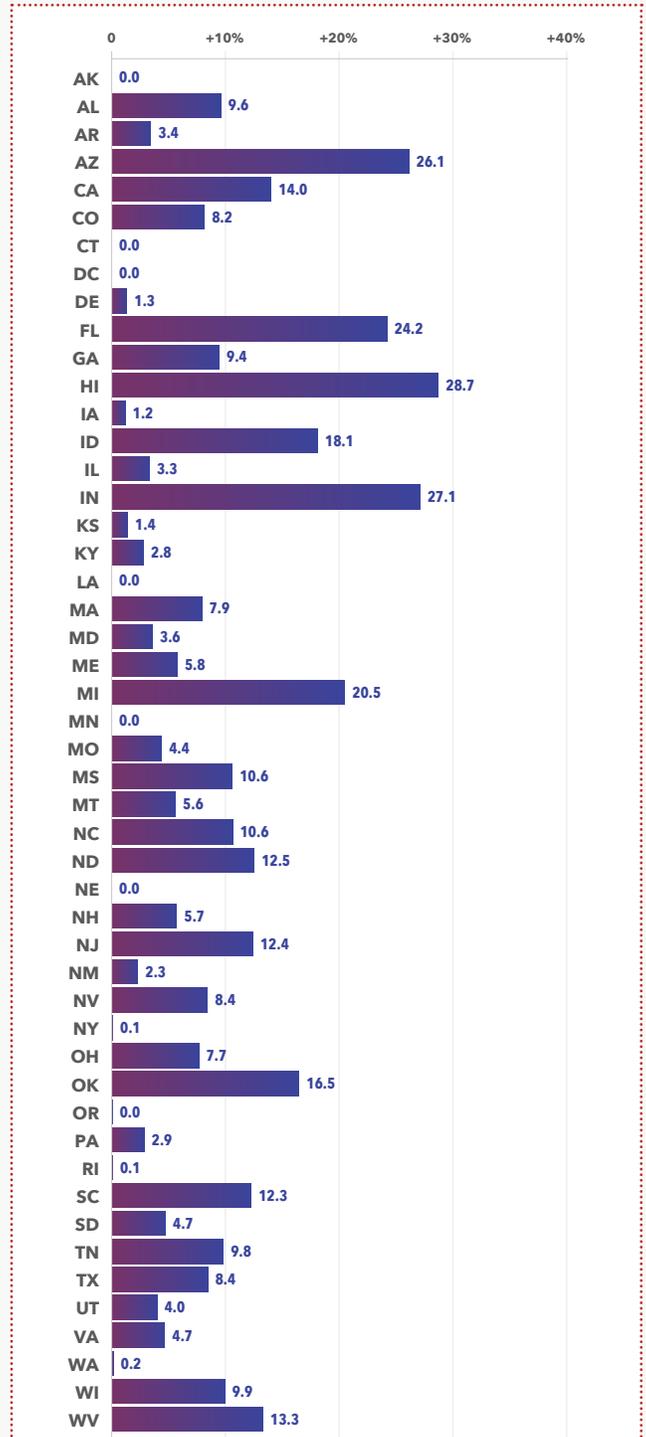
Across all states (Vermont is once again excluded from this exercise), the total amount of “lost” state and local funding between 2016 and 2020 is \$288 billion. This is equivalent to 8.4 percent of total funding during this time period. In 32 states, effort was lower in all five years between 2016 and 2020 than it was in 2006.

The differences in Figure 5 are quite shocking in several states. For instance, at their 2006 effort levels, total 2016-20 state and local funding would have been at least 20 percent higher in Hawaii (28.7 percent), Indiana (27.1), and Arizona (26.1), Florida (24.2), and Michigan (20.5). These are enormous differences (and funding would have been at least 10 percent higher in eight additional states). So long as the typical state’s effort level remains at what seems to be its new (lower) equilibrium, this counterfactual “price tag” will continue to accumulate.

FIGURE 5

### Change in 2016-20 K-12 spending under 2006 effort levels

Percent difference between “simulated” total 2016-20 K-12 spending and actual 2016-20 spending, by state



Note: See text for details on calculation. Graph does not include Vermont (effort not available).

DATA SOURCE: SCHOOL FINANCE INDICATORS DATABASE

## STATEWIDE ADEQUACY

Our adequacy estimates are the centerpiece of this report (and of the SFID system in general). We use them in the calculation of two of our three core indicators (state-wide adequacy, discussed here, and equal opportunity, discussed below). In both cases, their importance for our framework stems from the fact that they can help us compare funding, within and between 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 both for researchers and for 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 above, 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.<sup>4</sup> From this perspective, rigorous adequacy measures can serve as guides for constructing, improving, and evaluating state systems. The target cost estimates represent imperfect but reasonable foundation levels of resources that each district needs to provide a particular 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 ESTIMATES

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

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. We call these latter estimates “adequate spending,” “required spending,” or “cost targets” interchangeably. In short, the model generates district-level estimates of adequate spending, which we aggregate (weighted by enrollment) to the state (used to evaluate statewide adequacy) and state/poverty group levels (used in the assessment of equal opportunity); we then compare them with actual spending levels (also aggregated). We describe the NECM in general terms directly below; for more details, see Baker, Weber, and Srikanth (2021).<sup>5</sup>

In our context here, the term “cost” is the amount of funding necessary for a school district to meet a stated educational outcome. The NECM estimates this cost using a national database of school district finance data in combination with data on student and district characteristics. These data are matched with outcome data: specifically, test scores in reading and math for students in grades 3-8 that have been statistically transformed to make them comparable across all states (Reardon et al. 2021). The model determines how student population characteristics (percentage in poverty, percentage of English language learners, percentage of students with disabilities, etc.) and district characteristics (relative wage costs, enrollment size, grade-level enrollments, etc.) affect student outcomes, and how much estimated funding is needed to reach a specified goal given these variations.

<sup>4</sup> Researchers (and policymakers) have used a variety of different approaches to estimate 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).

<sup>5</sup> In addition to the SFID’s district-level dataset of finance, student characteristics, and other variables (some of which are summarized in Appendix Table A1), 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 2014; Taylor et al. 2006). 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 2018). 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.

A problem with cost modeling in education finance is that outcomes and spending have a circular, or *endogenous*, relationship. Greater spending leads to better educational outcomes; however, better outcomes can lead to greater spending, as higher test scores can manifest in higher property values, increasing a community’s tax capacity and, therefore, its ability to spend on its schools (Figlio and Lucas 2004; Nguyen-Hoang and Yinger 2011). The NECM draws on previous work in education cost modeling to address this problem through econometric methods.

The common student outcome goal we have chosen is *relatively modest*: national average outcomes in reading and math. Because this goal is based on an average, many students, by definition, will not achieve it. This outcome standard could, of course, be raised or lowered; however, changes in the outcome would necessarily change the amount of spending necessary to achieve that outcome (e.g., raising the “bar” would increase the prevalence and severity of inadequate funding). We choose to focus (mostly) on the national average as it is a goal that is meaningful and reasonably attainable for all or most districts. In addition, using a modest goal allows us to identify with more confidence states and districts in which funding is inadequate by any reasonable standard, which is our primary concern.

It is important to interpret DCD estimates with caution. Even if we had a way to calculate perfect estimates of education costs, we would certainly never imply that these spending levels, if put into place in a given state or

district, would quickly and certainly raise scores to the national average. This is not only because that implication assumes efficient use of additional funds, but also because real improvement is gradual and requires sustained investment.

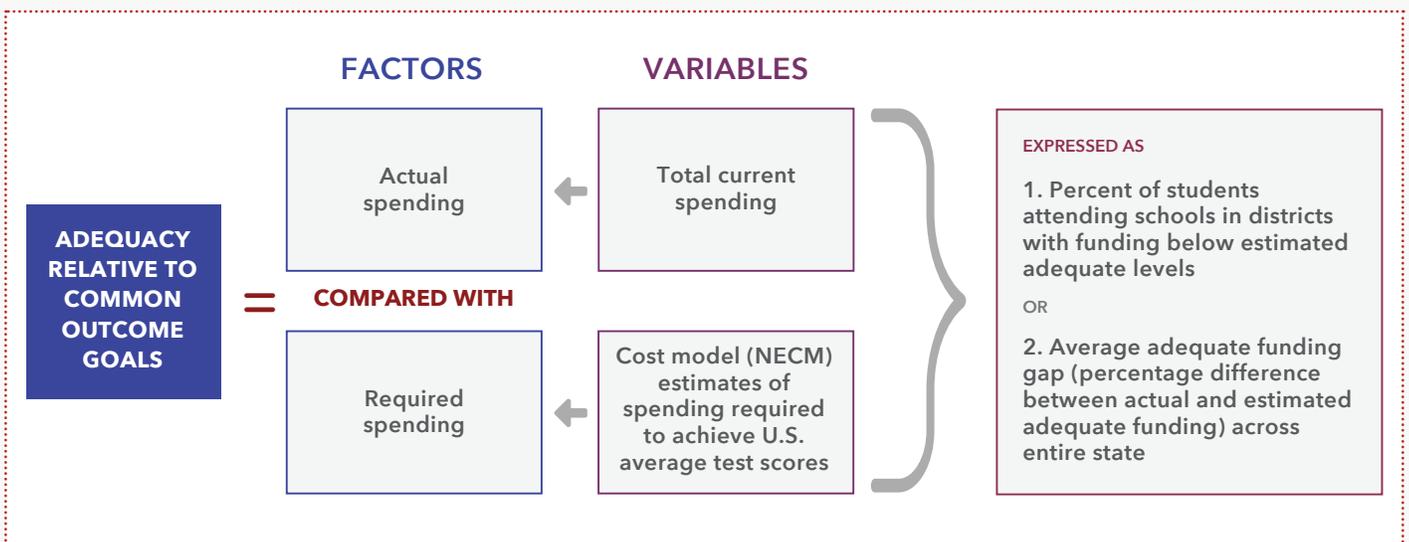
And, of course, our estimates are far from perfect; they are, indeed, estimates. This is true of all cost models, but the NECM contends with particularly daunting challenges insofar as it is estimating education costs across the entire nation. First and most basically, no model can control for everything (researchers call this “omitted variable bias”). The NECM includes numerous variables that influence the (bi-directional) relationship between funding and student outcomes, but there are unobserved (i.e., unmeasured or unmeasurable) factors that we cannot include. And estimating costs across all states exacerbates this problem (e.g., comparing costs between, say, Connecticut and Mississippi).

Districts certainly have characteristics that are not captured by our model but that affect spending, which would require them to spend more or less than the target to meet the outcome goals. Some districts may also choose to spend revenues on beneficial educational programs that may not affect test scores (sports, the arts, counseling services, etc.), whereas others may, in fact, engage in practices that make them more fiscally efficient or inefficient than others.

Second, the variables that we *do* have are imprecise. For example, our spending data may be biased by differences

FIGURE 6

Statewide adequacy measure



between states in how spending is tracked and reported to federal agencies (despite the best efforts of the latter). We have specific concerns about recent federal spending data from Vermont (which is excluded) and New York (including New York City), and about testing outcome data in western and upstate New York.

Third, although we define adequacy in terms of testing outcomes, this 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.

Despite these caveats, the spending targets we use herein are reasonable estimates, based on actual data, of the cost of achieving a basic level of equal educational opportunity across all school districts. As such, they are useful for our current goal: evaluating (and hopefully improving) state school finance systems.

#### OVERVIEW OF STATEWIDE ADEQUACY IN 2020

We evaluate statewide adequacy by expressing our adequacy estimates in two different ways. The first is each state's adequacy gap as a percentage—that is, the percentage difference between actual and required/adequate spending across the whole state. This can be interpreted as the “adequacy situation” for the *typical student* in each state, as it compares the weighted (by enrollment) averages of actual and required/adequate spending across all districts in that state.

The second measure we use to assess statewide adequacy is the percentage of students in each state who attend schools in districts with funding below estimated adequate levels. This is simply the number of students in such underfunded districts divided by total enrollment (across all districts for which we have valid adequacy estimates, which together serve about 95 percent of all K-12 public school students in these states).

These two measures, which we shall refer to as “adequate funding gaps” and “percent underfunded,” are highly correlated (technically, they are negatively correlated). This makes sense because they are both gauging the same basic thing: statewide funding adequacy. But they also provide some useful insights on their own, as we'll see.

In Figure 7, we present adequate funding gaps in 48 U.S. states in 2020.<sup>6</sup> Again, the figures in the graph represent the percentage difference between actual and required/adequate spending across each state (the “adequacy situation” for the typical student), with positive percentages indicating funding above adequate levels and negative numbers representing actual funding below adequate levels. We would reiterate, once again, that our adequacy bar here—national average student testing outcomes in reading and math—is a rather modest goal. When reviewing the results in this section, therefore, including those in Figure 7, it is most useful to evaluate states *relative to each other* rather than by some absolute standard.<sup>7</sup> For instance, states with positive percentages in Figure 7 should not be interpreted as those with adequate funding, but rather *more adequate* funding. Given the modest common outcome goal here, however, we would assert that states in which percentages are large and negative in Figure 7 could plausibly be viewed as providing inadequate funding, at least for the typical student.

One more quick (and related) point before discussing Figure 7: If the typical student's funding is above estimated adequate levels, this most certainly does not mean that *all* students in that state enjoy above adequate funding. And, conversely, negative percentages in Figure 7 do not mean that all students' districts are below adequate. These are statewide averages, and they mask underlying variation (which we will assess directly when we discuss equal opportunity).

That said, we find tremendous *interstate* variation in funding gaps in 2020, ranging from -37 percent in Mississippi (the typical Mississippi student's district spends 37 percent below estimated adequate levels) to +123 percent in natural resource-rich Wyoming (the average Wyoming student's district spends well over twice the

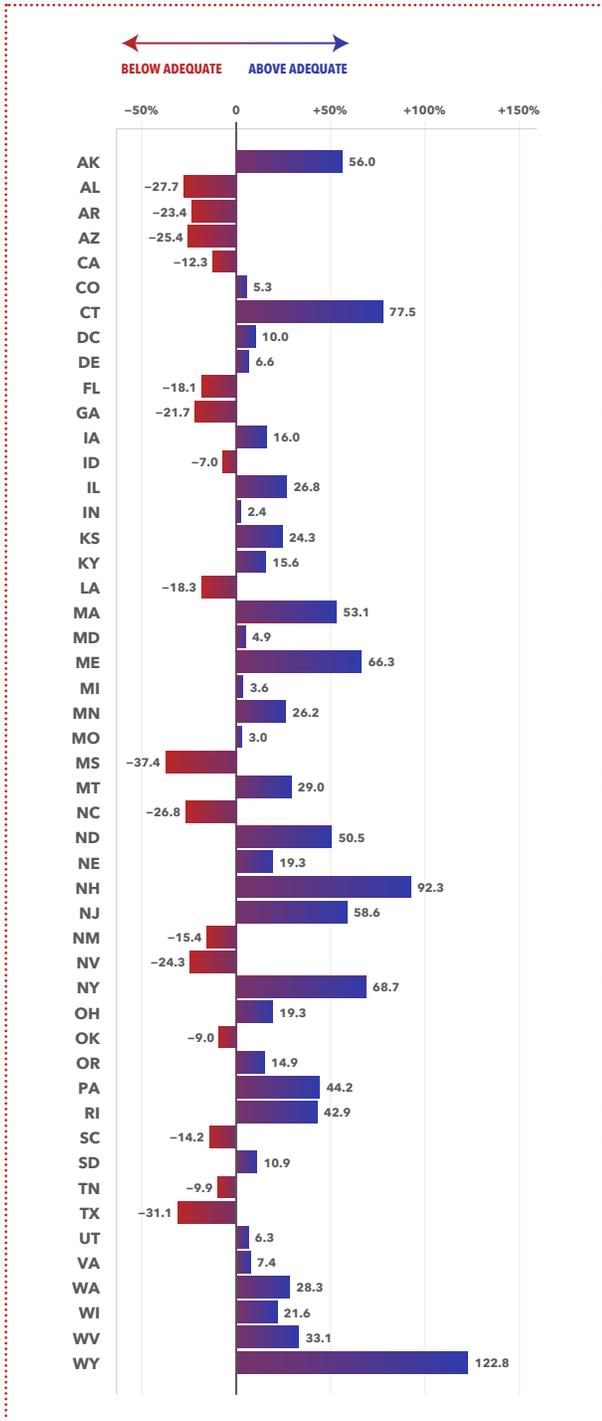
<sup>6</sup>The national averages presented in this graph (and in all graphs that present our adequacy estimates) exclude Hawaii and Vermont. Hawaii is always excluded from the NECM, as the state consists of a single, geographically isolated school district (the state does have independently operated 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). Estimates for Vermont, though available from 2009 to 2016, are not available between 2017 and 2020 due to irregularities in that state's data.

<sup>7</sup>Consider, for example, that using national average outcomes as the adequacy “bar” in our model essentially constrains the national weighted average funding gap to be roughly zero in any given year. The spread of districts (and states) around zero, however, might be wide or narrow, depending on how much variation there is in funding adequacy. Note also that this mechanical feature of the model is why we don't present national trends in statewide adequacy, as they would be roughly zero (or 50 percent in the case of percent underfunded) in every year.

FIGURE 7

### Statewide spending adequacy

Percent difference between actual and estimated spending required to achieve national average testing outcomes, by state, 2020



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

DATA SOURCE: SCHOOL FINANCE INDICATORS DATABASE



estimated required amount per pupil). There are 16 states in Figure 7 in which statewide funding is below adequate, including over 20 percent below in Georgia (-22 percent), Arkansas (-23), Nevada (-24), Arizona (-25), North Carolina (-27), Alabama (-28), Texas (-31), and the aforementioned Mississippi (-37).

In contrast, several states, such as Wyoming (+123 percent), New Hampshire (+92), and Connecticut (+78), exhibit large positive gaps. As we’ll see when we present the results for equal opportunity, the magnitude of these estimates is often driven by more affluent districts, which mask negative gaps among higher-poverty districts.

Figure 7 overall illustrates the incredible variation between states in the overall adequacy of K-12 funding. Such large discrepancies are also evident in Figure 8, which presents the percentage of students in districts with below adequate funding, by state.

The probability of a student attending school in a district with funding below estimated adequate levels varies from zero in Wyoming to around 90 percent in Arizona, Florida, Mississippi, Nevada, North Carolina, and Texas.

As stated above, our percent underfunded measure is highly correlated with the adequate funding gaps presented in Figure 7. Interestingly, the percent underfunded measure in Figure 8 assumes a far less normal distribution, with only two states (Oklahoma and Tennessee) having estimates between 40 and 69 percent (the national average, by design, is roughly 50 percent). Put simply, states’ percentages tend to be either relatively high or relatively low, with few states in the middle.

It also bears quickly mentioning that D.C.’s zero percent underfunded figure is, of course, an artifact of it being a “state” that consists of a single (government-run) district. That district (District of Columbia Public Schools) spends moderately above estimated adequate levels, but it serves all the students in our sample, generating a zero percent underfunded result.<sup>8</sup>

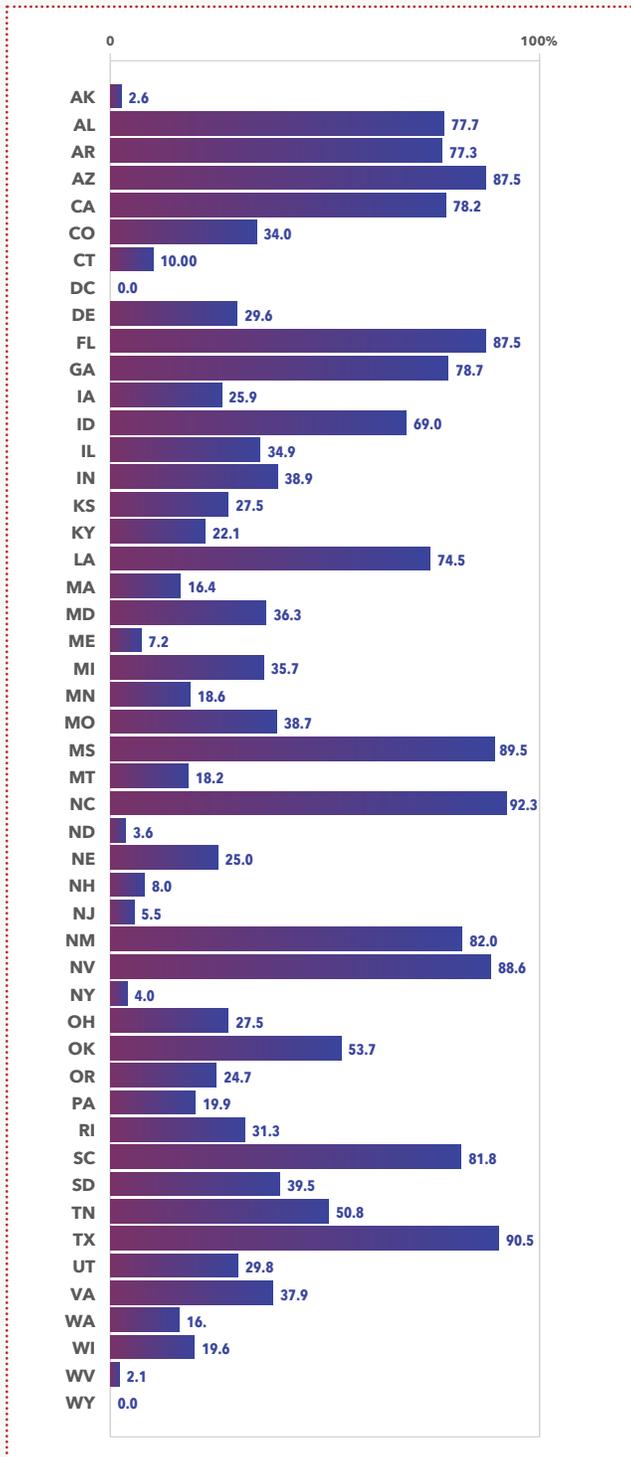
Finally, in comparing Figures 7 and 8, note that the percentages in Figure 7, in addition to being the “adequacy situation” for the typical student, also represent percentage differences between *total* spending and *total*

<sup>8</sup> The fact that districts operated by nongovernmental entities do not report finance data to the Census Bureau, and are therefore excluded from our model, means, of course, that most of D.C.’s very large charter school sector is not reflected in our estimates. We do not believe that inclusion of these schools/districts would substantially alter our statewide funding gaps, but they might increase the percentage of underfunded students in D.C., were some districts to spend below estimated adequate levels.

FIGURE 8

## Percent of students in underfunded districts

Percentage of students in districts with actual spending below estimated levels required to achieve national average testing outcomes, by state, 2020



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

DATA SOURCE: SCHOOL FINANCE INDICATORS DATABASE

estimated costs in each state. In other words, if we multiply each district's adequate per-pupil spending estimate by its enrollment and sum up these figures across the entire state (i.e., total costs), and then compare this to total spending, the percentage difference between the latter and former is presented in Figure 7. For example, total spending in Mississippi is about 37 percent below the total cost of "universal adequacy," whereas Wyoming spends over twice as much as it would need to provide every district with adequate funding (at least by our very modest standard of national average outcomes).

From this perspective, most states (33 of 48) already spend more than enough to achieve universal adequate funding (i.e., they have positive percentages in Figure 7). If, in other words, these states allocated funding based entirely on our adequate funding targets, they could achieve adequate funding in every single district. Yet, as is clear in Figure 8, virtually none achieves universal adequacy (zero percent in the figure), and relatively few even come close. This is due largely to the inequitable manner in which states distribute revenue to districts (as we'll discuss at length below).

For now, though, the relevant point is that funding adequacy varies enormously between states, but also that there are underfunded districts in virtually every state, including the generally well-funded states from Figure 7. That is, even in states such as Connecticut and New Hampshire, where the typical student's district spends far above our modest adequacy targets, there are substantial groups of students who fall through the proverbial cracks. Inadequate funding is a national problem (Baker, Di Carlo, and Weber 2021).

### THE COST OF UNIVERSAL ADEQUATE FUNDING

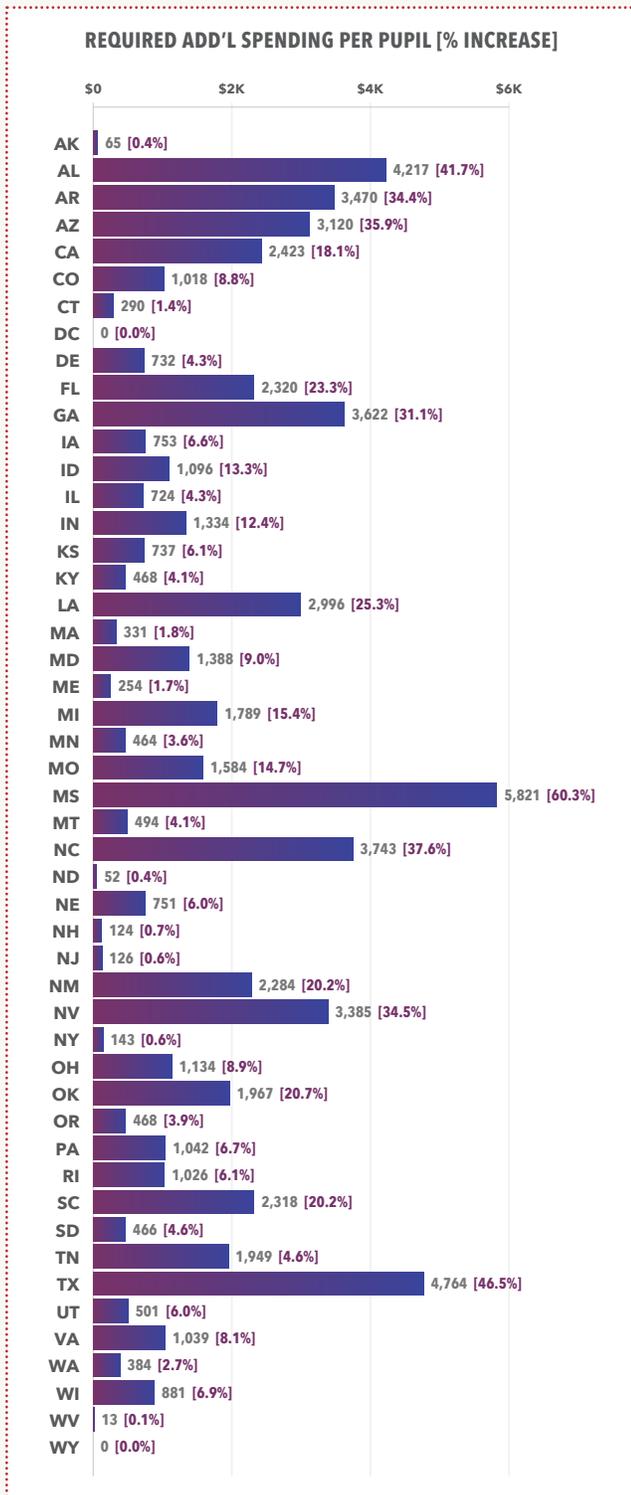
The sum of all negative (i.e., inadequate) funding gaps in the United States, ignoring all positive gaps, is roughly \$95 billion. That is equivalent to approximately 15 percent of total current spending in the more than 12,000 districts across 48 states and the District of Columbia for which we have adequacy estimates in 2020. In other words, it would cost about \$95 billion to bring all 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.

To be clear, this is just an illustration rather than an actual policy simulation. It assumes that the additional

FIGURE 9

### Adequate funding gaps

Additional funding (dollars per pupil and percent increase) required to close all negative funding gaps, by state, 2020



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

DATA SOURCE: SCHOOL FINANCE INDICATORS DATABASE



funding would be targeted exclusively at districts with negative funding gaps based on our model’s results. It is also, to reiterate, based on adequacy estimates “bench-marked” to a modest common goal (national average testing outcomes). It is likely that, in most states, the definition of “adequate” funding would aim for a higher bar.

That said, in Figure 9 we present how much each state would have to increase its current (2020) spending levels to bring all of its districts up to estimated adequate levels (while “ignoring” all districts with funding above our adequacy targets). We express these amounts in per-pupil terms so they are more comparable between states, and the figures in parentheses represent percentage increases (i.e., the required per-pupil increase as a percentage of actual per-pupil spending).

As would be expected from the results in Figures 7 and 8, the cost of universal adequacy varies dramatically between states, from under \$100 per pupil in states such as Alaska, D.C., North Dakota, West Virginia, and Wyoming, to more than \$4,000 per pupil in Alabama and Texas and nearly \$6,000 per pupil in Mississippi. In fact, roughly 60 percent of the \$95 billion total “gap closing” price tag would, due to their large gaps and enrollments, go to just five states—California, Florida, Georgia, North Carolina, and Texas—which together serve only about one-third of the nation’s students.

Yet the cost of this “thought experiment” would require an increase of over 5 percent in total 2020 spending in 30 of 49 states, and at least a 10 percent increase in 19 states. These are substantial investments to say the least. And in states such as Alabama, Mississippi, and Texas, the required additional investment is truly enormous (and would likely require federal aid, given these states’ effort levels and capacities). These are also, of course, not one-time payments; this new funding would be required annually.

On the other hand, there are almost 20 states in which universal adequacy—at least by our modest standard of national average outcomes—would require an increase of less than 5 percent (or, in a couple of cases, none at all). In these states, then, universal adequacy is within reach, particularly given that many of these states are below their pre-recession effort levels (see Figure 5).

### RAISING THE ADEQUACY 'BAR'

As discussed and reiterated above, we estimate our cost models using the adequacy “benchmark” of national average outcomes because this goal is intuitive and plausible, and its modesty allows us to identify with more confidence where funding is insufficient. Yet this goal is not only rather less than ambitious from, say, an international competitiveness standpoint, it is also below—and in some cases well below—some states’ academic standards and/or the performance increases they essentially demand from their districts (e.g., via formal test-based accountability systems). It is therefore worth examining statewide adequacy using a higher “bar.”

The dot plot in Figure 10 presents two statewide funding gaps for each state. The first (red circles) are based on national average outcomes; these are the same estimates as were presented in Figure 7. The second (blue circles) are statewide adequate funding gaps based on the common goal of *Massachusetts* average outcomes. In other words, these are, averaged across each state, the percentage difference between actual spending and estimated spending levels that would be required to achieve the goal of *Massachusetts* average test scores in reading and math. Alternatively, they represent the “adequacy situation” of the typical student in each state by the *Massachusetts* average outcomes standard.

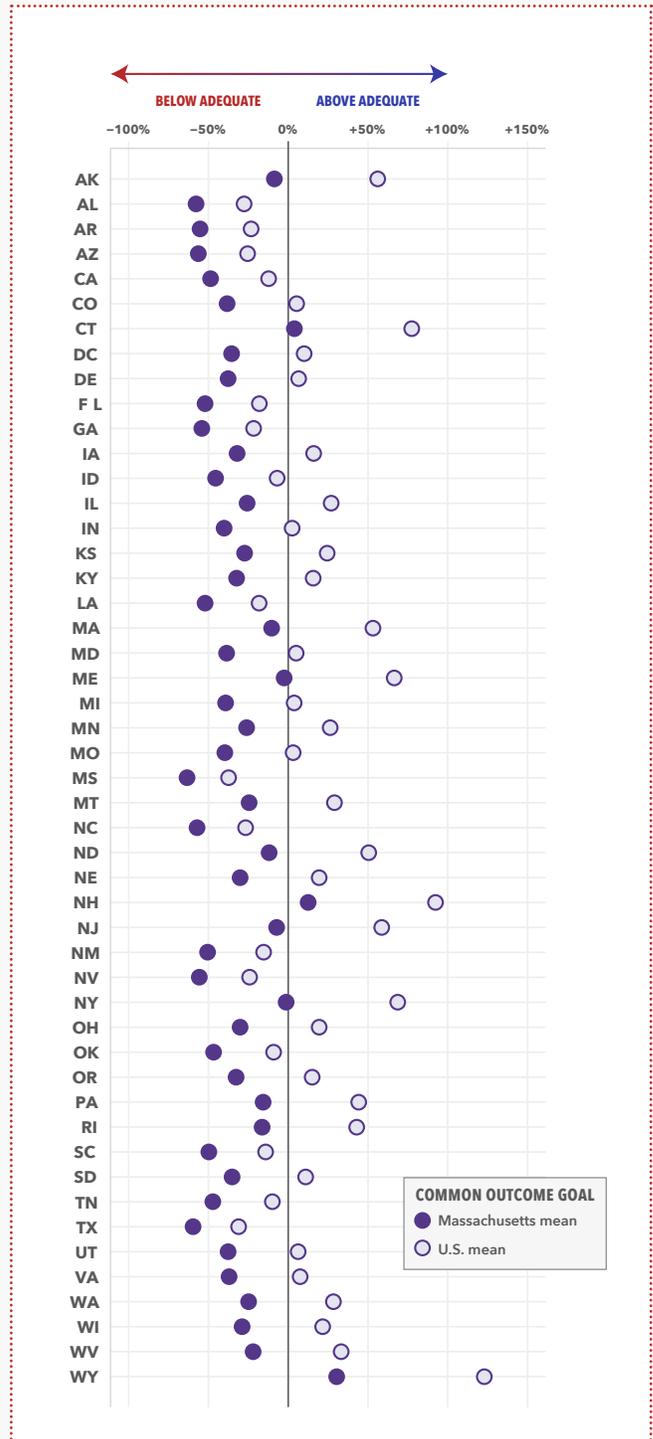
*Massachusetts*’ average scores on the National Assessment of Educational Progress exam are generally the highest in the nation. Equating each state’s standards with this *Massachusetts* average outcome is well beyond the scope of the report. Suffice it to say that it is an ambitious common goal in most states, but the key point for our purposes here is that the *Massachusetts* standard is considerably higher than the national average standard upon which we have thus far relied. And higher outcomes require more investment (Baker, Atchison, et al. 2020). As a result, funding in every state is substantially less adequate under the higher *Massachusetts* standard than that based on national average outcomes (i.e., the blue circles in Figure 10 are further to the left than are the red circles).

And the differences are quite striking. For instance, as discussed above, closing all adequate funding gaps based on the U.S. average standard would require around \$95 billion in additional funding. Under the *Massachusetts* standard, the figure is roughly \$440 billion. Similarly, whereas 52 percent of all students attend schools in

FIGURE 10

### Statewide spending adequacy - U.S. and Massachusetts standard

Percent difference between actual and estimated spending required to achieve national average and *Massachusetts* average testing outcomes, by state, 2020



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

DATA SOURCE: SCHOOL FINANCE INDICATORS DATABASE

districts with below adequate funding under the U.S. average common goal, the figure using the higher Massachusetts standard is approximately 86 percent. Put differently, if we define adequate funding as that required to achieve the (ambitious) goal of Massachusetts average scores, almost 9 in 10 of the nation's public school students are educated in districts with below adequate funding.

Returning to Figure 10, there are only three states (Connecticut, New Hampshire, and Wyoming) in which funding, on average (for the typical student), exceeds estimated adequate levels by the Massachusetts standard (in two of these states, however, at least 30 percent of students attend schools in underfunded districts, with Wyoming being the sole exception). Conversely, in 20 states, inadequate funding using this higher bar is virtually universal (at least 95 percent of students).

Whether the Massachusetts average outcomes are an appropriate benchmark for adequacy estimates is, of course, a matter of judgment. It would likely vary between states, according to many factors (including the preferences of legislators and taxpayers). At the very least, in recent years, some states have raised their academic standards without adjusting their funding formulas to reflect these higher expected outcomes (Baker and Weber 2022). And, in any case, the results in Figure 10 do very clearly illustrate the importance of where the bar is set for evaluations of absolute statewide adequacy.

### 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 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 11 presents a scatterplot of the relationship between our GSP-based effort indicator (from Figure 2) and statewide adequacy gaps (by the national average outcomes standard), expressed as the percentage difference between actual and required spending (from Figure 7). Each blue circle in the plot is a state, and the red dashed line represents the average relationship (“best fit”) between these two variables.

The scatterplot indicates a positive and fairly strong relationship between effort and adequacy—i.e., the red dashed line and the blue circles representing states tend to slope upward (the enrollment-weighted correlation between the two variables is 0.57). States that put forth higher effort tend to spend more adequately on their highest-poverty districts, and vice versa. This is not particularly surprising, but Figure 11 does offer some important insights into the causes of (and potential solutions to) inadequate funding.

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 (spending is 25 percent below our cost targets) and has the lowest effort of any state (2.62 percent) except for the District of Columbia (which, as discussed above, is not fit for comparison with other states). Several other states, including Florida, Nevada, North Carolina and Tennessee, also spend inadequately and put forth relatively low effort levels. These states have the means to improve their subpar funding.

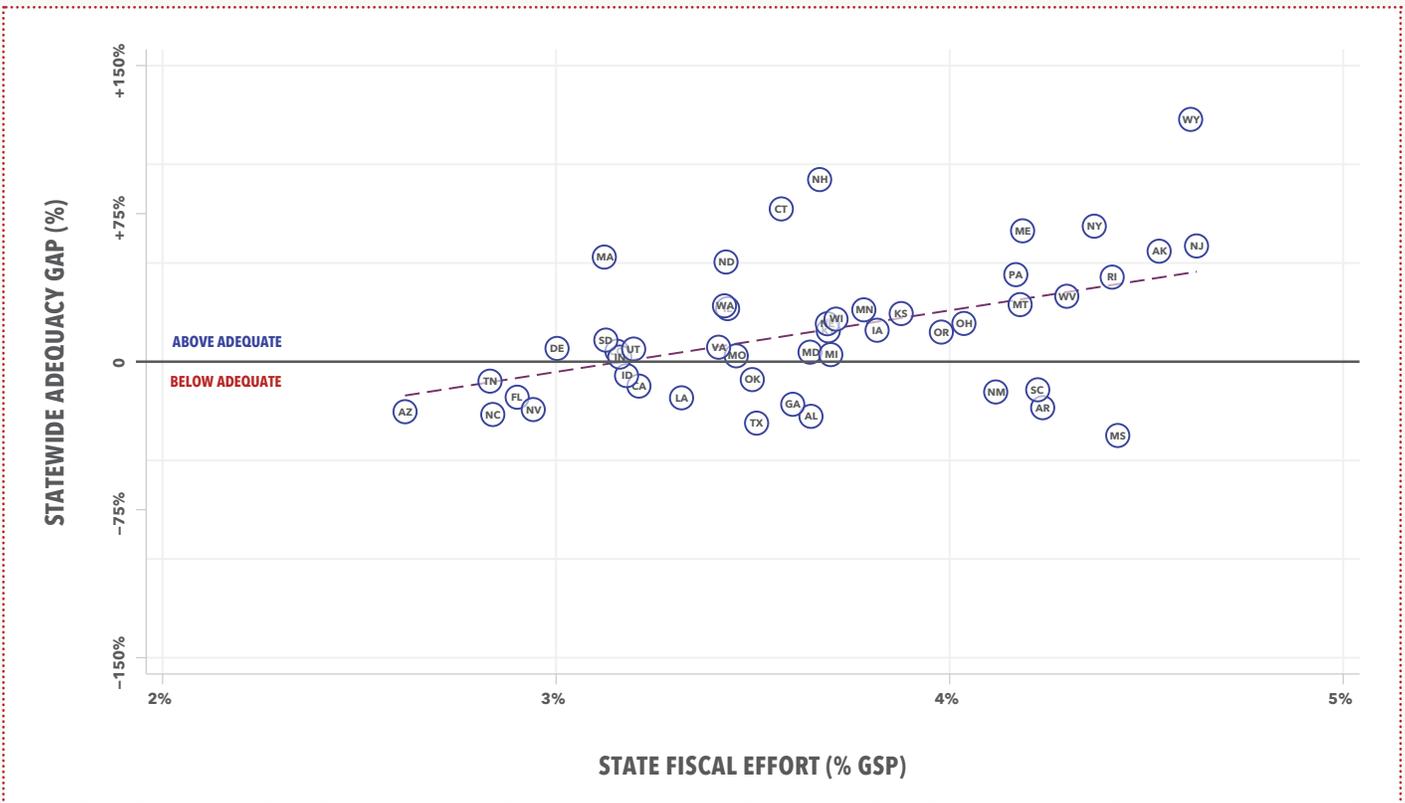
In contrast, the upper-right area of the plot includes states such as Alaska, New Jersey, New York, and especially Wyoming, all of which put forth above-average effort and exhibit the largest positive statewide adequate funding gaps. This shows, in general, that states willing to put forth the effort to fund their schools adequately tend to accomplish this goal.

Of particular concern, however, are the exceptions to the pattern—i.e., states that exhibit strong fiscal effort but still fall short of adequate spending levels. These include the small cluster of states in the lower-right area in

FIGURE 11

## Adequacy by fiscal effort

Scatterplot of percent difference between actual and estimated required spending required to achieve national average outcomes and state fiscal effort (direct spending as a percent of gross state product), 2020



Note: Dashed purple is best fit line. Graph does not include Hawaii or Vermont (adequacy not available), or D.C. (effort not comparable with other states').

DATA SOURCE: SCHOOL FINANCE INDICATORS DATABASE



Figure 11—i.e., states such as Arkansas, Mississippi, New Mexico, 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 are especially higher in poverty compared with students in other states. As a result, 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 3). 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 (Baker, Di Carlo, and Weber 2022). We shall return to this issue in the recommendations section.

Conversely, states with inadequate spending and *low* effort levels, including those mentioned above, should be encouraged to boost their effort (e.g., via taxation), perhaps as a condition of receiving some forms of federal assistance. 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.

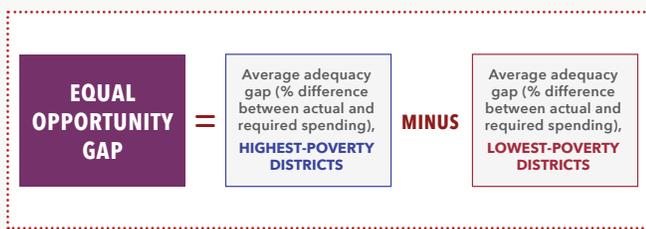
## EQUAL OPPORTUNITY

As discussed above (see Box 1), whereas statewide adequacy evaluates differences *between* states, equal opportunity is focused on how adequacy varies *within* states—e.g., between districts with different poverty levels. If, for example, higher-poverty districts are less adequately funded than more affluent districts in the same state, this means the state is failing in its duty to provide all students, regardless of their backgrounds, with an equal chance of achieving a common outcome. In other words, unequal opportunity begets unequal outcomes.

We would also reiterate that our equal opportunity indicator, while it uses the same adequacy estimates, is conceptually independent of our statewide adequacy indicator (see Box 1). Even if, hypothetically, a state achieves universally adequate funding by a given adequacy standard, that state may still exhibit unequal opportunity (i.e., if some districts are substantially more adequate than others). Conversely, states in which funding is widely below estimated adequate levels might still preserve equal opportunity, so long as all districts are below the adequacy line by roughly the same proportional amount.<sup>9</sup>

FIGURE 12

### State equal opportunity measure



Equal opportunity is also (at least mostly) independent of how high the adequacy bar is set (e.g., national versus Massachusetts average outcomes). A state in which opportunity is highly unequal by one standard will also tend to exhibit roughly the same inequality by a different standard (although raising or lowering the bar can affect the severity of that inequality).

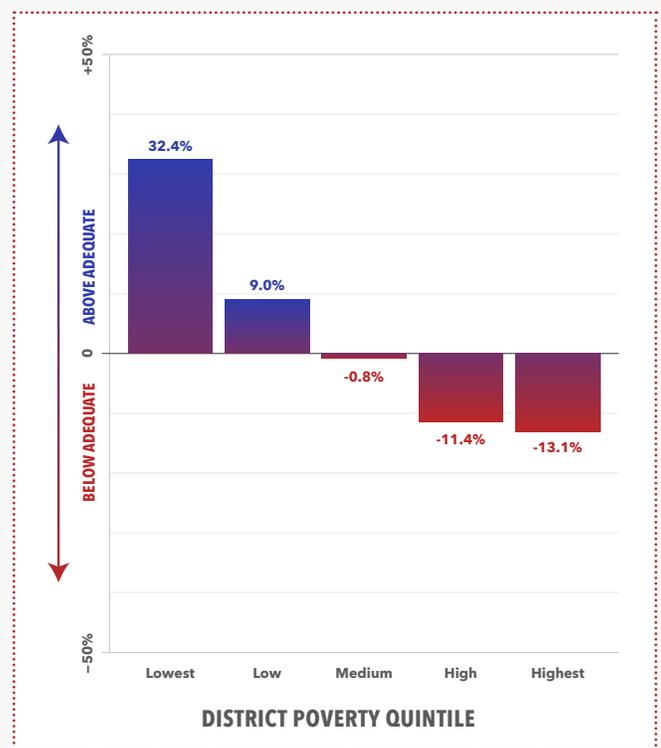
### SUMMARY OF U.S. AVERAGE ADEQUACY BY DISTRICT POVERTY

As shown in Figure 12, above, the difference in funding adequacy between the “highest-” and “lowest-poverty” districts in each state will be our primary summary measure of equal opportunity. But we might begin by providing, in Figure 13, a simple summary of how funding adequacy varies by district poverty *nationally*. The percentages in the graph represent the average difference between actual and required spending (i.e., adequate funding gaps), but here they are broken down by district poverty quintile and averaged across U.S. districts

FIGURE 13

### Adequacy by district poverty, U.S. average

Total state and local expenditures (direct to K-12 education) as a percentage of gross state product, U.S. average, 2006-2020



Note: Poverty quintiles are defined state by state. Average differences are weighted by enrollment and do not include Hawaii or Vermont (adequacy not available).

DATA SOURCE: SCHOOL FINANCE INDICATORS DATABASE



<sup>9</sup> Previous versions of this report, and of our framework for evaluating states’ systems, relied on a different third “core indicator”: progressivity. Progressivity in the SID is the degree to which higher-poverty districts in a given state receive more revenue than that state’s lower-poverty districts, controlling for labor costs, population density, and district size. This measure, as well as the estimates of adjusted spending and revenue by district poverty used to construct it, is still available in our state dataset, but we have chosen to replace it with equal opportunity as defined in this section, as we feel the latter is a far more useful and appropriate indicator for assessing the fairness and equity of states’ funding systems. Put simply, while progressive funding is generally required for equal opportunity (since costs increase with poverty), we are opting for a direct measure of equal opportunity, one that reflects both progressivity (i.e., states that provide more funding to their higher-poverty districts will perform better on our equal opportunity measure), as well as the fact that different states require different degrees of progressivity to achieve equal opportunity.

(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 13 are intended only to provide a sense of the national situation.

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 (32.4 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 one-third higher than the targets.

In the middle-, high- and highest-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 -1 percent in the middle-poverty quintile to -13 percent in the highest-poverty quintile.

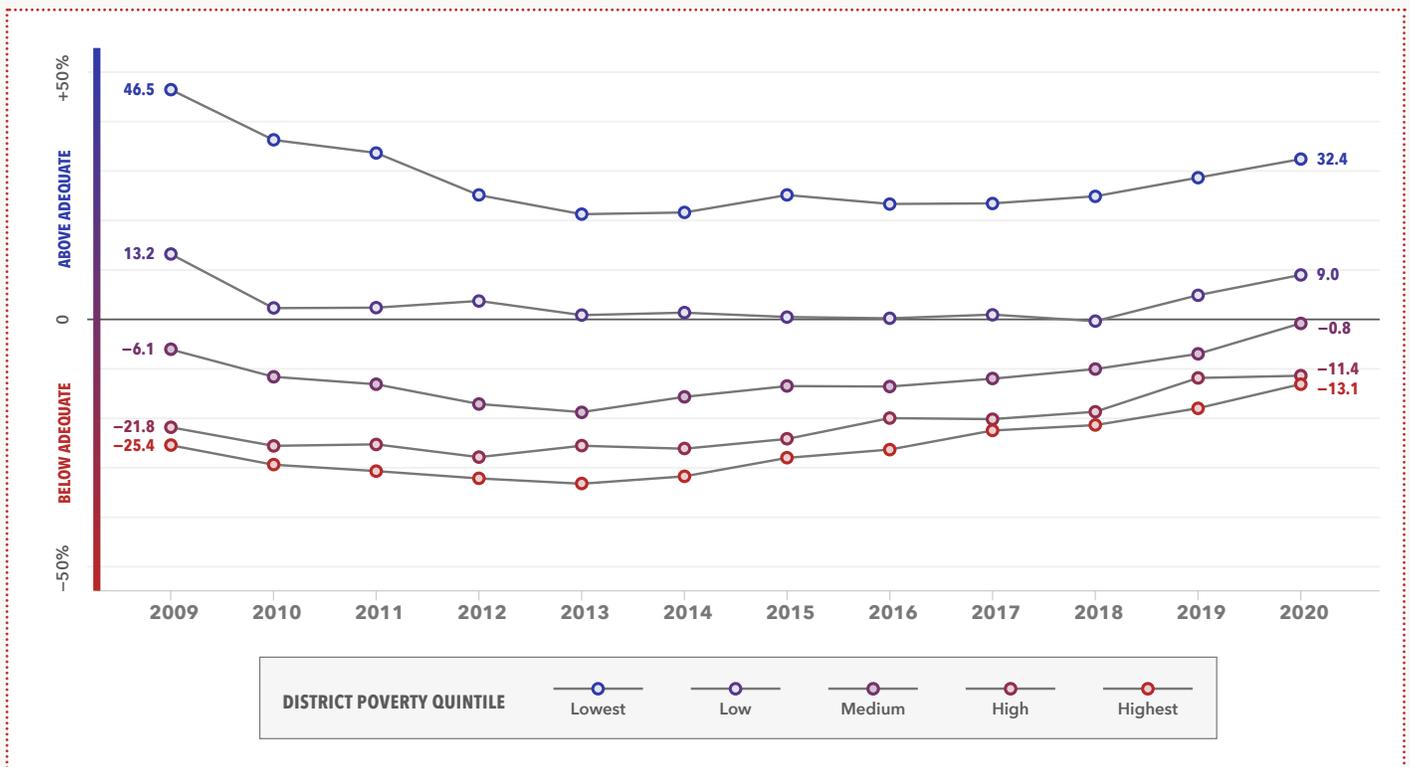
In other words, on average, districts in states’ highest-poverty quintiles spend only about 85 percent of how much they would have to for their students to achieve average math and reading scores (again, this means the national average for all students, regardless of poverty). And the situation in the second-highest poverty quintile is not much better—spending is more than 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.

FIGURE 14

### 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, 2009-2020



Poverty quintiles are defined state by state. Average differences are weighted by enrollment and do not include Hawaii or Vermont (adequacy not available).

DATA SOURCE: SCHOOL FINANCE INDICATORS DATABASE

Figure 14 is the same as Figure 13, except the percentage differences by district poverty level are presented for each year between 2009 and 2020. 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 U.S. average funding in the high- and highest-poverty districts became modestly less adequate (by about 6-7 points) between 2009 and 2012 (or 2013 in the case of the highest-poverty districts), both improved quite a bit between 2012-13 and 2020. In the highest-poverty districts, for example, the difference between actual and adequate funding levels went from roughly -25 percent in 2009 to about -13 percent in 2020, a net 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 2020 than it was in 2009). In general, then, the convergence of the lines in Figure 14 suggests 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 2020. Put differently, educational opportunity was less unequal in 2020 than in 2009.<sup>10</sup> If we express equal opportunity in terms of the “opportunity gaps” depicted in Figure 12, which focus solely on the highest- and lowest-poverty quintiles, the gaps went from around 72 points in 2009 to 45 points in 2020, a massive change.

It is, however, very 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 14 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 2020 (the volatility in the lines between 2009 and 2013, particularly the line for the lowest-poverty districts, would seem to offer some very tentative support for this possibility). Were this the case, the trend in funding adequacy in these districts would be less improvement per se than making up lost ground.

### EQUAL OPPORTUNITY BY STATE IN 2020

The dot graph in Figure 15 presents the same statistic as does Figure 13 (percentage difference between actual and required spending), but for each individual state, and only for the highest- (hollow red circles), medium- (solid blue circles) and lowest-poverty districts (hollow blue circles). Estimates by state for all five poverty quintiles in 2020 are presented in Appendix Table A2, and state-level estimates by poverty quintile and over time (2009-20) can be viewed using the data visualizations at the SFID website (or downloaded as part of the full SID dataset).

For example, Wyoming spends approximately 80 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, Nebraska, and New York, similarly, spend about 30 percent more than our targets (Alaska and Wyoming, as reiterated throughout this report, raise a large amount of revenue from natural resources such as oil and gas). These four states are among the 13 in Figure 15 that exhibit at least nominally adequate spending levels in their highest-poverty districts (i.e., the percentage difference between actual and required spending in the highest-poverty group, represented by the red circle, is positive).

In the majority of states, however, actual spending in the highest-poverty quintile falls well short of our estimated cost targets, including six states (Arkansas, Georgia, Louisiana, North Carolina, Tennessee, 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.

In contrast, as would be expected from the national averages in Figure 13, Figure 15 shows that spending is more adequate (or at least less inadequate) for the lowest- and medium-poverty quintiles than it is for the highest-poverty districts in virtually all states. In fact, whereas there are only 13 states in which the highest-poverty districts receive, on average, adequate funding, Figure 15 shows the opposite situation in states’ *lowest*-poverty districts:

<sup>10</sup>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, *when looking at national averages*, any positive gaps in states or districts will generally be offset by negative gaps in other states or districts.

FIGURE 15

## 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, 2020



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

DATA SOURCE: SCHOOL FINANCE INDICATORS DATABASE

There are only 10 states in which these relatively affluent districts receive funding *below* our estimated adequacy targets. In only one of these states (Mississippi) is the negative gap larger than 15 percent. And the size of some of these positive gaps is striking. In 11 states' lowest-poverty districts, actual spending is at least 100 percent higher than (i.e., twice as high as) required spending. In three states (Connecticut, New York, and Rhode Island), the gap is greater than 200 percent.

We now recast these results in terms of the “opportunity gaps” depicted in Figure 12—that is, the difference (in percentage points) between the adequacy gaps in the highest- and lowest-poverty district quintiles in each state. These gaps, which are presented in Figure 16, are a very simple but informative means of summarizing equal opportunity by state. Negative estimates indicate that funding is more inadequate (or less adequate) in higher-poverty districts than it is in lower-poverty districts within each state.

The first feature of Figure 16 that may jump out is the fact these bars are all negative and at least moderate in magnitude. The gaps range from around -19 points in Florida to over -233 points in New York. The (unweighted) average opportunity gap is approximately -75 points (as shown in Figure 13, the enrollment-weighted average gap is about -45 points).

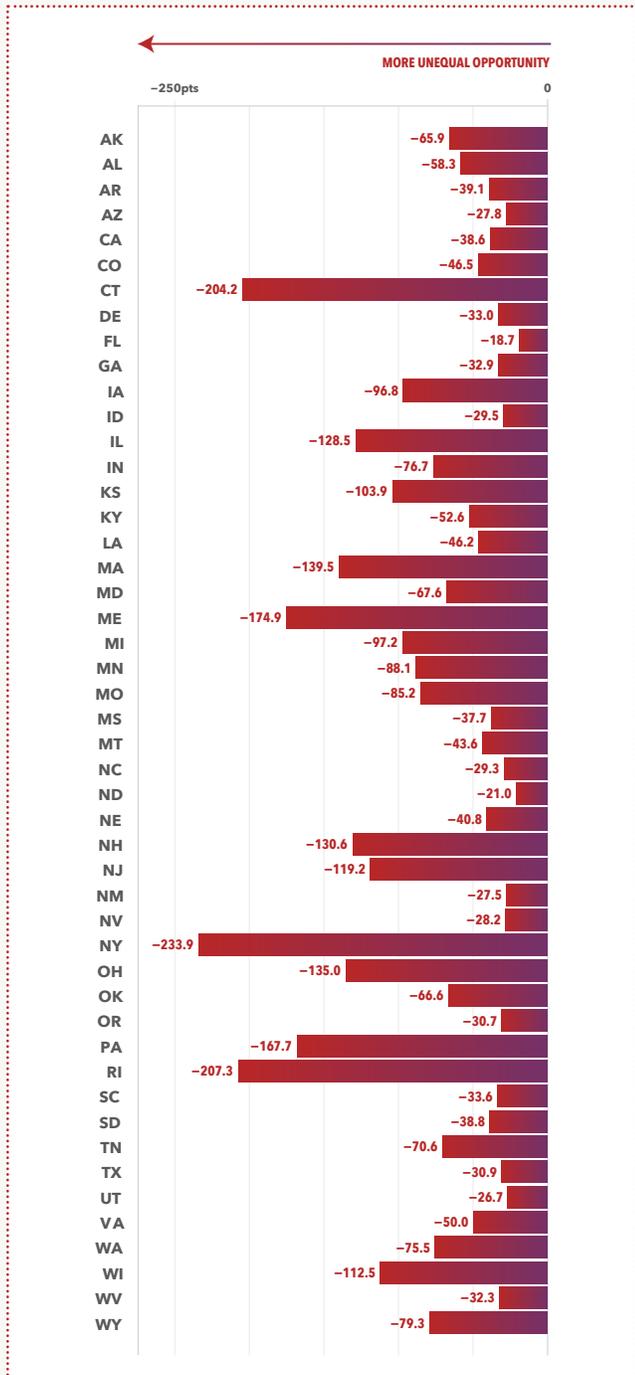
To be clear, the fact that opportunity gaps are negative and at least moderate in magnitude in every state is due primarily to states' failure to fund their schools in a manner that accounts for inter-district differences in the cost of achieving common educational goals. The distribution of revenue in most states is either flat (high- and low-poverty districts receive roughly the same amounts per pupil) or regressive (low-poverty districts receive more). And, in those states where revenue is allocated progressively (high-poverty districts get more), the extent of progressivity is typically moderate (Baker, Di Carlo, Reist, et al. 2021). In other words, unequal opportunity is largely a policy choice.

The structure of districts can also mitigate or exacerbate unequal opportunity. For example, all else being equal, states in which districts are more fragmented (e.g., more districts per student) will tend to exhibit more unequal opportunity, as there is less structural opportunity for “sharing” of resources between districts that serve different student populations. This might help to explain,

FIGURE 16

### Equal opportunity gaps (district poverty-based)

Difference (in percentage points) between adequate funding gaps in the highest- and lowest-poverty districts, by state, 2020



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

DATA SOURCE: SCHOOL FINANCE INDICATORS DATABASE



for example, Florida’s comparatively smaller opportunity gaps; the number of students served by the typical Florida district is well over an order of magnitude larger than it is in more fragmented states such as Connecticut and New York. Similarly, other less fragmented states, such as Nevada and Utah, also perform comparatively well on equal opportunity.

In any case, these results clearly indicate that even in those relatively few states where funding exceeds our estimated adequate levels for all poverty quintiles, equal educational opportunity as we define it (see Box 1) remains elusive, and indeed tends to be quite drastically unequal. 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. These states are essentially reproducing unequal student outcomes, every year, by design.

### ADEQUACY GAPS AND STUDENT OUTCOMES

The opportunity gaps discussed above are not abstract statistics; they have serious implications for student performance. When interpreting the relationship between our adequacy estimates 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.

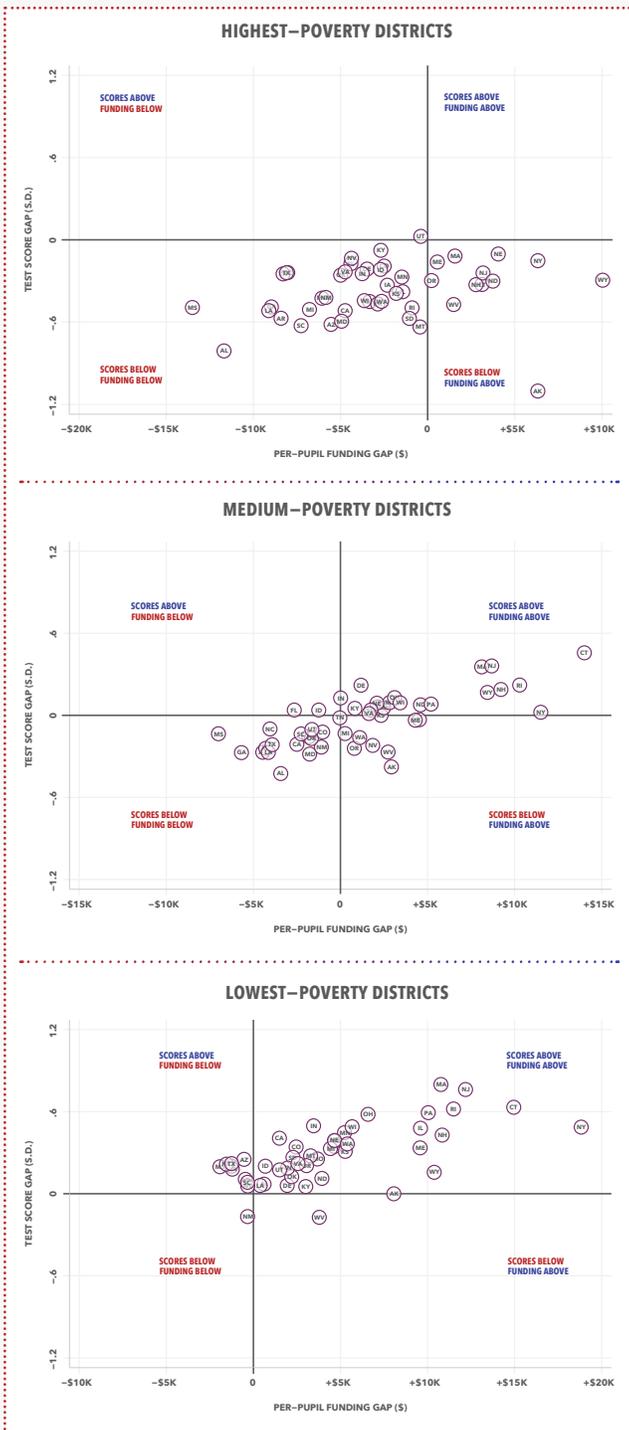
To get a better sense of the actual “distances” involved here, we take a look at the relationship between spending gaps and testing outcome gaps, by district poverty, in Figure 17.<sup>11</sup> We will once again focus on the highest-poverty, medium-poverty and lowest-poverty quintiles in each state.

<sup>11</sup> The testing gaps presented in Figure 17 are actually 2019 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.

FIGURE 17

### Test score gaps by adequate funding gaps

Scatterplot of gap between state and national average test scores (in standard deviations) by gap between actual and estimated required spending per-pupil (\$), by district Census poverty quintile, 2019-20



Note: Testing outcome gaps are for 2019. Plots do not include Hawaii or Vermont (adequacy not available). D.C. estimates only available for the highest-poverty quintile.

DATA SOURCE: SCHOOL FINANCE INDICATORS DATABASE; STANFORD EDUCATION DATA ARCHIVE

In each plot, the circles are individual states. 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 black 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 13 and 15), 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 Utah 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.

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, discussed above, is the fact that our federal spending data, our nationally normed testing data and our models are all subject to imprecision.

That said, Figure 17 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 more generally for inequality in the United States.

We might very quickly illustrate this relationship by examining one additional plot, which is presented in Figure 18. This plot is simply each state's opportunity gap (from Figure 16) by its "achievement gap," which we express here as the difference (again, in standard deviations) between the average student outcomes in each state's highest- and lowest-poverty districts. States (circles) further down in the plot are those with larger achievement gaps (highest-poverty districts score more poorly relative to the lowest-poverty districts), while states further to the left of the plot are those in which opportunity is more unequal (i.e., more negative opportunity gaps). Note, in other words, that the "direction" of this plot may be somewhat counterintuitive, as the size of achievement gaps (the y-axis) decrease as one moves upward in the plot, while unequal opportunity decreases as one moves left in the plot.

That said, the association here is positive and significant—states with larger opportunity gaps also tend to exhibit larger achievement gaps, as is clear in the upward slope of the red "best fit" line—but the correlation is somewhat modest in strength (the weighted correlation coefficient is 0.42). This "noise," again, may be due in part to some combination of imprecision in our data, models, and measures as well as differences in the efficiency of spending (at least insofar as that efficiency is measured using testing outcomes).

### UNEQUAL OPPORTUNITY BY STUDENT RACE AND ETHNICITY

Given the well-documented 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, Di Carlo, and Green 2022). In addition, there is evidence that these race-/ethnicity-based funding gaps cannot be "explained away" by poverty (Baker, Srikanth, et al. 2020).

FIGURE 18

## Student achievement gaps by equal opportunity gaps

Scatterplot of difference (in standard deviations) between student testing outcomes in the highest- and lowest-poverty districts and difference (in percentage points) between adequate funding gaps in the highest- and lowest-poverty districts, 2020



Note: Testing outcome data are for 2019, and the estimates represent the difference from the U.S. average. Graph does not include Hawaii or Vermont (adequacy not available). D.C. estimates only available for the highest-poverty quintile.

DATA SOURCE: SCHOOL FINANCE INDICATORS DATABASE



In panel A of Figure 19, we present the percent of students attending districts with funding below estimated adequate levels in 2020 by student race and ethnicity.<sup>12</sup> We find that 35 percent of white students attend districts with negative gaps, compared with 75 percent of African American students and 71 percent of Latinx students.<sup>13</sup> In other words, African American and Latinx 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 45 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 55 percent, and the estimate for students reporting “two or more races” is 47 percent.

Whereas panel A of Figure 19 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 African American student attends a district in which funding is roughly 17

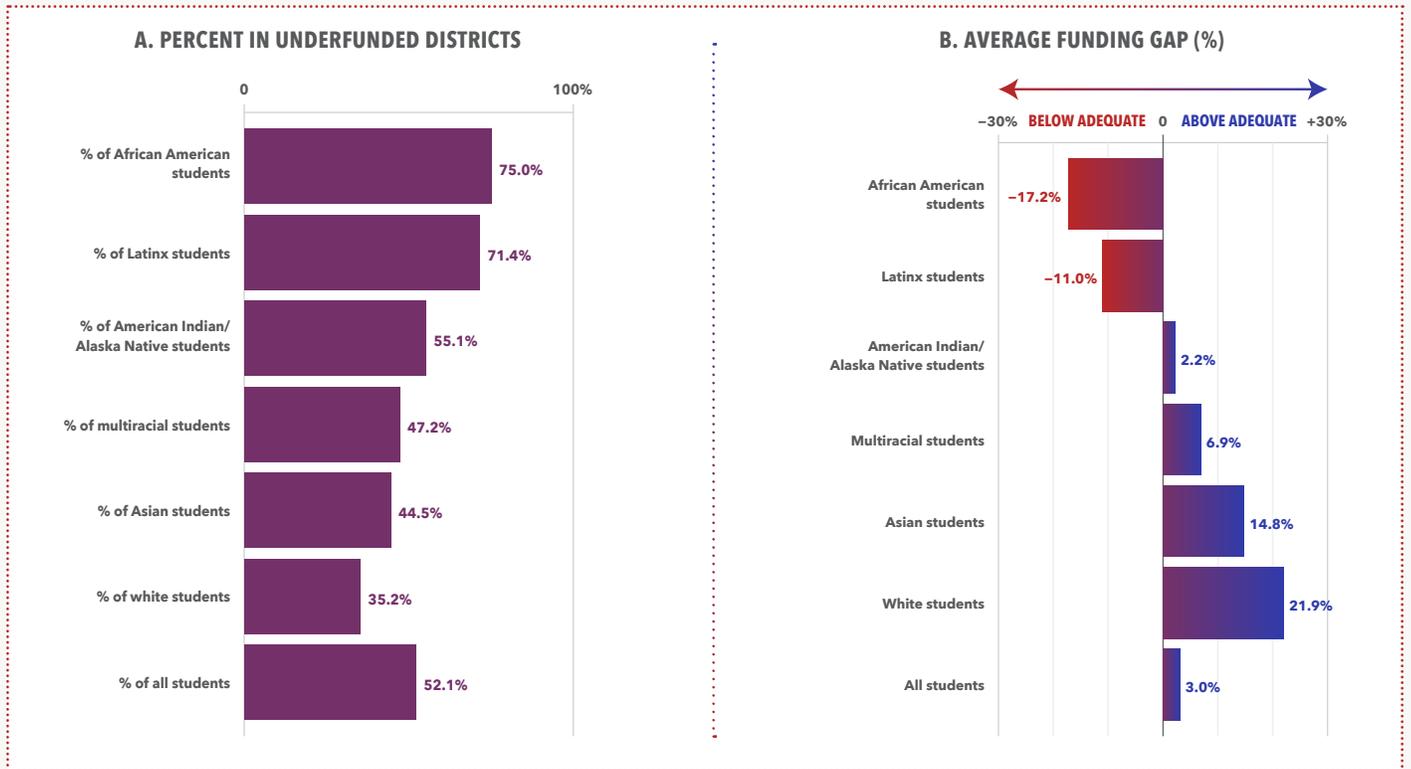
<sup>12</sup>The estimates presented in Figures 19 and 20 are calculated using the SFID’s District Cost Database, and aggregated to the state level.

<sup>13</sup>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 19

### U.S. funding adequacy by student 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, 2020



Poverty quintiles are defined state by state. Average differences are weighted by enrollment and do not include Hawaii or Vermont (adequacy not available).

DATA SOURCE: SCHOOL FINANCE INDICATORS DATABASE



percent below adequate, the average gap for Latinx students is about -11 percent, and the difference for American Indian/Alaska Native students is 2 percent above adequate. In contrast, the average white student’s district spends 22 percent *above* our adequate targets, and the average Asian student’s district spends 15 percent above our adequate targets.

Figure 20 presents race- and ethnicity-based opportunity gaps by state. This is the same statistic as is presented by district poverty in Figure 16, but in Figure 20 the markers represent the difference in adequate funding gaps between African American and white students (blue circles) and those between Latinx and white students (red circles). We limit this graph to white, African American and Latinx students because the share of students in the other groups is extremely low in the majority of states (the frequencies of African American students are also quite low in a few states, particularly Wyoming and Montana). Finally, note that the District of Columbia is

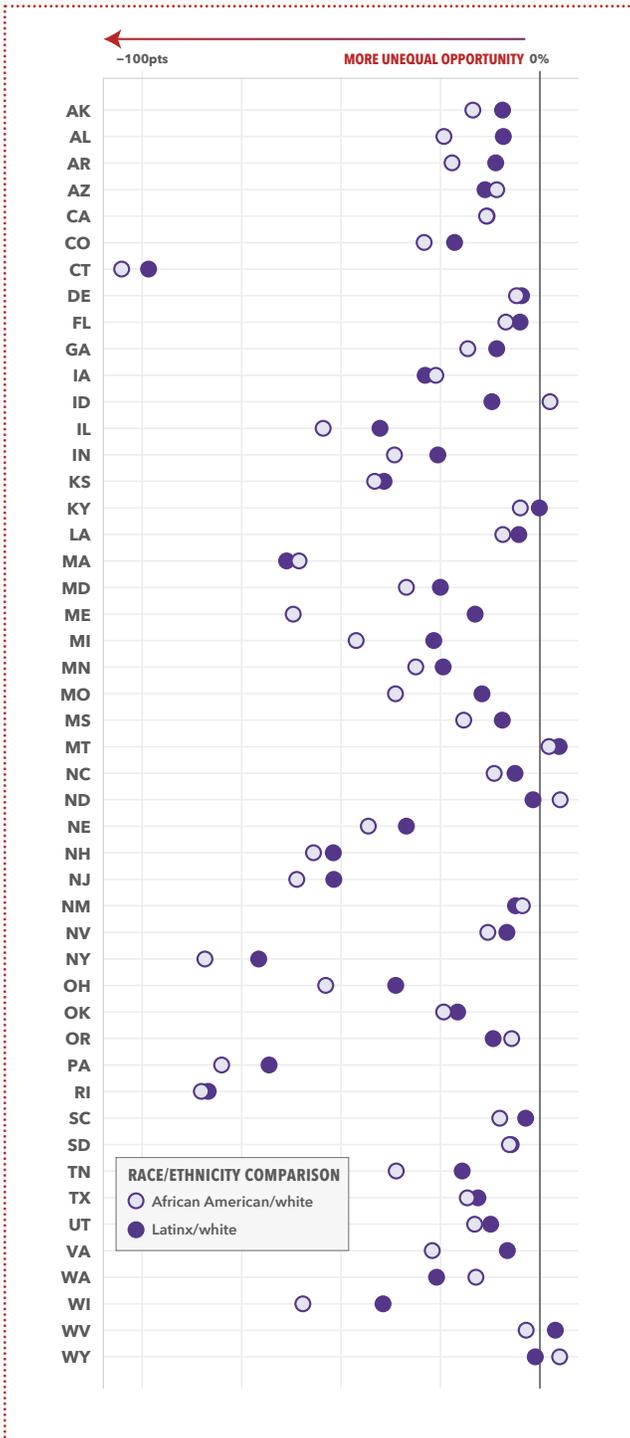
excluded from this graph because it consists of a single government-run district (and so estimates do not vary by student race or ethnicity).

In 43 out of 48 states in Figure 20, funding, on average, is less adequate for both African American and Latinx students than it is for their white peers. In 11 states, these opportunity gaps are larger than 50 points for either the African American/white or Latinx/white comparison, and in seven states the gaps are greater than 50 points for both comparisons. Most shockingly, opportunity gaps are approximately 100 percentage points for both comparisons in Connecticut, with smaller but still truly severe (at least 75 point) discrepancies in New York, Pennsylvania, and Rhode Island. As was the case with the district poverty-based opportunity gaps, even in those states where funding is generally adequate across most districts (at least by our modest standard), educational opportunity tends to be severely unequal.

FIGURE 20

### Equal opportunity gaps (student race- and ethnicity-based)

Difference (in percentage points) between adequate funding gaps of white versus African American and Latinx students, by state, 2020



Note: Graph does not include Hawaii or Vermont (adequacy not available), or D.C. (single district so adequacy does not vary by race/ethnicity).

DATA SOURCE: SCHOOL FINANCE INDICATORS DATABASE

Moreover, the handful of states in which we find positive gaps tend to be those with relatively small shares of Black and/or Hispanic students. For example, out of the six comparisons for which we find positive opportunity gaps (i.e., funding for the typical African American or Latinx student, on average, is more adequate than for the state’s white students), four reflect African American or Latinx shares under 2 percent, and all are lower than 6 percent. In other words, where opportunity gaps “favor” students of color, students of color are sparsely represented.

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.

## SUMMARIZING STATES' PERFORMANCE

Our three core measures of effort, adequacy and equal opportunity are specifically chosen to summarize states' systems in terms of how much they raise, whether it is enough versus common outcome goals, and whether the latter varies by districts (e.g., by poverty) or between student groups (e.g., by student race/ethnicity). 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.

1. The details are different from state to state, but all systems should rely on a basic, relatively simple conceptual model, which can be described as follows:
2. Effort, combined with states' capacity, drives state and local education revenue;
3. State and local systems (ideally) allocate revenue depending on student need (e.g., poverty) and context (e.g., labor costs), which in turn determine per-pupil expenditures for districts at different poverty levels;
4. How these resources are spent, and whether they are sufficient to provide high-quality education to students in each district, determines adequacy, equal opportunity, and, eventually, shapes student outcomes.

In this section, we offer a brief discussion of the interplay between our three primary measures, as well as overall state scores.

### THE RELATIONSHIP BETWEEN ADEQUACY, EFFORT, AND EQUAL OPPORTUNITY

The scatterplot in Figure 21 helps to illustrate the complex interdependency of our three core indicators. On the vertical axis are opportunity gaps (from Figure 16), while the horizontal axis presents (statewide) adequate funding gaps (from Figure 8). States (i.e., circles) in the upper left corner of the plot are those with the lowest statewide adequacy but most equal (or, more accurately, least unequal) opportunity, whereas states in the bottom right provide the most adequate but least equitable funding. Finally, we divide states into three roughly equal groups based on their effort levels, and color code them as low (red), medium (purple), or high effort (blue).

The circles in Figure 21 exhibit a rather clear downward sloping motion, indicating that as statewide adequacy increases, opportunity tends to be more unequal, and vice-versa (the weighted correlation here is  $-0.86$ ). In the bottom right corner of the plot we see that most of the 10 or so states with the most adequate funding statewide also exhibit the most unequal opportunity (the partial exceptions are the energy-producing states Alaska, North Dakota, and Wyoming). Conversely, the 15-20 states in which statewide adequacy is negative have the least unequal (though still unequal) opportunity, as is evident in the clustering of states in the upper left corner of the plot.

This is an interesting and important (negative) association, and it belies simple explanation. Regarding the states in the upper left (low adequacy and less unequal opportunity), it may be the case that, in states where the vast majority of districts are poorly funded, there simply isn't enough funding to generate relatively large gaps between districts. It may, in this sense, be easier to "achieve" equal opportunity when statewide adequacy is low.

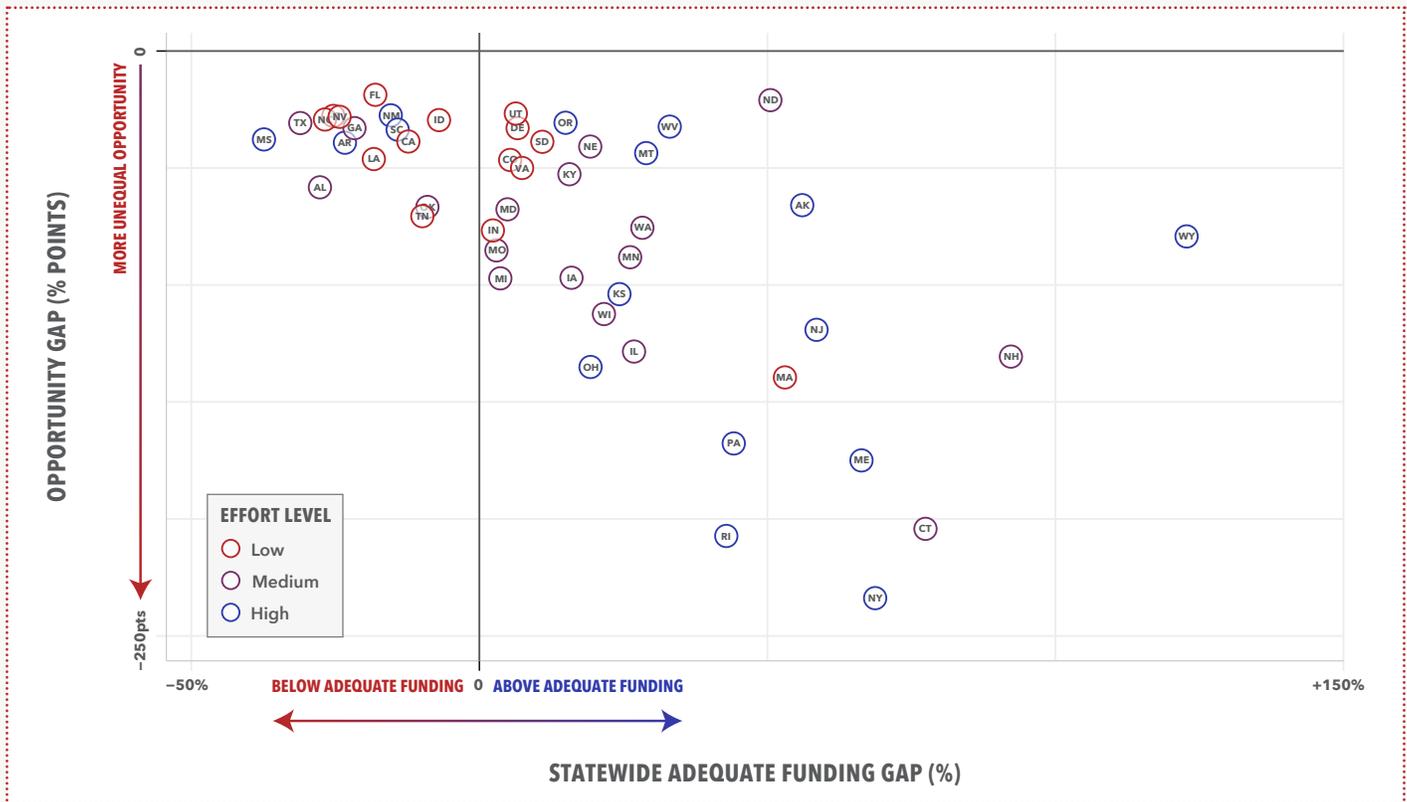
Yet Figure 21 also illustrates an important distinction within this cluster of states: They vary quite widely in their effort levels. As discussed above, several of these states, including Arizona, California, Florida, Idaho, Louisiana, Nevada, and North Carolina, are relatively low-effort states (red circles), which means they are essentially choosing to tolerate below-adequate funding despite having the option to ameliorate that situation. In contrast, high-effort states in this group (blue circles), such as Arkansas, Mississippi, New Mexico, and South Carolina, are devoting relatively large shares of their economies to their public schools, but their smaller economies and higher costs render them unable to fully meet their students' needs.

Among the five to 10 states in the lower right-hand corner of the plot—i.e., more adequate funding, highly unequal opportunity—effort is generally quite high (or at least medium). These states not only devote relatively large shares of their capacity to their schools, but several also have large economies from which to draw revenue. The result is that revenue overall is sufficient for most districts to meet our modest adequacy thresholds, but there

FIGURE 21

## Opportunity gaps by adequate funding gaps

Scatterplot of difference (in percentage points) between adequate funding gaps in the highest- and lowest-poverty districts and percent difference between actual spending and estimated spending required to achieve national average test scores, with fiscal effort categories, 2020



Effort categories based on sorting by terciles. Scores are not calculated for Hawaii or Vermont (adequacy not available), or D.C. (estimates only available for the highest-poverty quintile, precluding calculation of opportunity gaps).

DATA SOURCE: SCHOOL FINANCE INDICATORS DATABASE



are large discrepancies in adequacy between higher- and lower-poverty districts.

It bears noting that many of these states' K-12 funding adequacy is unequal, in part, because inequality is higher between their districts. If, for instance, we used the difference in predicted costs (i.e., adequate funding levels) between the highest- and lowest-poverty quintiles as a rough proxy for inequality, several of the states in the lower right corner, including Connecticut, Massachusetts, New York, Pennsylvania, and Rhode Island are among the highest-inequality states in the nation, with differences ranging from \$10,000 to \$14,000 per pupil in predicted costs between their most and least affluent districts.

To be clear, however, this is *not* an “excuse” because this situation is not outside states' control. These states raise more than enough to provide all their districts with ad-

equate and equitable funding, but much of this funding comes in the form of local revenue (mostly from property taxes), which are regressive (higher-poverty districts get more). The result is massive amounts of additional local revenue in affluent districts (where costs are lower), thus exacerbating unequal opportunity. In addition, as discussed above, many of these states are fragmented, with large numbers of relatively small districts “shielded” from sharing their local capacity with poorer districts in their areas (Baker and Corcoran 2012).

### OVERALL STATE SCORES

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, it is difficult to evaluate the results of one measure without referring to the others.

This 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 legislators and 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.

Overall state scores, presented in Figure 22, are calculated very simply. They are a weighted average of the following

five components (each component is normalized, and the weights are in parentheses):<sup>14</sup>

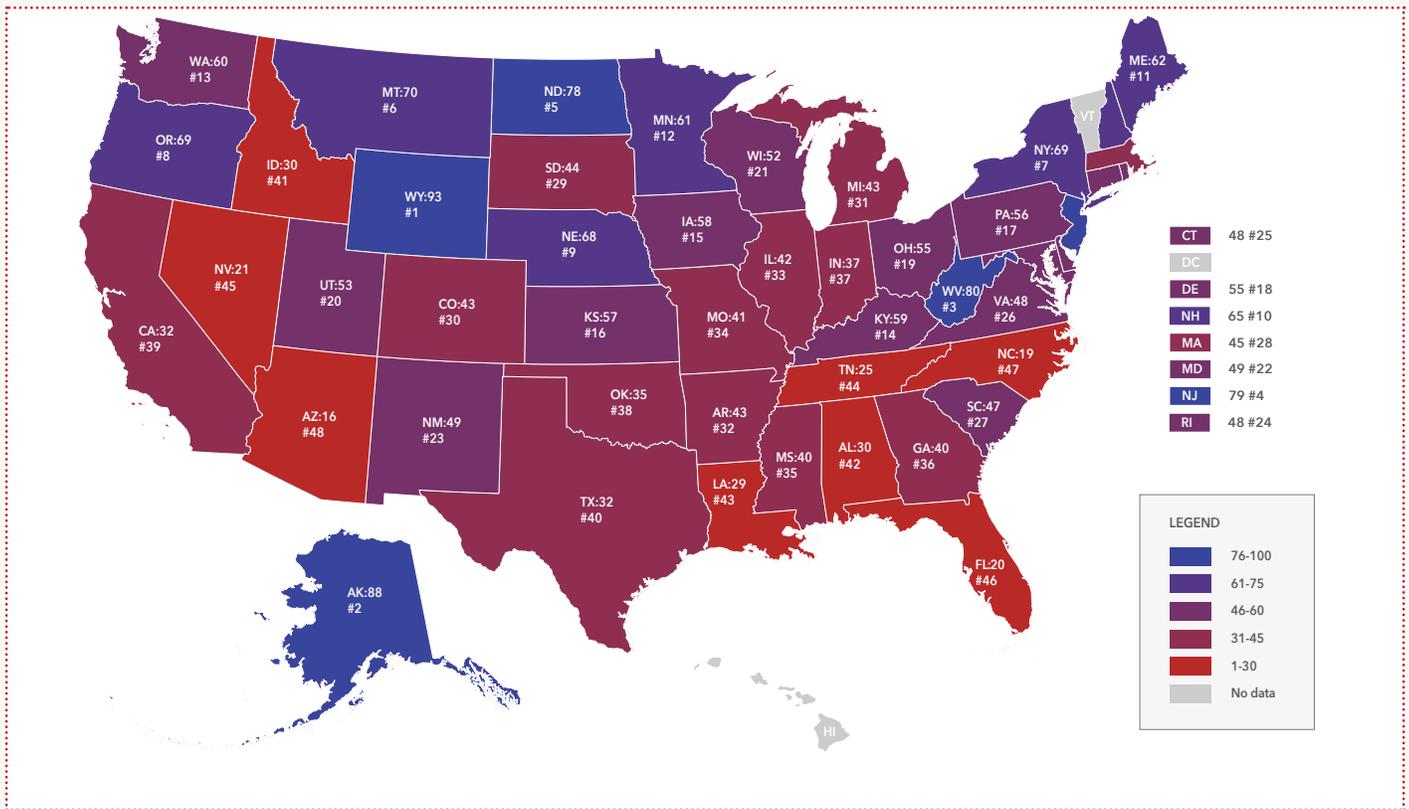
1. **Statewide adequacy** (45 percent);
  - a. Percent of students in districts with above-adequate funding (weight: 22.5 percent);
  - b. Percent difference between actual and required spending (22.5 percent);
2. **Fiscal effort** (30 percent);
  - a. GSP-based (15 percent);
  - b. Aggregate personal income-based (15 percent);
3. **Equal opportunity**: difference in adequate funding gap between highest- and lowest-poverty districts (25 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

FIGURE 22

### Overall state finance system scores

Weighted average of effort, adequacy, and equal opportunity measures, by state, 2020



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).

DATA SOURCE: SCHOOL FINANCE INDICATORS DATABASE



<sup>14</sup> Each measure is converted to z-scores, 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). The District of Columbia, Hawaii, and Vermont are excluded from all calculations and from the final ratings because they are missing one or more of the constituent measures.

necessarily have good systems per se, only *better systems* compared with other states on our selected measures using our selected weights. Second, and most obvious, the measures we have selected, as well as the weights we have assigned, reflect our subjective judgments as to the importance of each indicator.

In Figure 22, 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 because they are missing one or more of the measures used to calculate the scores.

There are, of course, no surprises in Figure 22. Alaska and Wyoming, with their high effort and widely adequate funding coupled with only moderately unequal opportunity, top the list with scores of 88 and 93, followed somewhat distantly by West Virginia (80), New Jersey (79), and North Dakota (78).

Conversely, Arizona (16), North Carolina (19), Florida (20), and Nevada (21) receive the lowest scores. 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 among the nation's lowest effort levels (on both the GSP- and income-based versions) and statewide adequacy scores, but its equal opportunity score, due in part to the aforementioned "funding is so low across the board that inter-district discrepancies are more rare" phenomenon, is among the nation's five best.

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 and New Jersey, several "blue" states, such as California and Illinois, have scores toward the bottom of the distribution.

One factor generating noise in this association is the fact that 4 of the top 5 states in Figure 22 (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' relative performance on our measures. It is nevertheless the case that the performance of states' K-12 finance systems is not, as might be expected, a "red/blue" issue.

## RECOMMENDATIONS

The enormous “under the hood” heterogeneity of state school finance systems means that any attempt to offer national recommendations will inevitably be more general than specific. States’ systems are complex, develop over time, and reflect many years of political compromises. The end goal here is universal—all districts, and therefore all students, should have what they need to achieve common (and hopefully desirable) goals, but the path to those goals will always vary state by state.

What we have shown in this report is that the vast majority of states are nowhere near that goal, and the few within earshot are still rather far away. Some states fail to raise enough revenue to meet their student needs even by our modest adequacy standard; others raise copious revenue overall but fail to target it based on need and local capacity; and still other states fall somewhere in between. The good news is that boosting statewide adequacy will tend to improve equal opportunity, and policies that lead to more equal opportunity will also tend to improve statewide adequacy. The changes in specific policies that are needed for achieving these goals, again, will vary by state, but there are general principles that apply across most states. Throughout the remainder of this section, we offer recommendations for improving state finance systems.

**Better targeting of funding (especially state aid).** The backbone of any state finance system is the procedure by which target funding levels are determined for each district. If funding targets are not determined properly and rigorously, funding may appear adequate and equitable when it is not. Ideally, these targets should represent reasonable calculations of how much funding each district needs to achieve a common outcome goal, given its student population and other contextual factors (e.g., labor costs). Our results on statewide adequacy and equal opportunity suggest that the vast majority of states (and in many respects all states) are either failing to set these targets appropriately, refusing to fund them properly, or both.

- Although we would suggest using state-specific, output-based cost models to set these targets, there are alternative approaches that might also be feasible (Baker 2018). As a first step, all states should “audit” their funding targets by comparing them with esti-

mates from rigorous analyses (e.g., cost models) that account for student and district characteristics that influence costs (e.g., Atchison et al. 2020; Kolbe et al. 2019; Taylor et al. 2018). Once targets are in place, states should then allocate state aid such that all districts have what they need, minus a reasonable local contribution (based on the capacity of each district to produce revenue).

- The equity-producing benefits of state aid are also compromised by policies in many states that are buried in complex legislation or overlapping formulas that require in-depth analysis to uncover. For instance, many states have enacted provisions by which districts are entitled to some minimum level of state aid regardless of their needs or local capacity, whereas others provide local tax relief in the form of additional state aid. Similarly, states often maintain multiple state revenue streams on top of their general formulas, including, for example, flat-rate block grants that are also distributed without reference to costs or local wealth (Baker and Corcoran 2012). Any state aid that is not allocated according to need and local capacity will tend to exacerbate unequal opportunity, while also failing to maximize the adequacy benefits of state revenue.

**Increase funding to meet student needs where such funding is inadequate.** This is, perhaps, the most obvious of our recommendations, but we would emphasize that the point here is not simply to increase funding. It is, rather, to ensure that funding is *commensurate with costs/need*, with a particular focus on allocating enough state aid to compensate for variation in local capacity. In order for effective targeting of funding to achieve adequacy and equal opportunity, there must be enough funding.

- In states where funding is widely inadequate (see Figures 7 and 8), this might include a substantial increase in local revenue from districts where capacity is sufficient but revenue is lower than would be expected from that capacity (Baker, Di Carlo, and Weber 2022). “Fair share” contributions of local revenue by districts are the foundation of good finance systems, and cracks in that foundation will compromise the benefits of state aid.
- In virtually all states, however, the key is increasing state revenue (e.g., from state sales and income taxes), particularly in states where effort is medium or low

(i.e., where there is capacity to raise more revenue). This additional revenue might come from tax increases and/or from promising possibilities for expanding state tax bases, such as state taxation on nonresidential property (Brent 1999; Ladd 1976).

- In some states, meaningful increases in resources may require the phasing out of policies that constrain revenue or spending growth (e.g., Colorado’s TABOR or Proposition 13 in California).
- Finally, states should also examine their revenue “portfolios”—i.e., the composition of their revenue by source (state vs. local) and tax type (sales, income, property)—and consider making adjustments to maximize equity and minimize volatility during economic downturns; the latter tends to cause disproportionate harm in higher-poverty districts (Baker and Di Carlo 2020).

**Distribute federal K-12 aid based on both need and effort.** The unfortunate truth is that many states with widely inadequate funding have the economic capacity to rectify that problem partially or even wholly by devoting a reasonable share of their economies to their schools. Several other states, in contrast, do put forth strong effort but their costs are so high (e.g., high-poverty student populations) and/or their economies are so small that they cannot possibly meet their students’ needs. For these latter states, as well as, to a lesser extent, those in which effort is high but substantial groups of students remain in underfunded districts, federal education aid can serve as a vital bridge to more adequate and equitable funding.

- We recommend some type of federal “foundation aid” approach, in which supplemental federal funds are targeted at districts with below-adequate funding in states that are either paying their “fair shares” in state and local revenue based on their capacity or make progress toward achieving a reasonable minimum state and local effort level. We have shown elsewhere

that such an approach, thanks to recent advances in data availability and modeling, is now a real possibility (Baker, Di Carlo, and Weber 2022).

- This kind of federal program, while admittedly ambitious, would not only ensure that federal aid is targeted at states and districts where it is most needed, but might also provide some incentive for states to boost their own effort levels, which, as we’ve shown, are at their lowest levels in decades.

**Enhance federal monitoring of school funding adequacy, equity, and efficiency.** The federal government has long played a productive role in collecting and disseminating education data. The data we use to evaluate state systems in the SFID is mostly collected by the federal government, and the U.S. Department of Education has quite robust analytical capabilities.

- We recommend that the Department of Education establish a national effort to analyze the adequacy and equity of states’ systems, and provide guidance to states as to how they might improve their systems.
- This would include estimation and publication of measures such as wage adjustment indices and compilations of nationally normed outcome measures such as those published by the Stanford Education Data Archive, annual estimates of costs such as those of the NECM, and periodic (e.g., five-year) evaluation of adequacy and equity in states’ finance systems.
- It should also include evaluations of the overall efficiency of state and local spending (using NECM-style cost models), as well as of specific policies and practices on which new funding might be spent.
- Finally, the annual collection of local education agency finance data (the F-33 survey), which is carried out by the U.S. Census Bureau and published by the National Center for Education Statistics, should include public schools run by independent nongovernment entities (most notably charter schools).

## 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: fiscal effort, statewide adequacy, and equal opportunity. 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 comparatively abundant relative to costs. In the other, we find districts serving higher-poverty residents, whose schools receive only about 85 percent of the funding they need to achieve the relatively modest goal of national average test scores. And, in some states, even lower-poverty districts are funded below estimated adequate levels.

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.

For instance, the typical state is devoting a smaller share of its economic capacity to public schools than it did in 2006 (and earlier), and is not distributing those funds commensurately with costs. It is hardly surprising that we find widespread inadequate funding in many states, and at least moderately unequal opportunity in all states. 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.

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.

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## 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 (U.S. Census Bureau 2022) <a href="https://census.gov/programs-surveys/gov-finances.html">https://census.gov/programs-surveys/gov-finances.html</a>
	Gross state product and aggregate state personal income	U.S. Bureau of Economic Analysis <a href="https://bea.gov">https://bea.gov</a>
Statewide adequacy and equal opportunity	Estimated required and actual spending, by district (aggregated to state level). <b>NECM variables include:</b>	<b>National Education Cost Model (NECM)<sup>1</sup></b>
	Nationally normed test scores (2009-19)	Stanford Education Data Archive (Reardon et al. 2021) <a href="http://purl.stanford.edu/db586ns4974">http://purl.stanford.edu/db586ns4974</a>
	Regional wage variation	Education Comparable Wage Index (Taylor 2014; Taylor, Fowler, and Schneider 2006) <a href="https://bush.tamu.edu/research/taylor-cwi">https://bush.tamu.edu/research/taylor-cwi</a>
	Child poverty (5- to 17-year-olds)	U.S. Census Bureau—Small Area Income and Poverty Estimates (SAIPE) (U.S. Census Bureau 2021b) <a href="https://census.gov/programs-surveys/saipe.html">https://census.gov/programs-surveys/saipe.html</a>
	K-12 revenue and spending	NCES CCD Public Elementary-Secondary Education Finance Survey (F33) (National Center for Education Statistics 2021a) <a href="https://nces.ed.gov/ccd/files.asp">https://nces.ed.gov/ccd/files.asp</a>
	District size/enrollment	NCES Common Core of Data—Local Education Agency Universe Survey (National Center for Education Statistics 2021b) <a href="https://nces.ed.gov/ccd/files.asp">https://nces.ed.gov/ccd/files.asp</a>
	Population density	U.S. Census Bureau—Population Estimates (U.S. Census Bureau 2021a) <a href="https://census.gov">https://census.gov</a>

**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>).

<sup>1</sup> 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. IPERCENTAGE DIFFERENCE BETWEEN ACTUAL SPENDING AND ESTIMATED SPENDING REQUIRED TO ACHIEVE U.S. AVERAGE TEST SCORES, BY STATE AND DISTRICT POVERTY, 2020**

State	District poverty quintile				
	Lowest	Low	Medium	High	Highest
Alabama	6.4%	-23.7%	-24.9%	-43.9%	-51.9%
Alaska	95.8	42.0	33.9	123.0	29.9
Arizona	-6.1	-29.7	-33.0	-39.8	-33.9
Arkansas	-4.6	-13.7	-28.8	-33.3	-43.7
California	13.3	-8.3	-16.0	-17.7	-25.4
Colorado	28.1	11.2	-8.0	-22.1	-18.4
Connecticut	223.5	197.5	171.9	109.5	19.3
Delaware	14.4	27.4	6.3	-4.5	-18.6
District of Columbia	n/a	n/a	n/a	n/a	10.0
Florida	-11.5	-16.0	-20.9	-30.0	-30.3
Georgia	-9.8	-12.7	-31.2	-33.9	-42.7
Hawaii	n/a	n/a	n/a	n/a	n/a
Idaho	9.0	-11.8	-14.0	-24.3	-20.6
Illinois	120.6	53.3	36.5	7.2	-7.9
Indiana	52.6	27.1	0.1	-2.6	-24.1
Iowa	80.8	40.5	22.7	3.5	-16.1
Kansas	91.6	47.7	21.3	10.1	-12.3
Kentucky	33.6	17.9	8.5	-3.6	-19.0
Louisiana	3.5	-14.6	-25.9	-27.0	-42.7
Maine	178.9	86.9	41.6	44.4	4.0
Maryland	44.3	17.1	-10.4	44.3	-23.3
Massachusetts	148.3	119.5	89.2	68.1	8.8
Michigan	63.5	22.0	2.5	-9.2	-33.8
Minnesota	79.3	35.9	23.1	8.0	-8.9
Mississippi	-17.7	-28.7	-41.8	-48.0	-55.4
Missouri	50.0	16.0	-15.0	-25.5	-35.2
Montana	40.9	46.0	31.9	16.8	-2.8
Nebraska	71.8	37.9	20.1	-11.0	30.9
Nevada	-3.2	30.1	19.2	19.2	-31.3
New Hampshire	151.3	142.0	102.5	71.0	20.6
New Jersey	138.2	110.4	79.3	50.1	19.0
New Mexico	-3.1	-15.6	-8.9	-8.8	-30.6
New York	264.2	159.5	102.4	90.7	30.3
North Carolina	-13.7	-27.4	-28.7	-38.7	-42.9
North Dakota	46.7	63.5	48.9	31.1	25.7
Ohio	116.3	52.9	34.4	16.5	-18.7
Oklahoma	34.2	-2.7	-14.9	-22.1	-32.4
Oregon	32.4	23.7	7.6	-5.6	1.7
Pennsylvania	151.5	90.9	53.7	33.6	-16.2
Rhode Island	202.1	146.2	132.6	71.3	-5.2
South Carolina	-3.0	-13.1	-16.4	-27.2	-36.6
South Dakota	32.0	11.2	20.7	-10.8	-6.8
Tennessee	26.3	-9.8	-0.4	-1.8	-44.4
Texas	-11.6	-28.0	-27.6	-39.6	-42.4
Utah	23.1	17.9	-15.9	1.2	-3.6
Vermont	n/a	n/a	n/a	n/a	n/a
Virginia	22.9	10.1	15.6	-16.6	-27.1
Washington	59.7	39.8	8.5	8.7	-15.8
West Virginia	46.1	42.3	28.8	24.0	13.9
Wisconsin	91.9	49.6	37.5	14.1	-20.6
Wyoming	160.7	133.5	100.1	88.5	81.5

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 the District of Columbia. The district poverty quintiles calculated state by state use U.S. Census Bureau data (poverty among 5- to 17-year-olds).





$$\begin{aligned} (\ln)\text{SCHOOL} = & b_0 + b_1\text{State}_i + b_2\text{LaborMarket}_{ij} + \\ & b_3\text{CWI}_{ij} + b_4\text{FINANCE}_{ij} + b_5\text{PopulationDensity}_{ij} + \\ & b_6 \text{Enrollment}_{ij} + b_7\text{INDICATORS}_{ij} + b_8\text{Scale}_{ij} + \\ & b_9\text{Poverty}_{ij} + b_{10}\text{SchlType}_{ij} + b_{11}\text{DATABASE}_{ij} + e \end{aligned}$$