
TECHNICAL PAPER B

Adjusting for Interstate Differences in Cost of Living and Enrollment Mix

As discussed in the introductory essay, "Making Sense of Higher Education Interstate Finance Data," it is difficult to compare interstate higher education unit costs. The analytical tools available are, at best, blunt instruments for measuring differences. Nevertheless, blunt instruments can be better than no instruments at all. This essay describes two approaches for assessing the relative significance of two factors—cost of living and the enrollment mix among institutions.

The cost of living among (and within) the states differs dramatically. The most significant difference is median housing values—in the 2000 census these were \$119,600 for the nation, but ranged from \$72,800 to \$273,000 among states.

Enrollment mix also poses a challenge for interstate financial comparisons. Each level of higher education, from the lowest undergraduate work through doctoral studies, is progressively more expensive. A state or institution with a large proportion of enrollments in graduate programs will have a higher cost per FTE student than will a state or institution with a larger proportion of enrollments in undergraduate programs.

Both the State Higher Education Finance (SHEF) report and its predecessor, Kent Halstead's *State Profiles: Financing Public Higher Education*, provide a means of approximating the effects of these factors on interstate financial comparisons.

Halstead's System Support Index (SSI)

Kent Halstead's series of publications use an index that compares each state's cost per FTE student adjusted by a factor he called the System Support Index (SSI). The SSI adjusted for cost of living differences based on the prevailing wages of the county in which each institution was located, and for differences in the enrollment mix by examining average costs for institutions of various sizes in each Carnegie Classification. A combination of these two factors was used to calculate the SSI.¹

While the SSI offers an elegant analytical effort, it has several disadvantages:

- It requires matching county level wage rates to institutional financial data, and entails a complex analysis of institutional enrollments, sizes, and expenditures.
- While local wage rates may be correlated with cost of living, they are not a direct measure of the cost of living or of the cost of employing college and university faculty in a particular county.
- The approach used for calculating the effects of enrollment mix and cost of living in the SSI makes it impossible for an independent observer to replicate the results, search for computational errors, or critically assess the analytical technique.

¹ Halstead, K. (1998). "State Profiles: Financing Public Higher Education 1998 Rankings" (pp. 8-9, 43-44). Washington, DC: Research Associates of Washington.

SHEF Adjustments for Cost of Living and Enrollment Mix

The SHEF report provides separate analytical adjustments for each of these factors. The adjustment for interstate cost of living differences is drawn from the Berry index (a study by Berry et al. that provides a single index for each state).² While this index does not solve the problem of differing intrastate costs of living, it offers a way to get a rough estimate of these differences for adjusting interstate unit cost data. The range of values extends from .88 to 1.16 among the forty-eight contiguous states. The Berry index does not provide an estimate of cost of living in Alaska and Hawaii, two states with unique characteristics. In the SHEF analysis, the highest value of 1.16 is assigned to both states.

SHEEO has developed an adjustment for intrastate enrollment mix differences based on the proportion of enrollments in each state compared with the national proportion of enrollments (by Carnegie Classification). The essential steps are as follows:

1. Integrated Postsecondary Education Data System (IPEDS) data for fiscal 2001 were used to develop a national average cost per FTE for each of the Carnegie Classifications of institutions. In addition, an aggregated national cost per FTE was calculated to be \$9,662. The average national cost per FTE reflects the national enrollment mix among sectors, the most common of which are: Doctoral Research Extensive (\$12,661); Doctoral Research Intensive (\$10,315); Masters Colleges and Universities I (\$9,160); and Associate Colleges (\$7,688).
2. The proportion of each state's FTE in each of the Carnegie Classifications was calculated, and then multiplied by the national average cost per FTE for each respective classification. The sum of these products (the total state FTE for classification [j] multiplied by the national average unit cost for classification [j]) yields a number greater or less than \$9,662, depending on the state's enrollment mix. This number is designated the state's enrollment mix unit cost. If the state has relatively more enrollments in higher cost Carnegie Classifications (e.g., research universities) the enrollment mix unit cost will surpass the aggregated national unit cost. If the state has relatively more enrollments in lower cost Carnegie Classifications (e.g., community colleges) the enrollment mix unit cost will be less than the aggregated national unit cost.
3. The ratio of enrollment mix unit cost to aggregated national unit cost constitutes each state's enrollment mix "index." For example, the enrollment mix index for California equals 0.92 because California has a large community college system. This calculation illustrates that, if unit costs in each sector were at the national average, the statewide cost per FTE would be lower than the aggregated national unit cost by eight percent.

Each SHEF adjustment is expressed in index values where the national average equals 1.00. Hence, actual expenditures per FTE are divided by the SHEF adjustment in order to obtain the adjusted value. For example, presume that State X has an actual expenditure per FTE of \$8,000. If the cost of living index for State X equals 1.05, its expenditure per FTE, adjusted for differences in the cost of living, would be \$7,619 ($\$8,000 / 1.05$). If State X has an enrollment mix index of 0.98, its expenditure per FTE, adjusted for differences in enrollment mix, would be \$8,163 ($\$8,000 / .98$). When both adjustments are made, State X would have an adjusted expenditure per FTE of \$7,775 ($\$8,000 / 1.05 / .98$).

Table 8 summarizes results for the SHEF adjustments for interstate cost of living and enrollment mix differences, and compares these adjustments with the most recent Halstead SSI. SHEEO welcomes comments on the utility and limitations of these analytical tools and any suggestions for improvement.

² Berry, W.D., R.C. Fording, and R.L. Hanson. (2000). An annual cost of living index for the American state, 1960-1998. "Journal of Politics," 62 (2), 550-567.

Table 8**Comparison of SHEEO Enrollment Mix and Cost of Living Indices to the Halstead System Support Index**

State	Enrollment Mix ¹	State Cost of Living ²	Combined	Halstead SSI ³
Alabama	0.93	0.91	0.85	0.97
Alaska	0.99	1.16	1.15	1.50
Arizona	1.03	0.94	0.97	1.00
Arkansas	0.98	0.89	0.87	0.91
California	0.92	1.02	0.94	1.03
Colorado	1.04	1.02	1.06	1.06
Connecticut	1.00	1.16	1.16	1.22
Delaware	1.15	1.00	1.16	1.16
Florida	1.02	0.93	0.95	0.84
Georgia	1.03	0.95	0.98	1.00
Hawaii	1.05	1.16	1.22	1.51
Idaho	1.04	0.92	0.96	1.02
Illinois	0.98	1.06	1.05	0.98
Indiana	1.10	1.01	1.11	1.05
Iowa	1.06	1.00	1.06	1.07
Kansas	1.06	1.01	1.06	1.00
Kentucky	1.03	0.91	0.94	1.03
Louisiana	1.03	0.91	0.93	0.97
Maine	1.01	1.02	1.03	1.01
Maryland	1.01	1.02	1.03	1.01
Massachusetts	0.98	1.16	1.14	1.11
Michigan	1.06	1.04	1.10	0.98
Minnesota	0.98	1.07	1.05	1.02
Mississippi	1.03	0.88	0.91	0.91
Missouri	0.97	1.01	0.98	0.99
Montana	1.02	0.90	0.93	1.00
Nebraska	1.03	1.01	1.04	1.02
Nevada	1.00	0.99	0.99	0.95
New Hampshire	1.11	1.09	1.21	1.00
New Jersey	0.96	1.14	1.09	1.08
New Mexico	1.06	0.91	0.96	1.19
New York	0.94	1.09	1.02	1.08
North Carolina	0.98	0.95	0.92	0.94
North Dakota	0.99	0.99	0.97	1.00
Ohio	1.08	1.02	1.10	1.02
Oklahoma	1.02	0.90	0.91	0.90
Oregon	1.02	0.98	1.00	0.99
Pennsylvania	1.05	1.02	1.07	1.07
Rhode Island	1.07	1.07	1.15	1.10
South Carolina	1.02	0.92	0.94	0.93
South Dakota	0.97	1.00	0.97	0.94
Tennessee	1.02	0.93	0.95	0.93
Texas	1.00	0.90	0.90	0.90
Utah	1.06	0.96	1.02	1.01
Vermont	1.16	1.04	1.20	1.32
Virginia	1.05	0.99	1.03	1.00
Washington	0.97	1.01	0.98	0.99
West Virginia	1.01	0.89	0.90	1.03
Wisconsin	1.02	1.04	1.06	0.95
Wyoming	1.05	0.92	0.97	1.11
U.S.	1.00	1.00	1.00	1.00

Source:

1. SHEEO, from IPEDS finance and enrollment data.
2. Updated values of index described in Berry, W.D., R.C. Fording, and R.L. Hanson. 2000. An annual cost of living index for the American states, 1960-1995. "Journal of Politics" 62 (2), 550-67.
3. Halstead, K. 1998. "State Profiles: Financing Public Higher Education 1998 Rankings." Washington, DC: Research Associates of Washington.