



Student Impact Project Grading System Methodology

Examining the relationship between college affordability and state budgets requires more than comparing the national means of state higher education budgets. States vary too widely on key indicators such as per student appropriations, tuition increases, and financial aid to get a clear picture of the budgetary mechanics of public higher education. The diversity of these variables also makes it difficult to assign ordinal ranks to states as it is difficult to prioritize one variable over another. Raw statistics on state budgets' support for higher education mean little without context of where a given value stands in relation to other states or a standard of how much states should fund public colleges, not to mention how the observation relate to itself through time.

To solve this problem, Young Invincibles developed an innovative scoring system to evaluate each state's support for public higher education. The system's scale converts a variable's value into a standardized unit to evaluate a state's performance in a fifty-state context. Baked inside these metrics are Young Invincibles organizational values: encouraging lower tuition at public institutions, higher state appropriations, lower student debt, and more direct state support to student grants and aid. In keeping with these values, states were evaluated using the following fifteen variables, organized into five categories of state budget support for higher education:

Tuition

Average tuition at four-year public colleges and universities

The percent change at four-year public colleges and universities since the recession

Average tuition at two-year public colleges and universities

The percent change at two-year public colleges and universities since the recession

State Budget Appropriations

Dollars per FTE appropriated to higher education¹

Five-year percent change in state appropriations to higher education

Burden on Families

Average family share (Net tuition revenue per FTE as percentage of total revenue)

Percent change in average family share since the recession

Tuition as a percentage of statewide median income

Direct aid to students

Dollar amount of grants and aid awarded per FTE

¹ Full-time equivalent, or FTE, captures the number enrolled students, with part-time students weighted appropriately.



Dollar amount of need-based grant and aid awarded per FTE
Grants as a percentage of total higher education percentages
Average net tuition

Education as a priority

Appropriations to higher education as a percentage of total state budget
Four-year percent change in higher education appropriations as a percentage of total state budget

Analysis

To evaluate each state within a useful context, a constant had to be generated to place the state's performance in proper context. If states were scored entirely by their deviation from the data set's mean and assigned Z-scores, the top portion of the dataset would be given top grades, despite many state's actions being simply less unacceptable than the others. In short, because the recent trend for all of these variables has been undesirable, a different constant that took into account the poor trends in state budget support for higher education had to be generated.

Young Invincibles generated a plausible baseline value for each variable. These baselines were considered to be a 75 percent or "C" score. A brief explanation of how each baseline is listed below:

- Average tuitions were set to the national mean.
- Percent tuition increases since the recession were set to inflation for that time period, from 2007 to 2013 (12.4 percent).
- The value for per student state appropriations was set to the national mean.
- Percent change in state appropriations per student was set to zero.
- Family share was set to the current national mean (50 percent).
- Percent change in family share since the recession was set to zero.
- Tuition as a percentage of median income was set to the national mean.
- The value for Grants per FTE was set to the national mean.
- Percent of state appropriations allocated for grants was set to the national mean.
- Average amount of grants in dollars was set to the national mean.
- Average student debt was set to the national mean.
- Education expenditures as a percent of total state expenditures was set to the national mean.
- 4-year change to education expenditures as a percentage of total state expenditures was set to zero.

After setting the baseline, for each variable a "low" observed value (minimum or maximum depending on whether the variable was desirable like state appropriations or non-desirable such as tuition) was set to zero. This was done not only to avoid assigning negative scores, but also to provide the evaluation with a



workable scale. Based on this 75 percent score and the zero score, we calculated a “unit” value, or how many dollars or percentage points were the equivalent to one percent in the grading system.

$$Unit = \frac{(Low - Baseline)}{75}$$

Once the “unit” values generated for each variable, the “one hundred percent” score was derived by extrapolating 25 “units” from the baseline. For variables where a higher value is desirable, such as state appropriations, the “one hundred ideal” value was derived from the below formula.

$$Ideal = Baseline + (25 * Unit)$$

For variables where a lower value was desirable, like tuition:

$$Ideal = Baseline - (25 * Unit)$$

Each states’ value in that variable was then judged relative to this ideal score, converted into our standard units.

$$Score = \left(\frac{-(Ideal - x)}{Unit} \right) + 100$$

For variables where a lower value was desirable, like tuition:

$$Score = \left(\frac{Ideal - x}{Unit} \right) + 100$$

As an example, take since recession tuition changes: Between the 2007 and 2013 school years, tuition increased by an average of 37 percent. The range of increases spread from Maryland’s 3 percent increase to Arizona’s 81 percent increase. That 37 percent mean is not an acceptable baseline for advocates of affordable public higher education.

To solve for this, YI assumed that an “ideal” result would be for tuition increases to match the rate of inflation for that time period, or 12.4 percent. Therefore, states that increased tuition by 12.4 percent would be given a 75 percent, or a letter grade of “C”. Arizona, the state with the nation’s highest tuition increases, was assigned a zero. With these score assigned, a standard unit of 1.1% was derived. In other words, a 1 percent increase in tuition above the 12.4 percent baseline resulted in a 0.9% reduction in score from the 75% baseline. Pennsylvania’s 17 percent tuition increase (above our baseline of inflation growth) generates a score of 70.4 percent.



The “Final Grade” for each state represents a simple average of all five categories scores, with the exception of average student debt for Alaska, Delaware, and New Mexico due to lack of data for those states.

Data Sources

Data was sourced from a variety of nonprofit and trade association groups. College Board tracks trends in tuition and their 2014 report was used for all tuition values. The State Higher Education Executive Officer’s Association publishes the SHEF (State Higher Education Finances) dataset annually and state appropriations to higher education data was derived from here. The National Association of State Student Grant and Aid Programs’ (NASSGAP) publishes state-by-state data on funding for student scholarships, grants, and financial aid. The Project on Student Debt publishes the average amount of student debt held in each state. The National Association of State Budget Officers publishes data on expenditures for higher education as a percentage of total state expenditures.