$$(In)SCHOOL = b_0 + b_1State_i + b_2LaborMarket_{ij} + b_3CWI_{ij} + b_4FINANCE_{ij} + b_5PopulationDensity_{ij} + b_6 Enrollment_{ij} + b_7INDICATORS_{ij} + b_8Scale_{ij} + b_9Poverty_{ij} + b_{10}SchlType_{ij} + b_{11}DATABASE_{ij} + e$$

STATE SCHOOL FINANCE PROFILE

2019-20 SCHOOL YEAR

MASSACHUSETTS

Summary: This 2019-20 profile of Massachusetts's public K-12 school finance system focuses on three core indicators from the School Finance Indicators Database: fiscal effort, statewide adequacy, and equal opportunity. On a weighted average of these three measures (see back), Massachusetts scores 45 out of 100, which ranks 28th out of the 48 states with possible ratings.

CONTEXTUAL STATS	MA	U.S.
Child (5-17yo) poverty rate (%)	10.5	14.9
Public school coverage (%)	85.9	83.1
Percent revenue from state sources	42.4	47.0
Total enrollment (U.S. rank)	959,394	(17)

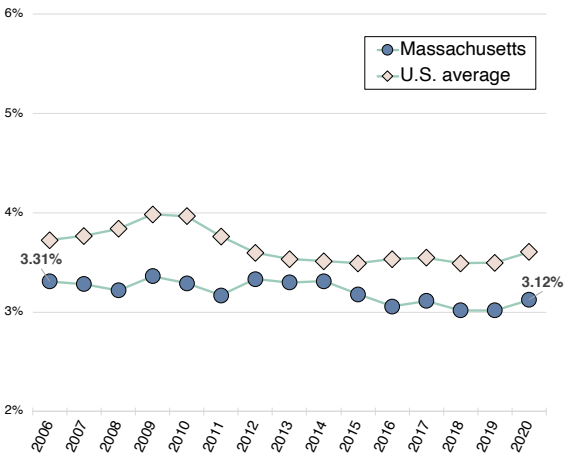
FISCAL EFFORT

Fiscal effort is a measure of how much states devote to their schools as a share of their economic capacity (i.e., ability to raise revenue). Effort is calculated by dividing direct state and local K-12 expenditures in each state by its gross state product (GSP).

Massachusetts effort	3.12 %
U.S. average	3.61 %

- MA is a low effort state.
- In FY 2020, MA spent 3.12 percent of its economic capacity (GSP) on its K-12 public schools.
- This was 0.48 percentage points lower than the unweighted national average of 3.61 percent.
- MA's effort level ranks #42 in the nation (out of 50).

K-12 FISCAL EFFORT TREND, 2006-20



Effort trend and capacity

- MA's 2020 effort level is 0.19 pct. points lower than it was pre-recession (2006).
- This net change in effort between 2006 and 2020 is ranked #29 in the nation.

Net change by period (% pts.)		
Period	**MA**	**U.S.**
K-12 recession (2006-12)	0.02	-0.13
Post-recession (2012-20)	-0.21	0.01
Full period (2006-20)	-0.19	-0.12

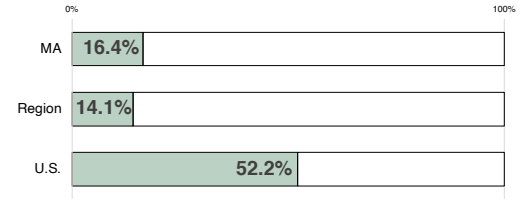
- MA's effort was lower than its 2006 level in 5 of 5 years between 2016-2020; had effort recovered to its 2006 level during these years, total 2016-20 spending would have been $6.66 billion (7.9 percent) higher.
- MA is a relatively high capacity state, with a GSP per capita ranked #3 in the nation.

STATEWIDE ADEQUACY

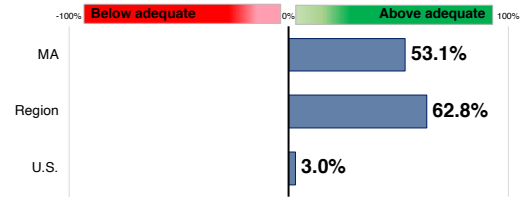
Statewide adequacy compares actual per-pupil (PP) spending in each state to district-level cost model estimates of the amount required to achieve the modest goal of U.S. average test scores. The graphs to the right indicate the percentage of students in districts where spending is below adequate and the funding gap (% above/below) in the typical student's district. The graphs include regional and national averages.

- Overall adequacy in MA is relatively high.
- By the modest standard of U.S. average scores, 16.4 percent of MA students attend inadequately funded districts, which ranks #12 in the nation (out of 49).
- The typical MA student's district spends 53.1 percent above adequate levels, which ranks #8 in the nation.

PCT. OF STUDENTS IN BELOW ADEQUATE DISTRICTS



ADEQUATE FUNDING GAP OF TYPICAL STUDENT



Adequacy in 10 largest MA districts

Percent above/below adequate spending, ten largest MA school districts	
BOSTON	18.9
WORCESTER	-14.0
SPRINGFIELD	-11.5
LYNN	-1.2
BROCKTON	-20.0
LOWELL	-0.9
LAWRENCE	-7.0
NEW BEDFORD	-10.8
NEWTON	139.1
FALL RIVER	0.2

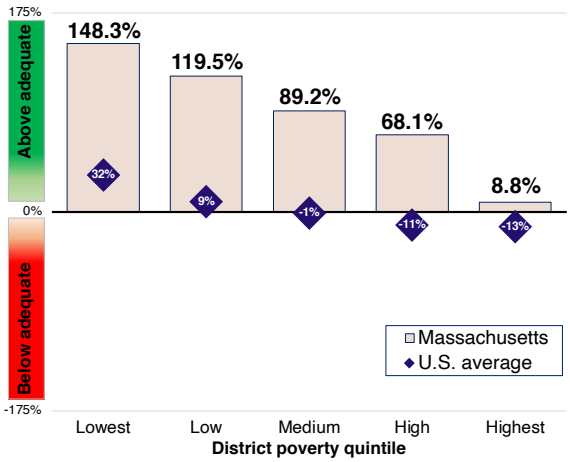
- Statewide, spending is below estimated adequate levels in 11 of the 288 MA districts with available data.
- Closing all these negative gaps would require $287.3 million in new funding.

EQUAL OPPORTUNITY

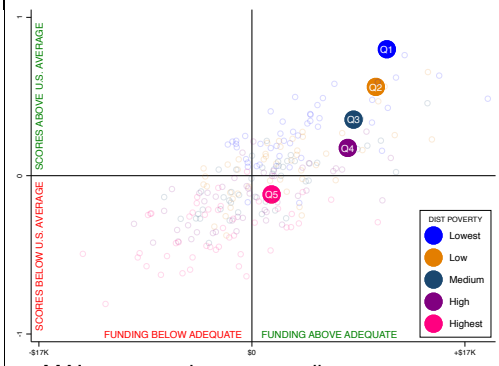
Equal opportunity is the comparison of adequacy between each state's higher- and lower-poverty districts. The graph to the right presents adequate funding gaps by district poverty quintile (the blue diamonds are U.S. averages). The difference (in pct. points) between the lowest- and highest-poverty groups is a state's "opportunity gap."

- Educational opportunity in MA is severely unequal.
- Spending in MA's highest-poverty districts is 8.8 percent ($1,570 PP) above the estimated adequate level, compared with 148.3 percent ($10,768 PP) above adequate in the state's most affluent districts.
- This opportunity gap of -139.5 percentage points is ranked #43 in the nation (out of 48).

ADEQUACY BY DISTRICT POVERTY



Adequacy gaps by outcome gaps



- MA's opportunity gap contributes to a student outcome gap: the state's highest-poverty districts (pink dot) score 0.92 s.d. below its lowest-poverty districts (blue dot).

$$(In)SCHOOL = b_0 + b_1State_i + b_2LaborMarket_{ij} + b_3CWI_{ij} + b_4FINANCE_{ij} + b_5PopulationDensity_{ij} + b_6 Enrollment_{ij} + b_7INDICATORS_{ij} + b_8Scale_{ij} + b_9Poverty_{ij} + b_{10}SchlType_{ij} + b_{11}DATABASE_{ij} + e$$

NOTES ON DATA AND MEASURES

State School Finance Profiles 2019-20 (publ. 2022)

General

The data in this state profile are from the **School Finance Indicators Database** (SFID), a collection of public K-12 school finance and resource allocation indicators published annually by researchers from the **Albert Shanker Institute**, **University of Miami School of Education and Human Development**, and **Rutgers University Graduate School of Education**. The primary product of the SFID is the State Indicators Database (SID), a state-level dataset containing roughly 125 variables. This profile focuses on three types of measures included in the SID: **fiscal effort**, **statewide adequacy**, and **equal opportunity**. The full SID dataset, along with accessible documentation of and data sources for all the measures presented in this profile, as well other SFID datasets, tools, and reports, are freely available to download at: schoolfinancedata.org. The following are some general notes about the profiles, followed by descriptions and notes pertaining to the three types of measures they present:

- The years in the profile refer to the spring semester of the school year (e.g., 2020 is 2019-20).
- Estimates may differ slightly from previous profiles, as some measures are changed or improved each year, and all years are recalculated annually with updated data.
- Due to rounding, changes and differences published in this profile may vary slightly from users' manual calculations of the estimates on the front side.
- The total number of states assigned rankings varies slightly by measure, as not all measures are available in all states.
- **Overall state scores**: The overall scores reported at the top of the profile provide a very simple summary of states' combined "performance" on the three core indicators featured in the profiles. They do not represent comprehensive evaluations of states' school finance systems. Each state is scored entirely relative to other states (i.e., rather than based on some absolute standard of "good" or "bad"), and the selection/weighting of components entails subjective judgments on the part of the SFID research team.
  - The scores are calculated as a weighted average of z-scores (final averages expressed as percentile equivalents, with a score of 50 = z-score of 0) of the following measures (weights in parentheses): 1) percent of students in districts with above adequate funding (22.5%); 2) statewide (%) adequacy gap (22.5%); 3) GSP-based fiscal effort (15%); 4) personal income-based fiscal effort (15%); and 5) equal opportunity gap (Q5/Q1 difference in adequacy gap, in percentage points) (25%). State rankings may reflect differences in unrounded scores.
  - D.C., Hawaii, and Vermont are not assigned scores, as one or more of the measures that constitute the scores cannot be calculated for these states.
- **Non-SFID data sources** ("Contextual Stats" table): 1) Child (5-17 year old) poverty (2020) from the U.S. Census Bureau's Small Area Income and Poverty Estimates (SAIPE) program; 2) see SID documentation for sources used for public school coverage estimates; 3) percent of total (FY 2020) revenue from state sources from the U.S. Census Bureau Annual Survey of School System Finances; 4) total state public elementary and secondary school enrollment (Fall 2019) from the *2020 Digest of Education Statistics*, published by the National Center for Education Statistics.

Fiscal effort

SID variables used in this section: *effort*; *year*

Fiscal effort indicates how much of a state's total economic capacity goes toward K-12 schools. It is calculated in the SFID by dividing direct state and local K-12 expenditures by either Gross State Product (GSP) or aggregate state personal income. Both of these are measures of a state's economic capacity. In this sense, effort measures how much each state contributes as a percentage of how much it *might* contribute. The former denominator (GSP) is used in these profiles, but the two are highly correlated, and the income-based effort indicator is available in the SID. Bear in mind that high-capacity states with larger economies, such as New York and California, can put forth lower effort than lower capacity states, such as Mississippi and Alabama, but still produce the same funding. We therefore use effort primarily as a means of differentiating between low/inadequate funding states that do and do not have the capacity to increase revenue.

- U.S. effort averages are unweighted and do not include Vermont in any year (effort not available in 2018-20 due to data irregularities), so as to keep a consistent set of states across all years. In the first bullet of the left panel, we characterize each state's effort level as low, medium, or high by sorting states into three roughly equal groups using terciles. Note that even seemingly small changes or differences in effort levels represent large revenue amounts, as the denominators are entire state economies. Note also that 2006 is the first year in which we can calculate GSP-based fiscal effort, as quarterly GSP estimates are not available before that.
- The table in the right panel summarizes the center-panel graph, with a focus on effort trends before and after the 2007-09 recession. The 2006-12 period (the "K-12 recession") is highlighted in the table (rather than, say, 2006-09) because the direct impact of the recession on K-12 funding in the typical state persisted for a few years after the "official recession" ended, and because federal stimulus funds ran out after 2011. 2012 is therefore an apt starting point for assessing states' reinvestment (or lack thereof). Trends, however, vary by state.
- In the third bullet of the right panel, below the table, we present a "thought experiment" of sorts, in which we calculate how much additional total state and local spending each state would have had between 2016 and 2020 had that state returned to its own pre-recession (2006) effort level by 2016 (with 2012-2016 representing a reasonable time period for full recovery). For each state/year combination in which 2016-20 effort exceeded the state's 2006 level, the hypothetical additional spending is zero (i.e., the hypothetical additional funding estimates do not include years in which 2016-20 funding would have been lower under states' 2006 effort levels).
- In order to provide a sense of states' capacity, we characterize each state's GSP per capita as small, medium, or large by sorting states into three roughly equal groups using terciles.

Statewide adequacy

SID variables used in this section: *necm_predcost_state*; *necm_ppcstot_state*; *necm_enroll_state*

Adequacy is typically defined as the extent to which the amount of funding for schools is sufficient for students to reach a minimum/acceptable level of educational outcomes. Our adequacy estimates compare each district's actual spending levels to estimates from cost models of how much that district *would have to spend* in order to achieve national average test scores (i.e., "required" or "adequate" spending). We express statewide adequacy in terms of either: 1) the proportion of students in each state in districts with actual funding below estimated adequate levels; and 2) the adequacy gap (percentage difference between actual and estimated adequate spending) for the typical student in each state. All these estimates are from the National Education Cost Model (NECM), which is part of the SFID. The NECM calculates required spending based on the relationship between outcomes and cost factors such as regional wage variation, district size, and student characteristics. Note that this model and the data it uses are necessarily imperfect, and estimates should be viewed with appropriate caution. For more information about the NECM, see the SID user's guide. Some of the estimates presented in this section of the profile can be calculated using SID variables, whereas others (e.g., the district-by-district estimates in the right panel) require use of the SFID's District Cost Database (DCD); many but not all SID adequacy measures (all of which have variable name beginning with necm_) are aggregations of DCD estimates. The full DCD dataset (going back to 2009) is also publicly available at the SFID website (2020 estimates will be released in early 2023).

- Statewide adequacy estimates are not available for Hawaii in all years (due to it being a geographically isolated, single-district state), and for Vermont between 2017 and 2020 (due to data irregularities). Estimates for D.C. apply to a single school district (District of Columbia Public Schools).
- In the first bullet of the left panel, we characterize statewide adequacy as follows: high (fewer than 20 percent of students in below-adequate districts and statewide [typical student's] gap of +50 percent or greater); moderate (greater than 20 percent below adequate and statewide gap under +50 percent OR fewer than 20 percent below adequate and statewide gap above +50 percent); high (greater than 50 percent in below adequate districts).
- The regional comparisons in the graphs in the middle panel are U.S. Census divisions (9 groups). MA's division is New England. Axis ranges for the bottom graph may vary by state.
- The table in the right panel presents adequacy estimates (percentage difference between actual and estimated adequate spending) for the 10 largest (enrollment) districts in this state.
- The first bullet directly below the table presents the number of districts with below adequate funding as well as the total number of districts in this state with valid estimates. The second bullet presents the total additional funding that would be required to close all these negative funding gaps ("ignoring" all districts in which actual spending exceeds adequate levels).

Equal opportunity

SID variables used in this section: *necm_predcost_q1—q5*; *necm_ppcstot_q1-q5*; *necm_enroll_q1-q5*; *necm_outcomegap_q1-q5*

Equal educational opportunity is achieved in a given state when none of that state's districts are substantially further above or below adequate spending levels than are other districts. In the SFID, we measure equal opportunity (EO) with the same NECM estimates used for statewide adequacy (see above), but in this case by comparing adequacy gaps (percentage difference between actual and estimated adequate spending) between the highest- and lowest-poverty districts in each state. That is, each state's "opportunity gap" is the difference (in percentage points) between these two groups (district poverty groups are defined in terms of quintiles—e.g., the 20 percent highest-poverty districts compared with the 20 percent lowest-poverty districts in each state). Note that EO is conceptually independent of statewide adequacy—e.g., a hypothetical state in which all districts are below adequate funding levels might still exhibit EO, so long as high- and low-poverty districts are inadequate by roughly the same proportions, whereas highly unequal opportunity might exist in a state in which funding is universally adequate, if high-poverty districts are more adequately funded than lower-poverty districts.

- EO estimates are not available for Vermont and Hawaii (adequacy estimates not available), and cannot be calculated for D.C. (single government-run district state).
- In the first bullet of the left panel, we characterize EO in each state as follows: severely unequal (EO gap less than -75 points); highly unequal (EO gap between -30 and -75 points); moderately unequal (EO gap above -30 points).
- The center panel figure presents adequate funding gaps for all five quintiles in each state (although opportunity gaps as we define them for the purposes of this profile use only the highest- and lowest-poverty groups, this graph permits comparison of gaps between different combinations of groups). The state (bars) and U.S. (blue diamonds) estimates in the graph are average differences between actual and required spending (weighted by enrollment), by district poverty quintile. Note, however, that poverty quintiles are defined state by state, and so the U.S. averages (blue diamonds) represent an approximation of the national situation. Axis ranges for this graph may vary between states.
- The scatterplot in the right panel presents, by district poverty quintile, adequacy (difference between actual and required spending) expressed in dollars per pupil (horizontal axis) by average student testing outcomes expressed as the difference from the national average in standard deviations (vertical axis). The other markers (circles) in the plot are other states' district poverty groups (color coded in the same manner, but with more transparent markers to allow for clear viewing of this state's markers). The difference in student outcomes between the highest- (Q5) and lowest-poverty (Q1) estimate is presented in the first bullet, below the plot, and can be interpreted as a poverty-based student achievement gap in this state.