

TECHNICAL PAPER B

ADJUSTING FOR INTERSTATE DIFFERENCES IN COST OF LIVING AND ENROLLMENT MIX

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 technical paper briefly describes two approaches for assessing the relative significance of two factors—cost of living and the enrollment mix among institutions.

The cost of living varies greatly across the 50 states. The most significant difference is in median housing values. In the 2005 American Community Survey census, median housing value was \$167,500 for the nation, but ranged from \$84,400 to \$477,000 across different regions and 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 enrollment in graduate programs will normally have a higher cost per FTE than a state or institution with a larger proportion of enrollment in undergraduate and two-year degree programs.

SHEF ADJUSTMENTS FOR COST OF LIVING AND ENROLLMENT MIX

The SHEF report provides separate analytical adjustments for differences among the states in the cost of living (COLA: Cost of Living Adjustment) and the mix in enrollment among categories of institutions (EMI: Enrollment Mix Index). 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).¹ 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 0.88 to 1.22 among the 48 contiguous states in 2003, the most recent year available for these data.

The Berry index does not provide an estimate of cost of living in Alaska and Hawaii, two states with unique characteristics. Alaska is estimated to have a cost of living consistent with the highest cost of living in the contiguous 48 United States. As a result, in the SHEF analysis, the value of 1.22 (the highest value of the 48 contiguous states) is assigned to Alaska. The cost of living in Hawaii is about 30 percent higher than the average in the 48 contiguous United States.²

1. Berry, W.D., R.C. Fording, and R.L. Hanson. *Cost of Living Index for the American States, 1960-2003*. (Available at ICPSR Publication Related Archive, study # 1275 <http://www.icpsr.umich.edu/icpsrweb/DSDR/studies/1275>)

2. An examination of city-based cost of living adjustment factors resulted in assigning Hawaii a cost of living adjustment factor of 1.35. This is comparable to Boston's ACCRA cost of living adjustment, but lower than Honolulu's adjustment of 1.64. Honolulu's adjustment factor would not be appropriate because, while most of Hawaii's higher education is concentrated there, it is a disproportionately high cost area.

SHEEO has developed an adjustment for interstate enrollment mix differences based on the proportion of enrollment in each state compared with the national proportions of enrollment by Carnegie Classification for FY 2011 (the most recent finance data available at the time of data collection and analysis). The essential steps are as follows:

1. Integrated Postsecondary Education Data System (IPEDS) data were used to develop a national average cost per fall FTE for each of the Carnegie Classifications of institutions. This calculation used financial information from FY 2011 and fall 2010 FTE data.
2. The proportion of each state's FTE in each of the Carnegie Classifications was calculated for fall 2010, and then multiplied by the national average cost per FTE in FY 2011 for each respective classification. For each state, the products for each Classification were summed, which yields the state's enrollment mix unit cost for the year.

If the state has relatively more enrollment 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 enrollment 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 in FY 2011 equals 0.944 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 5.5 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 ($\$8,000 / 1.05 / .98$).

Technical Paper Table 2 shows the EMI, COLA, and combined EMI and COLA measures for each state. *Technical Paper Table 3* summarizes results for the SHEF adjustments for interstate cost of living and enrollment mix differences among the states. SHEEO welcomes comments on the utility and limitations of these analytical tools and any suggestions for improvement.

TECHNICAL PAPER TABLE 2
ENROLLMENT MIX INDEX AND COST OF LIVING ADJUSTMENTS BY STATE

	EMI ¹	COLA ²	EMI & COLA Combined
STATE			
ALABAMA	1.006	0.902	0.908
ALASKA	1.007	1.218	1.227
ARIZONA	1.069	0.964	1.031
ARKANSAS	1.001	0.887	0.888
CALIFORNIA	0.944	1.090	1.029
COLORADO	1.062	1.048	1.113
CONNECTICUT	1.020	1.202	1.226
DELAWARE	1.211	0.993	1.203
FLORIDA	1.022	0.921	0.941
GEORGIA	1.030	0.935	0.963
HAWAII	1.067	1.354	1.444
IDAHO	0.960	0.957	0.919
ILLINOIS	0.961	1.051	1.010
INDIANA	1.140	1.001	1.142
IOWA	1.058	0.995	1.052
KANSAS	1.006	0.999	1.005
KENTUCKY	1.024	0.905	0.927
LOUISIANA	1.015	0.901	0.915
MAINE	0.950	1.091	1.037
MARYLAND	0.983	0.999	0.981
MASSACHUSETTS	0.986	1.218	1.201
MICHIGAN	1.042	1.027	1.070
MINNESOTA	1.002	1.051	1.053
MISSISSIPPI	0.965	0.883	0.852
MISSOURI	1.002	0.997	1.000
MONTANA	1.110	0.951	1.056
NEBRASKA	1.045	1.011	1.056
NEVADA	0.941	1.014	0.954
NEW HAMPSHIRE	0.968	1.152	1.116
NEW JERSEY	0.964	1.193	1.150
NEW MEXICO	1.008	0.955	0.962
NEW YORK	0.963	1.146	1.104
NORTH CAROLINA	0.980	0.929	0.911
NORTH DAKOTA	1.105	1.002	1.107
OHIO	1.019	1.009	1.028
OKLAHOMA	0.999	0.886	0.886
OREGON	1.029	1.020	1.050
PENNSYLVANIA	1.039	1.068	1.109
RHODE ISLAND	0.955	1.149	1.098
SOUTH CAROLINA	0.993	0.915	0.909
SOUTH DAKOTA	0.992	1.007	0.998
TENNESSEE	1.004	0.913	0.917
TEXAS	0.973	0.886	0.862
UTAH	1.062	1.007	1.070
VERMONT	1.001	1.122	1.123
VIRGINIA	1.037	0.962	0.998
WASHINGTON	0.991	1.045	1.036
WEST VIRGINIA	0.972	0.892	0.867
WISCONSIN	1.006	1.031	1.037
WYOMING	0.905	0.966	0.875
U.S.	1.000	1.000	1.000

Notes:

1) Fall 2010 FTE data and FY 2011 financial data from IPEDS are used to produce Enrollment Mix.

2) As of 2003, obtained from Berry, 2003.

TECHNICAL PAPER TABLE 3

IMPACT OF ENROLLMENT MIX INDEX AND COST OF LIVING ADJUSTMENTS BY STATE

STATE	Total Educational Revenue per FTE UNADJUSTED		ADJUSTED FOR ENROLLMENT MIX		ADJUSTED FOR COST OF LIVING		ADJUSTED FOR ENROLLMENT & COLA	
	\$/FTE	% of U.S. Avg	\$/FTE	% of U.S. Avg	\$/FTE	% of U.S. Avg	\$/FTE	% of U.S. Avg
ALABAMA	13,549	110%	13,462	110%	15,024	122%	14,927	122%
ALASKA	23,267	190%	23,094	188%	19,102	156%	18,960	155%
ARIZONA	11,691	95%	10,937	89%	12,121	99%	11,339	92%
ARKANSAS	10,413	85%	10,406	85%	11,739	96%	11,731	96%
CALIFORNIA	9,872	80%	10,454	85%	9,059	74%	9,593	78%
COLORADO	12,396	101%	11,668	95%	11,833	96%	11,138	91%
CONNECTICUT	18,324	149%	17,956	146%	15,246	124%	14,941	122%
DELAWARE	22,681	185%	18,723	153%	22,838	186%	18,852	154%
FLORIDA	8,393	68%	8,216	67%	9,111	74%	8,919	73%
GEORGIA	11,322	92%	10,988	90%	12,114	99%	11,757	96%
HAWAII	16,684	136%	15,639	128%	12,322	100%	11,550	94%
IDAHO	10,348	84%	10,776	88%	10,819	88%	11,265	92%
ILLINOIS	18,699	152%	19,454	159%	17,799	145%	18,517	151%
INDIANA	13,346	109%	11,706	95%	13,327	109%	11,690	95%
IOWA	14,154	115%	13,381	109%	14,230	116%	13,453	110%
KANSAS	11,585	94%	11,517	94%	11,601	95%	11,533	94%
KENTUCKY	12,188	99%	11,899	97%	13,471	110%	13,151	107%
LOUISIANA	9,305	76%	9,169	75%	10,325	84%	10,174	83%
MAINE	15,188	124%	15,980	130%	13,926	114%	14,652	119%
MARYLAND	14,857	121%	15,117	123%	14,878	121%	15,139	123%
MASSACHUSETTS	13,213	108%	13,401	109%	10,847	88%	11,002	90%
MICHIGAN	16,833	137%	16,157	132%	16,385	134%	15,727	128%
MINNESOTA	13,100	107%	13,075	107%	12,463	102%	12,439	101%
MISSISSIPPI	9,325	76%	9,663	79%	10,564	86%	10,947	89%
MISSOURI	10,839	88%	10,812	88%	10,868	89%	10,841	88%
MONTANA	11,029	90%	9,933	81%	11,596	95%	10,444	85%
NEBRASKA	13,987	114%	13,391	109%	13,831	113%	13,241	108%
NEVADA	10,504	86%	11,167	91%	10,357	84%	11,011	90%
NEW HAMPSHIRE	13,628	111%	14,073	115%	11,830	96%	12,216	100%
NEW JERSEY	15,609	127%	16,193	132%	13,078	107%	13,568	111%
NEW MEXICO	11,343	92%	11,256	92%	11,880	97%	11,789	96%
NEW YORK	14,595	119%	15,159	124%	12,733	104%	13,225	108%
NORTH CAROLINA	11,729	96%	11,963	98%	12,627	103%	12,879	105%
NORTH DAKOTA	16,210	132%	14,669	120%	16,178	132%	14,640	119%
OHIO	11,982	98%	11,764	96%	11,875	97%	11,658	95%
OKLAHOMA	11,014	90%	11,020	90%	12,425	101%	12,432	101%
OREGON	11,326	92%	11,011	90%	11,100	90%	10,791	88%
PENNSYLVANIA	14,297	117%	13,764	112%	13,390	109%	12,890	105%
RHODE ISLAND	17,191	140%	17,995	147%	14,961	122%	15,661	128%
SOUTH CAROLINA	11,486	94%	11,568	94%	12,550	102%	12,639	103%
SOUTH DAKOTA	12,279	100%	12,382	101%	12,196	99%	12,298	100%
TENNESSEE	11,788	96%	11,735	96%	12,905	105%	12,848	105%
TEXAS	11,362	93%	11,672	95%	12,826	105%	13,175	107%
UTAH	11,103	91%	10,452	85%	11,020	90%	10,375	85%
VERMONT	17,199	140%	17,184	140%	15,333	125%	15,320	125%
VIRGINIA	12,390	101%	11,944	97%	12,873	105%	12,409	101%
WASHINGTON	11,345	92%	11,450	93%	10,855	88%	10,956	89%
WEST VIRGINIA	10,344	84%	10,642	87%	11,597	95%	11,930	97%
WISCONSIN	11,617	95%	11,549	94%	11,271	92%	11,205	91%
WYOMING	15,998	130%	17,670	144%	16,554	135%	18,284	149%
U.S.	12,266	100%	12,266	100%	12,266	100%	\$12,266	100%

Source: State Higher Education Executive Officers