Financial characteristics of broad access public institutions

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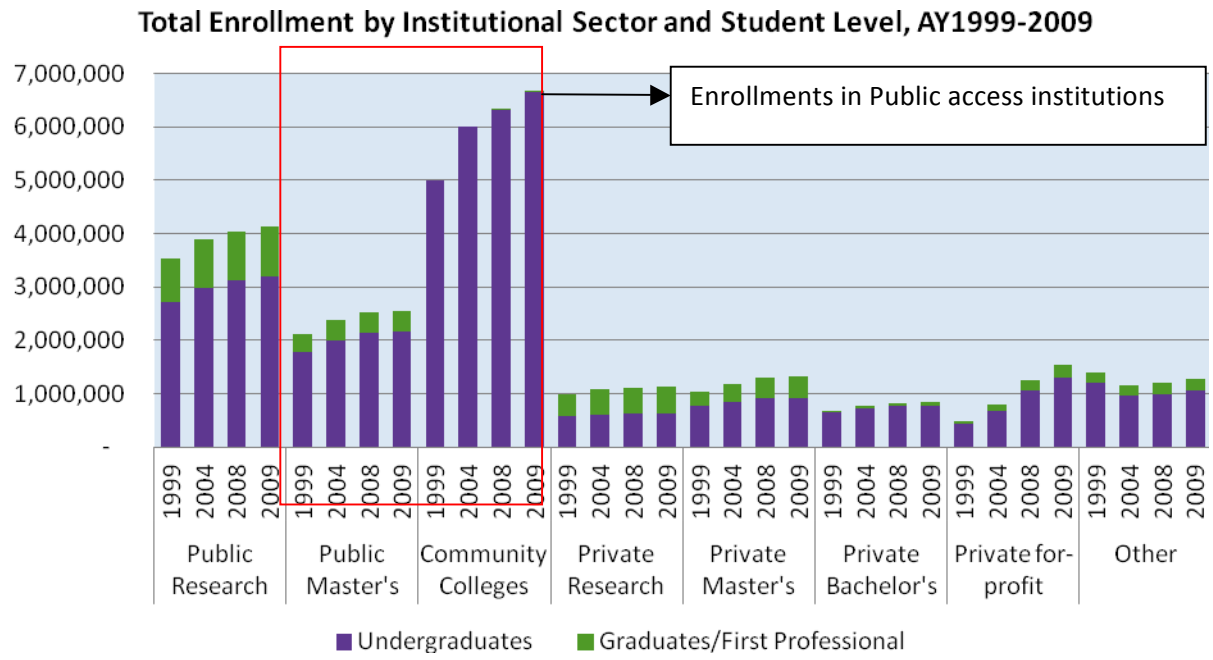
Characteristics of finance in public access institutions

The focus in this paper is on the finances of public access institutions – the public community colleges and masters' institutions that collectively enroll about half of all students in US postsecondary institutions, including the majority of low income and working adults. Although the non-selective public institutions serve a declining *share* of total student enrollments (as private for-profit institutional enrollments have climbed) in the last decade these institutions have increased enrollments by two million students - a faster rate of growth than in the entire 1979-1999 period.[1] Clearly, their success in maintaining access and in translating that to degrees or high value credentials is essential to the national agenda for increased attainment.



Note: "Other" includes public bccalaureate, private associate's, and all specialty, tribal, less than two-year, and unclassified institutions.

The paper will synthesize highlights from extant research to focus on the places most likely to be critical to current and future capacity for access and degree/credential completion. The nature of the topic requires this to be a scatter-shot presentation of snippets from several sources. Those already familiar

[1] Most of this growth occurred in the public community college sector; public masters' institution enrollments effectively have tapered off since 2004, possibly an indicator of institutions either turning away more students or student reaction to price increases.

with the research can fast-forward to the summary and conclusion, where recurring themes are highlighted, and recommendations presented for near-term action and additional policy research.

A brief tour of cost analysis – and the imperfections therein– in higher education

Analyses of institutional finances in higher education have historically been dominated by a focus on overall revenues and information from audits, and not how resources connect to performance or to decision making. The world of K-12 finance, by contrast, is much more developed.

Some of the aversion to measuring spending stems from a general resistance to public transparency among the most politically powerful colleges and universities. But it also emanates from legitimate and long-standing concern about the limits of cost analysis, and the inability to untangle inputs from outputs, along with weak measures of quality. There are additionally methodological and analytical problems involved in separating the production costs of instruction from research, graduate education from undergraduate education, and in separating the joint products of teaching, research and public service. (Bowen, 1980; Breneman, 2002; Jenny, 1996; Winston, 1998).

Much of the theoretical work on higher education spending has been on debates between those who argue that spending is a function of the 'cost disease' or whether it is all attributable to the never-ending search for revenues. (Baomol and Bowen, 1969; Bowen, 1980; Archibald and Feldman, 2010.) The 'cost disease' theory holds that costs inevitably rise in the service sector because of the high costs of professional labor and because productivity cannot be increased without sacrificing quality or service levels. Bowen (1980), Clotfelder (1996), Winston (2000) and Zemsky, Wegner and Massy (2005) additionally argue that competition is a cost 'driver' as institutions seek to advantage market position by spending resources to attract high quality faculty and students.

The revenue theory (Bowen 1980) holds that there is no such thing as a 'correct' spending level in higher education, because of the lack of measures of quality of outputs. As a result spending levels are determined not by need but by the availability of revenues. In his often quoted view, institutions will raise all the money they can, and spend all the money they can get. Bowen developed his revenue theory of costs after many years of work on finances of public research universities in search of empirical evidence of 'correct' spending levels. He was unable to find any relationship between spending and performance. He did however find consistent instructional spending *patterns*, with less spent on entry level students and more on upper division and graduate students. His findings were distilled into

recommendations to institutions on ways to budget for costs by weighting them by level of instruction. Those weights, reproduced below, subsequently became the source of many 'mode and level' funding formulae that dominated public sector allocations for many years.

- Lower-division students (freshmen and sophomores) = 1.0
- Upper-division students (juniors, seniors) = 1.5
- Professional students requiring at least two years of work = 2.5
- First year graduate students = 2.1
- Graduate students beyond the first year = 3.0
- Non-credit education = N.A.

Recognizing that the issues of outcomes, joint products, and undergraduate/ graduate costs are real ones, many of the revenue and spending complexities that have defeated work on higher education spending less of an issue for public access institutions than they are for the research sector or regional private non-profit institutions. Faculty in public access institutions don't get reduced teaching loads to do research. The institutions don't award doctoral degrees. They draw students from local or regional markets, and aren't spending (much) money to increase their student selectivity or to land faculty with the promise that they won't have to teach. (Kelly and Ewell, 2006) The majority of their programs are either sub-baccalaureate or baccalaureate, and their biggest graduate programs are in teacher education, historically a low cost program. They don't run big auxiliaries, or hospitals, or clinics. They don't have big capital campaigns, much as they might aspire to. But most of the research focuses either on private institutions or on public research universities, and relatively little on public access institutions.

Public and policy perceptions of costs. The revenue theory of costs (expressed somewhat differently) also frames the views of most public policy leaders, including former Secretary of Education Bennett (who argued that federal aid encourages tuition increases), and Charles Miller, chair of Secretary Spellings' Commission on the Future of Higher Education, who described higher education finance as a "dysfunctional, top-line" enterprise:

> Of particular serious concern to me is the dysfunctional nature of higher education finance. In addition to the lack of transparency regarding pricing, which severely limits the price signals found in a market-based system, there is a lack of the incentives necessary to affect institutional behavior so as to reward innovation and improvement in productivity. Financial systems of higher education instead focus on and reward increasing revenues---a top line structure with no real bottom line. (Miller, 2007).

Recent focus work and polling information shows that the majority of the public believe that rising college tuitions are caused by institutions promoting their own "bottom lines" over the needs of students or families. The critique about spending in higher education has grown in recent years, with the majority of the public believing that higher education is no longer affordable. (Public Agenda, 2010 and 2011.) A 2011 survey by the Pew Trusts found that 40% of the public questions whether higher education costs are worth their value. (Pew Trusts, 2011) The opinion research also shows that most of the public does not distinguish between public and private institutions, or between types of institutions. The institutional distinctions that are so important within the academy are either invisible, or just irrelevant, to the public. The negative view about higher education costs is particularly sharp among policy leaders, such as state legislators and budget officers. (Ikenberry and Hartle, 2000) Their views are that institutions have no interest in controlling spending, that rising tuitions could be mitigated by better management of spending, and that higher education overall has plenty of money but just needs to spend it better. (Immewahr, 2010).

Public opinion is relevant to the discussion of public access finances because many of the perceptions about spending are really not true as it affects public access institutions. But the perception of generous levels of funding generalizes across all types of institutions. And public access institutions have not historically distinguished themselves by using data to make the case for cost-effectiveness, although complaints about underfunding are common.

About the methodology for cost analysis

Empirical work on higher education spending typically uses some variation of activity based cost analysis, whereby spending is assigned to different areas of activity and normalized based on workload. The standard technique assigns revenues to different categories (instruction, sponsored research, student services, academic support, institutional support, operations and maintenance), and then averages them per FTE student. Inflation is adjusted using either the CPI-U or one of the two boutique indices developed specifically to reflect higher education spending patterns, the HEPI (higher education price index) or the HECA (higher education cost adjustor). The use of the special inflationary index for higher education has been criticized as evidence of higher education's self-referential habits for justifying spending. (Gillen and Robe, 2011) Comparisons of costs across different types of institutions typically rely on information reported to the federal government via the IPEDS surveys, which do not distinguish between instructional costs by level of instruction or discipline. IPEDS data also use different measures over time, because of changes in accounting standards behind financial data over time. This makes longitudinal analyses of revenue and spending patterns, and comparisons between public and private institutions, problematic.

Despite broad agreement about aggregate measures, there has never been complete consensus about the best way to assign spending to different functions within institutions. This is a particular issue in institutions that do graduate education and research, because of the difficulty of separating costs and products between undergraduate and graduate education, and between instruction and research. The institutional financial culture among research universities is additionally flavored by the baroque accounting requirements for federal indirect cost recovery. This issue is commented on by Hans Jenny (1996) in his manual for the National Association of College and University Business Officers (NACUBO) on cost accounting. Efforts by NACUBO in the early 2000s to promote a voluntary methodology for public reporting of costs for undergraduate education were adopted by only a handful of institutions, reportedly because of the data gathering involved, and the fact that the institutions didn't use cost data to make any decisions. (Association of Governing Boards, 2006).

An additional issue in cost analysis stems from the separation of operating and capital budgets. Most analyses of costs focus exclusively on operating costs, thus understating total spending by between 20% and 40% (Winston, 1995). The studies that do look at capital costs also show that capital spending increased most dramatically in the 1990's and 2000s among private institutions, and for athletic and related spending. Capital cost increases were much lower in the public sector, and were lowest among community colleges. (McPherson , Schapiro and Winston, 1993; Winston, 1995.)

Revenue and Spending Patterns across Public/Non-Profit Higher Education[2]

Dependence on state or local revenues. Revenues to public access institutions come mostly from state and local appropriations or tuition revenues. There is considerable variation between states in policies for funding public access institutions, with some states providing higher subsidy levels, versus those that expect students to pay a higher share. Absolute funding levels vary considerably as well; a graphic display of funding levels and subsidy structures by state for public access institutions, and for public research institutions, is provided in Appendix I.

Across all states, the share of state funding has declined over time, and the tuition share has increased, with the greatest increases in tuition shares in the public research universities. Among public research institutions and masters' colleges, the tuition share of spending in 2009 was approaching 50% of spending across the country, while it remained closer to 30% of spending in community colleges. (Delta Trends, 2011)

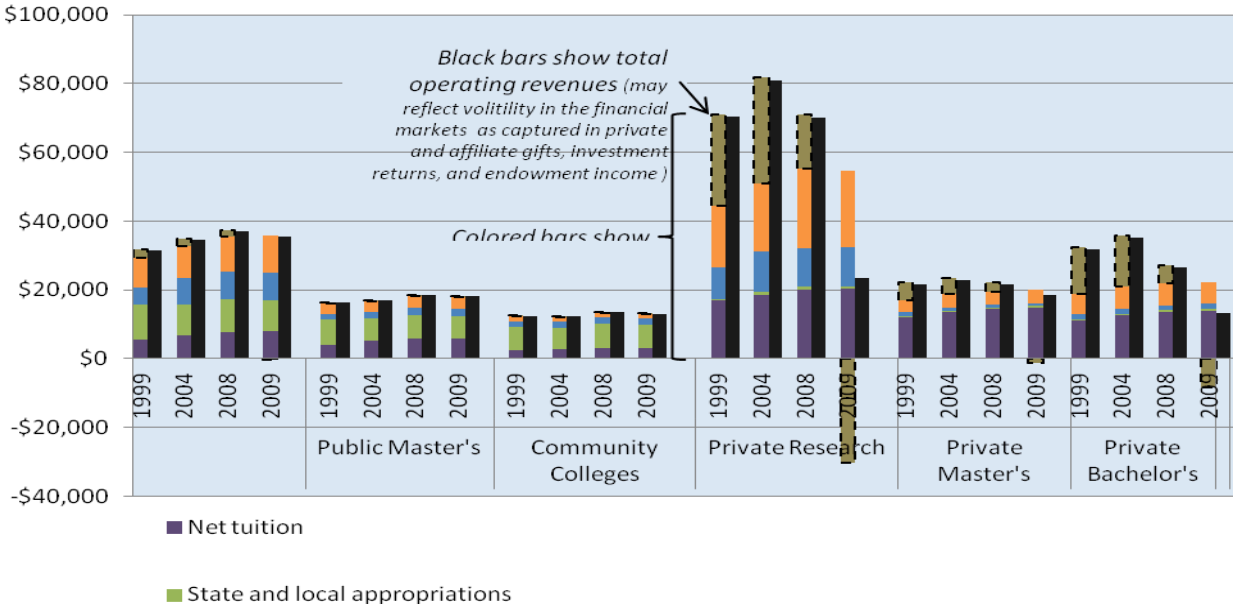
Subsidy structures versus spending. Analysis of the relationship between general operating subsidy spending levels – and subsidy structures - shows that variations across states in subsidy structures and spending levels are much greater than variations across institutions in expenditure *patterns*. Some institutions have more money than others, and some get more money from tuition and others from state and local appropriations. However, institutions with similar missions spend roughly equivalent percentages of funds on similar functions. As but one example: California Community Colleges, with tuition levels of $1025/student/year, against state appropriations around $7300/student year, have instructional spending levels around 50% of spending. New York, with community college tuition levels at $4100/year against state appropriations of $6600/year, have instructional spending levels around 48% of spending. Similar patterns show up in other spending areas. There are some exceptions of course – the Virginia Community Colleges spend much less on student services than their counterparts nationally. Whether this is a function of their funding formula, or an artifact of reporting, or a real funding

[2] Data for most of the information about revenues and spending are drawn from the Delta Project's analysis of IPEDS data for a panel of institutions, show the basic patterns of finance for public and nonprofit private institutions, organized by Carnegie category, using national medians for institutions in that category. Recognizing that there are a handful of public masters' institutions that are somewhat selective in their admissions pools, the Carnegie Classifications of 'public masters' and 'public community colleges' will be treated as proxies for public access institutions.

disadvantage for them isn't obvious from the data. Nonetheless, the general rule is that differences in revenue levels don't translate to differences in spending patterns.

Revenues from private resources are negligible among public access institutions, as are funds from federal contracts and grants. Revenues from auxiliaries are much more modest than in the public research sector, and are isolated primarily to food services, recreation centers, bookstores and student health services. Most public masters' institutions do not maintain residences for the majority of their students, and there are virtually no residence halls for community colleges. There are no teaching hospitals or affiliated laboratories. And revenues from auxiliaries, even when they exist, are typically prohibited by state law from being used to subsidize general operations.

Total Revenues per FTE Student, AY1999-2009 (in 2009 dollars[3])



[3] *Note: Slight differences in bar heights are a result of computational methods; larger differences shown in 2009 generally reflect negative returns from the private and affiliated gifts, investment returns, and endowment income (PIE) category of revenue. Source: Delta Cost Project IPEDS Database, 1987-2009, 11-year matched set.*

Community colleges also receive revenues for vocational and certificate programs through employer contracts supported with federal workforce development funds. IPEDS expenditure data do not show what revenue sources pay for specific functions, although the data include all sources of revenue paying for the instructional function. So the spending levels are correct, even if it is hard to know how much of the instructional activity is effectively subsidized with employer funding. Similarly, the amount of tuition revenue that is supported either directly or indirectly with student aid, whether grants or loans, isn't readily discernible from revenue and spending data.

Pricing versus Revenues, AY1999-2009 (in 2009 dollars)[4]

		1999	2004	2008	2009	2008-2009 change	
						Dollars	Percent
Public Research	**Sticker Price**	$4,440	$5,733	$6,609	$6,926	$317	4.8%
	Gross Tuition	$6,351	$8,055	$9,405	$9,881	$476	5.1%
	Net Tuition	$5,353	$6,640	$7,661	$8,030	$369	4.8%
	Tuition Discount	16%	17%	18%	18%	0%	
Public Master's	**Sticker Price**	$3,719	$4,705	$5,404	$5,666	$262	4.8%
	Gross Tuition	$4,522	$5,661	$6,458	$6,748	$290	4.5%
	Net Tuition	$4,075	$5,053	$5,698	$5,923	$225	4.0%
	Tuition Discount	10%	11%	12%	12%	0%	
Community Colleges	**Sticker Price**	$1,842	$2,179	$2,362	$2,429	$67	2.8%
	Gross Tuition	$2,474	$2,970	$3,266	$3,385	$118	3.6%
	Net Tuition	$2,307	$2,757	$3,005	$3,118	$113	3.8%
	Tuition Discount	11%	10%	11%	11%	0%	
Private Research	**Sticker Price**	$22,713	$25,960	$28,851	$30,093	$1,242	4.3%
	Gross Tuition	$22,375	$25,406	$28,015	$29,007	$992	3.5%
	Net Tuition	$16,825	$18,578	$20,071	$20,363	$293	1.5%
	Tuition Discount	24%	26%	27%	29%	2%	
Private Master's	**Sticker Price**	$16,239	$19,042	$21,252	$22,207	$955	4.5%
	Gross Tuition	$15,373	$17,779	$19,433	$20,309	$876	4.5%
	Net Tuition	$11,895	$13,415	$14,328	$14,864	$536	3.7%
	Tuition Discount	23%	24%	26%	26%	0%	
Private Bachelor's	**Sticker Price**	$16,860	$19,510	$21,464	$22,437	$973	4.5%
	Gross Tuition	$16,285	$18,992	$20,965	$21,833	$868	4.1%
	Net Tuition	$10,983	$12,575	$13,589	$13,969	$381	2.8%
	Tuition Discount	35%	33%	34%	35%	1%	

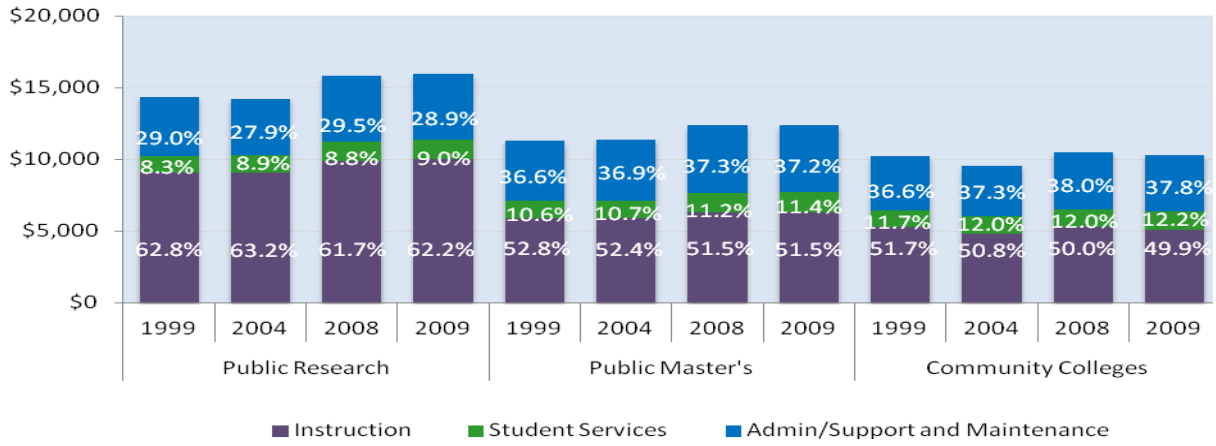
[4] Delta Cost Project, 11-year matched set.

Sticker prices lower than net tuition revenues. In all types of public institutions, sticker prices -- posted in-state tuitions for undergraduate students -- are lower than either gross or average net tuition revenue per student. This is quite different from tuition discounting patterns in the private nonprofit sector, where net tuition revenue is less than sticker prices. It means that public institutions are maximizing tuition by increasing enrollments from out-of-state and international students to get more 'full-pay' students, and through fees and other charges that are not labeled 'tuition.' Tuition discounts - measured as the gap between gross and net tuition revenues - are around 11-12%, compared to 18% in the public research sector, and around 30% among private institutions. This suggests that competition for students is a factor in driving costs, but nowhere near what it is in other types of institutions. (Delta Trends, 2011)

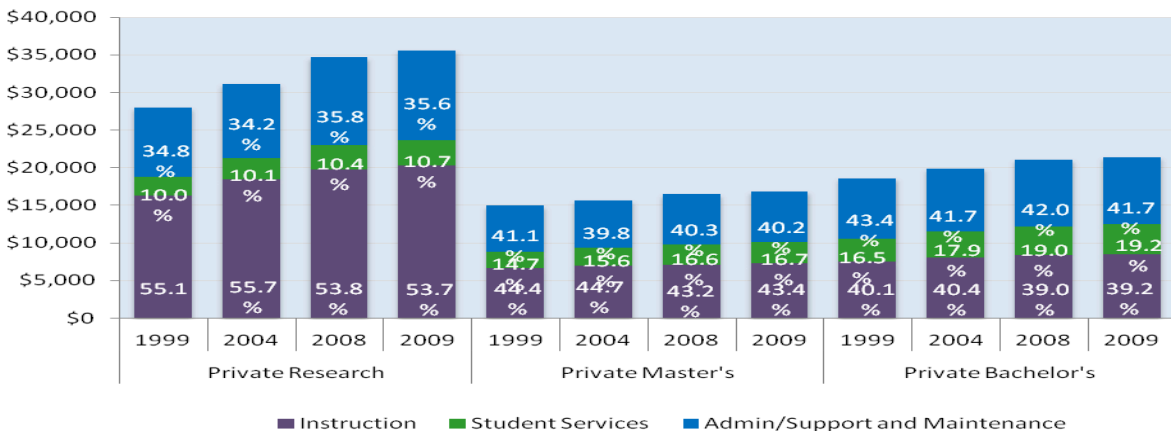
Instructional spending accounts for around half of E&R spending in public access institutions -- well below levels in public research universities. Spending for the direct cost of instruction (e.g., excluding overhead, student support, and related academic and institutional support and maintenance) among public access institutions is about 50% of educational and related spending, considerably less than for public research universities, and larger in percentage terms --but not spending levels -- than in private institutions. Three things explain the disparity in the research sector: higher faculty salaries, lower class sizes, and lower teaching loads. The graph below shows patterns for public against private non-profit institutions. In this presentation of data, the "Administrative/Support and Maintenance" category includes spending for all types of overhead, excluding only spending for student services and instruction. (Delta Trends 2011)

Incremental budgeting, dominated by state appropriations process. Public access institutional funding levels are strongly influenced by state budgeting and allocation practices, which remain primarily incremental despite periodic efforts to shift funding to outcomes or performance. Allocations are based on historic funding levels with potential adjustments for inflation, 'mandatory' cost increases such as for employee benefits and inflation, and for changes in enrollments. Typically, funding for 'base' requirements take precedence over funding for enrollments or incentives for outcomes if these adjustments are in place, or other types of new initiatives. In the current funding environment, many states are not paying for enrollment increases, or even inflationary adjustments, which mean that funding for mandatory increases in health benefits, are now consuming most of the 'new' money going from states to institutions.

Average education and related spending per FTE student by component, AY1999-2009 (in 2009 dollars) - Public institutions



Average education and related spending per FTE student by component, AY1999-2009 (in 2009 dollars) - Private non-profit institutions



Cost -based funding history disadvantages public access institutions. Although enrollment-based funding is on the wane, the structure of public institutional funding reflects historic approaches to cost-based funding through different variations of formula-based funding. These formulae are based on efforts to rationalize funding through measures of resource 'need' as these are measured through benchmarks of

spending from comparison institutions. Examples of 'mode-and-level' formulae currently in use in two large public systems -- Texas public institutions, and the Minnesota State Colleges and Universities (MnScu) –are appended to this report.

While some of the mode-and-level approaches are based on audited data (Ohio is an example), most allocation models began as some variation of cost weights promoted by Howard Bowen in his 1980 work on costs. An analysis by Conger and colleagues at the State Higher Education Executive Officers (SHEEO) organization shows the consequences of these allocation formulae on spending structures. Using data for state systems in Florida, Illinois, Ohio and New York (the only systems that maintain historic expenditure data at this level of detail), they found average instructional cost patterns as follows (Conger et al, 2010):

		Cost of Instruction (CI) in Millions (M)							
		Florida (2007)		Ohio (2007)		Illinois (2007)		New York-SUNY (2004)	
Course Level		CI (M)	Percent of Total	CI (M)	Percent of Total	CI (M)	Percent of Total	CI (M)	Percent of Total
Undergraduate		**$ 1,486**	**68%**	**$ 2,461**	**67%**	**$ 1,097**	**66%**	**$ 416**	**65%**
	LOWER	$ 517	24%	$ 875	24%	$ 357	22%	$ 175	28%
	UPPER	$ 969	45%	$ 1,585	43%	$ 740	45%	$ 240	38%
Graduate		**$ 692**	**32%**	**$ 1,206**	**33%**	**$ 555**	**34%**	**$ 222**	**35%**
	GRAD I	$ 506	23%	$ 861	23%	$ 377	23%	$ 133	21%
	GRAD II	$ 186	9%	$ 345	9%	$ 178	11%	$ 89	14%
TOTAL		**$ 2,178**	**100%**	**$ 3,667**	**100%**	**$ 1,652**	**100%**	**$ 637**	**100%**

The data for Florida and SUNY include only public four year institutions, both masters' and research institutions, whereas the Ohio and Illinois examples include public community colleges in those states. The SHEEO study found the basic spending levels for lower division costs within states for four year and community colleges to be virtually the same. When the SHEEO analysts reduced these spending levels to weights by level of instruction, with the average cost of lower division instruction set at 1.0, they found cost structures very close to Bowen's:

Lower Division weighted average cost per credit hour: 1.0
Upper Division weighted average cost per credit hour: 1.42
Graduate 1 weighted average cost per credit hour: 2.88
Graduate 2 weighted average cost per credit hour: 4.0

The SHEEO study additionally looked at the patterns in the percentage of credits by level, versus spending by level:

SCH by level of instruction, contrasted to instructional spending by level of instruction		
	% of all credits taken	% of total spending on instruction
Lower Division	36%	23%
Upper Division	48%	44%
Grad 1	12%	23%
Grad 2	4%	9%
	100%	100%
Source: Conger et. al., 2010		

These figures show that - in public four-year institutions - the financial 'cross-subsidy' from lower division to graduate education shifts about 13% of instructional resources from lower division to graduate education. The upper division shift to graduate education is around 4% of spending. Since community colleges only have lower division classes, the cross-subsidies that may also be occurring in these institutions are not evident from this data.

Discipline determines spending levels. Studies of instructional costs find that discipline mix explains more about differences between institutions than any other factor including mission. In addition to the SHEEO study cited earlier, there are two national consortia that generate private benchmarks of instructional spending through sharing of data on instructional costs: the Delaware and Kansas studies of instructional productivity (so named because they are located in institutional research offices in institutions in those states). The Kansas study is particularly pertinent, as it focuses exclusively on public community colleges. A sample report for an unnamed institution from the Kansas project is below. (Conger et al, 2010; Kansas, 2011; Middaugh, 2004)

Both the Kansas study and the MnScu cost weights alluded to earlier reinforce a finding that, among community colleges, spending for vocational/technical programs on average is higher - sometimes significantly so - than spending for academic programs. This means that, for community colleges, the 'cross-subsidy' pattern is likely between academic and vocational programs, rather than across levels of instruction, with academic programs generating revenue for vocational programs.

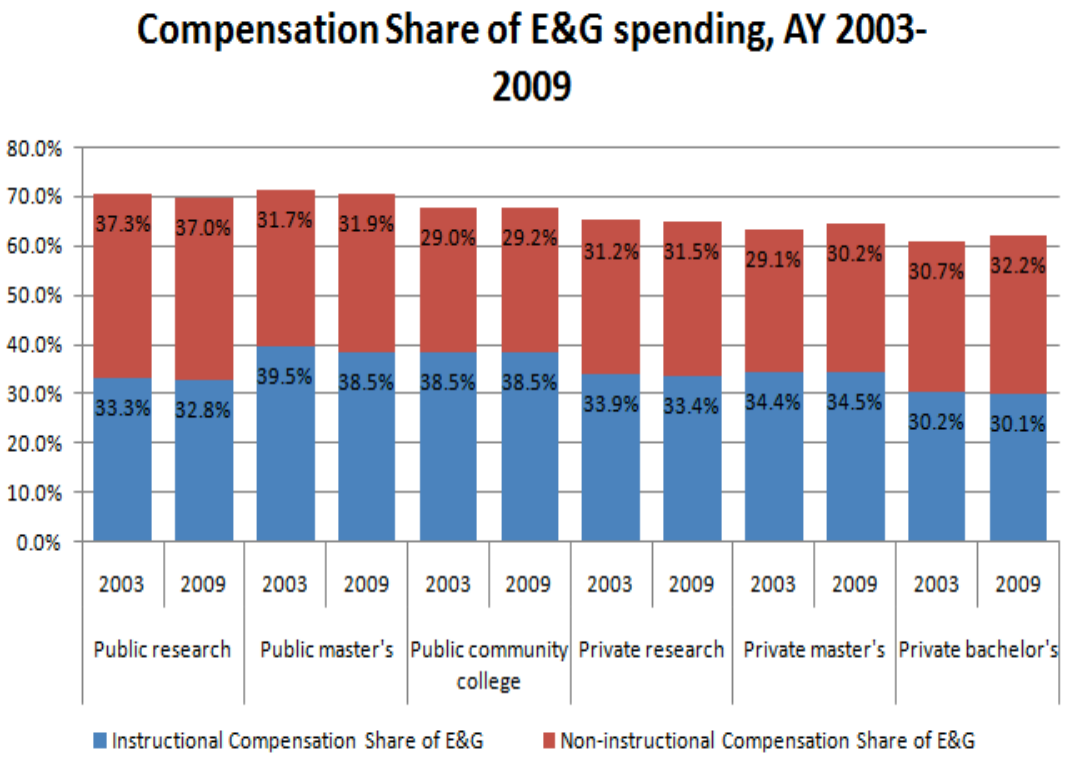
Discipline	Local (provided in reports to participating institutions)	National Standardized Mean
Accounting	$104	$77
Administrative and Secretarial Services	235	110
Automotive Technology	230	162
Biological Science/Life Sciences	100	69
Business Admin/Management	137	80
Child Growth, Care and Developmental Studies	79	65
Computer & Information Sciences, General	170	77
Criminal Justice & Corrections	68	63
Dental Assisting/Assistant	398	266
Engineering-Related Technologies	114	145
English Language & literature/arts	129	116
Fine Arts & Art Studies	155	74
Foreign Languages & Literature	70	72
Hospitality Management/Culinary Arts	129	116
Mathematics	78	66
Nursing	487*	223
Psychology	50	45
*Outlier, outside +2 or more standard deviations.		

Kansas Study of Instructional Costs, Sample reporting of Average Instructional Costs per SCH by Academic Discipline.

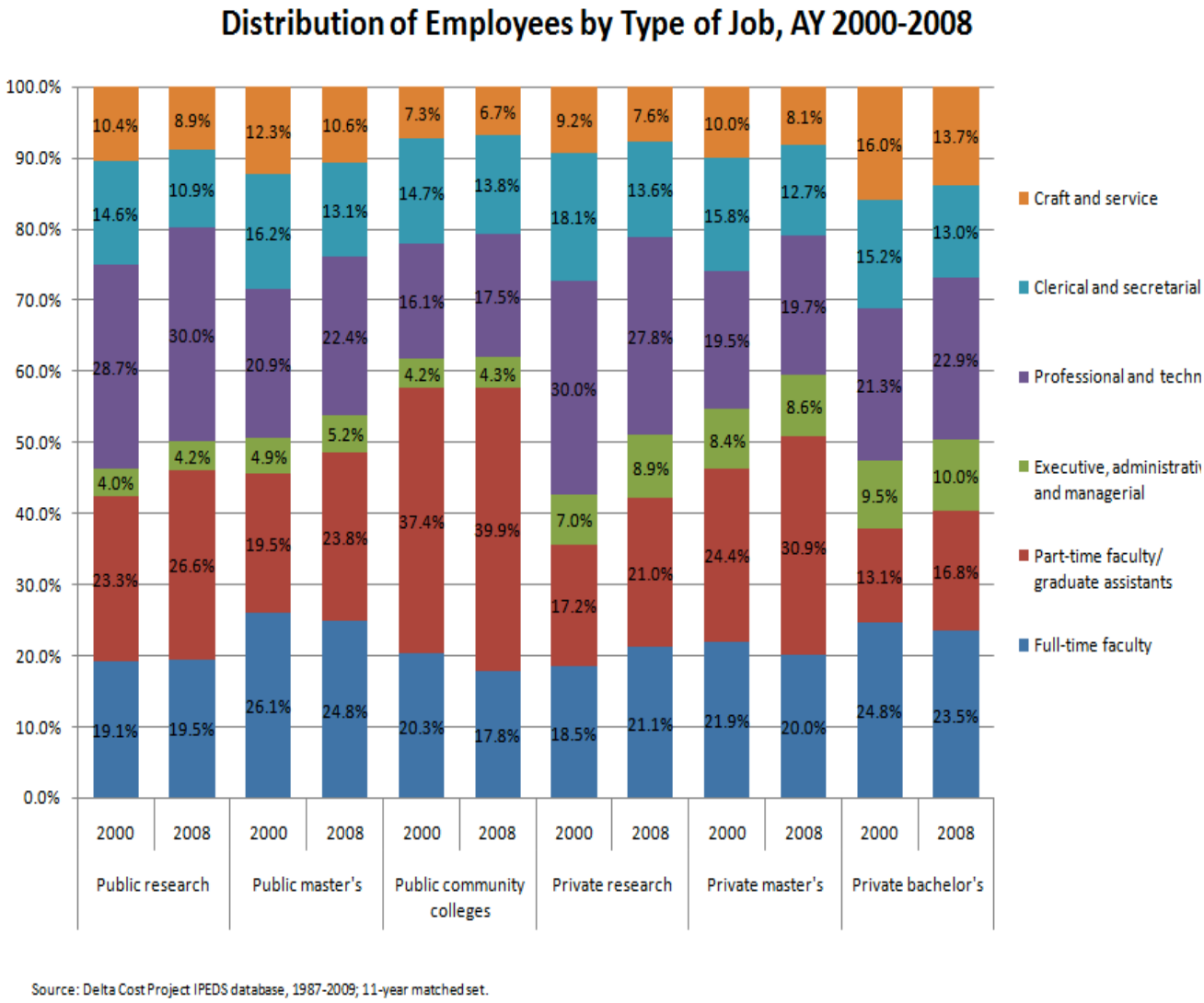
Administrative and maintenance costs higher in public access institutions. Spending for institutional support - the administrative category that excludes spending for academic support and student services – and for operations and maintenance are *proportionately* higher in public access institutions than in public research universities. These spending figures are probably explained by the relatively smaller size of these campuses compared to research universities, and the fact that most community colleges are still locally controlled and not part of governing systems. They don't benefit from (some might say don't have to suffer with) centralized systems for admissions, personnel, data processing, procurement, legal support, and instituitional research. When one considers that the institutional support and maintenance in research universities are also supporting the administrative costs of research and service, these spending levels among access institutions seem particularly high. (Delta Trends, 2011)

Compensation favors benefits over salaries in access institutions. The share of spending going to pay for employee compensation among public access institutions is roughly comparable to that of other sectors--around 70% or lower in all types of institutions. However, the composition of spending is different, with public access institutions spending slightly higher shares on average for instructional compensation as contrasted to other types of employees. (Delta Trends, 2011)

Spending on Institutional Support and Maintenance as a Percentage of E&G Expenditures (excludes auxiliary enterprises) - FY 2009		
Sector	Institutional Support only	Institutional support + Operations and Maintenance
Public Research	9%	17%
Public Masters	14%	25%
Public Community Colleges	16%	26%
Private Research	14%	22%
Private Masters	22%	31%
Private BA	23%	33%



Full-time faculty proportionately highest among public masters institutions, but lowest among community colleges. Full-time faculty are the largest category of employees in the public masters' sector, in contrast to the community colleges and private masters' institutions where part-time faculty dominate. The proportion of faculty who are full-time is highest among the public masters' institutions and private baccalaureate institutions, at around 25% of all employees. In both public and private research institutions, people with professional and technical titles are the largest category of employees. These titles can include student service professionals, analysts, auditors, attorneys, and researchers. (Delta Trends, 2011)



Source: Delta Cost Project IPEDS database, 1987-2009; 11-year matched set.

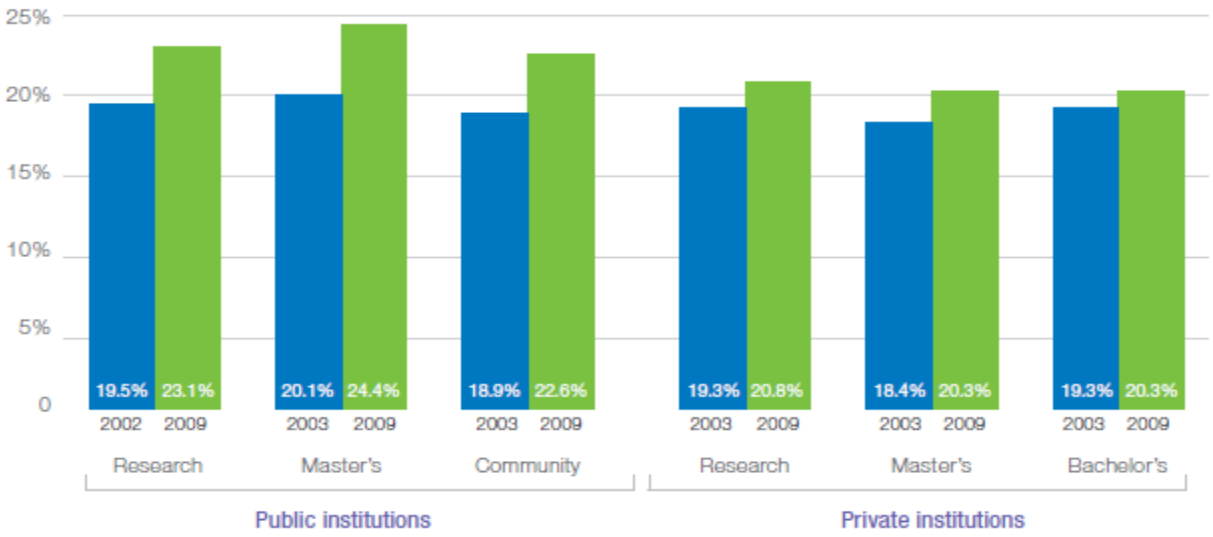
Spending increasest for employee benefits. Employee benefits are the single largest area of increased spending between 2002 and 2008 among all types of public institutions, averaging 5% per year against flat spending for salaries. The benefit share of compensation per employee is now around 23% for public access institutions - just slightly behind comparable levels in public research institutions. If state funds continue to remain flat, spending increases at this level into the future will require 5% per year in increased tuition and fees just to pay for benefits. (Delta Trends, 2011; scenarios for tuition/benefits from NCHEMS/Delta, 2010.)

Changes in spending on employee compensation 2002 to 2008

Average annual percent change

	2002-2008			
Public institutions	**Salary outlay per employee**	**Benefit cost per full-time employee**	**Compensation per employee**	**Compensation per FTE student**
Research	0.9%	5.2%	1.7%	1.6%
Master's	-0.6%	4.6%	0.4%	0.6%
Community colleges	0.7%	5.2%	1.5%	1.1%
Private institutions				
Research	-0.3%	1.6%	0.0%	1.7%
Master's	-0.8%	2.4%	-0.5%	0.6%
Bachelor's	-0.5%	1.3%	-0.2%	0.7%

Benefit share of total compensation costs, AY 2002-2009



Cost per degree highest in community colleges. Although costs per *student* are generally lowest among public community colleges, costs per *degree* produced may not be similarly low, because of the relatively high rate of student attrition in community colleges. That means that community colleges may not be cost-effective educational investments if the goal is spending against degree performance. (Delta Trends, 2011)

Getting estimates of measures of spending against degree and certificate production is somewhat difficult with existing national data. Aggregate measures of all spending per student against all types of degrees and certificates can be obtained; these show that education and related costs are lowest among the public masters' institutions, which in turn are quite close to comparable measures among nonprofit private masters institutions. Aggregate spending per degree produced is higher among public community colleges than in the public research sector, because of the relatively low rates of degree production in community colleges. If all types of awards are 'counted' as degrees, including certificates and other diplomas, spending per 'completion' in community colleges is lowered considerably, to levels closer to those of the public masters' institutions.

Average Education and Related Spending per Degree and Completion, AY1999-2009 (in 2009 dollars) (From Delta Trends in College Costs, 2011)

	Public Research		Public Masters		Public Community Colleges	
	Spending per Degree	Spending per Completion	Spending per Degree	Spending per Completion	Spending per Degree	Spending per Completion
1999	$61,532	$60,703	$52,446	$51,783	$86,528	$52,001
2004	$60,495	$59,525	$52,874	$51,896	$74,594	$47,880
2008	$64,873	$63,499	$55,889	$54,817	$74,714	$47,219
2009	$65,632	$64,179	$55,358	$54,167	$73,940	$46,759
	Private Research		Private Masters		Private Bachelors	
	Spending per Degree	Spending per Completion	Spending per Degree	Spending per Completion	Spending per Degree	Spending per Completion
1999	$93,502	$92,059	$53,507	$52,422	$90,995	$88,681
2004	$102,745	$100,684	$53,357	$52,071	$90,980	$88,900
2008	$113,532	$110,726	$55,377	$53,798	$96,750	$94,825
2009	$115,238	$112,311	$56,154	$54,359	$98,350	$96,674

Measuring cost of attrition. High student attrition among public access institutions clearly contributes to higher production costs (and costs per student) than would be the case if attrition were to be lowered. Metrics for estimating attrition costs are not well developed. Mark Schneider has conducted a few analyses to estimate attrition costs, using federal Beginning Postsecondary surveys to estimate student flow, and state/local appropriations and student aid for spending. His technique results in an estimated attrition rate of 40% among community colleges, at an annual cost of $3 billion - a figure that includes state and local appropriations of $3 billion, an additional $240 million in state spending on student aid, and $660 million in federal student aid. (Schneider, 2011)

The Schneider methodology for estimating 'lost' spending from student attrition is likely too high, as it is generated from average revenue figures and not measured against spending by credit hour. Since the majority of student attrition occurs in the first year, when instructional costs are lowest, a more granular estimate would produce a lower estimate. Suggestions about ways to do that can be found from two sources: Nate Johnson's recommended methodology for measuring degree production costs, and results of a study produced by the Ohio Board of Regents. (Johnson, 2008; Ohio Board of Regents, 2005)

Johnson estimated that attrition costs among public four year institutions in Florida were around 15% of instructional spending - against average rates of attrition of around 40%. The reason for the lower spending figure is that the majority of student attrition occurred in the first year of college, where unit costs are lowest. The Ohio Board of Regents study focused on measures of the cost of developmental education, not precisely a study of attrition, but on a related topic. They found that approximately 38% of students in public community colleges enrolled in developmental courses, which translated to just 5% of FTE students, and around 3.6% of instructional spending. Again, the smaller figure is produced because spending on developmental education is much lower than average spending across all levels of students. The Ohio study also concluded that the combination of state appropriations and student tuition revenue paid per student enrolled in developmental courses are considerably higher than what is spent on them -- making developmental education a net revenue winner for the institutions. Ohio is one of the states now promoting outcomes based funding for its institutions, so the incentives inherent in past spending patterns may be changing. (Ohio Board of Regents, 2005)

Degree productivity increasing among public access institutions-- because of a shift toward certificates/diplomas rather than degrees. Another measure of degree productivity can be developed by evaluating degree and certificate production against student enrollment, and looking at patterns over time. All sectors have been increasing degree productivity in the last few years, as proportionately more students are getting degrees or diplomas relative to enrollments. The greatest gain has been among public community colleges, because of growth in certificates rather than increased degree production. Average student credit hours per graduate have also declined by an average of 9 units per graduate in public institutions. (Delta Trends, 2011)

Bifurcation of fiscal and academic decision-making. Although some institutions use fiscal data better than others, it is probably accurate to say that most institutions of higher education do not use spending data to drive decisions about academic priorities or resource allocation. This reflects historic approaches to budgeting, but also stems from the typical bifurcation of decision authority within most institutions,

Credit hour per completion, AY 2002 - 2009

	Undergraduate			Graduate		
	2002	**2009**	**2002-2009 Change**	**2002**	**2009**	**2002-2009 Change**
Public research	**164**	**153**	**-10**	**77**	**70**	**-8**
Public master's	**169**	**160**	**-9**	**66**	**59**	**-7**
Public community colleges	**173**	**164**	**-9**	**---**	**---**	**---**
Private research	**141**	**140**	**-1**	**71**	**65**	**-6**
Private master's	**134**	**132**	**-2**	**62**	**58**	**-3**
Private bachelor's	**148**	**152**	**4**	**---**	**---**	**---**

separating academic authority from bureaucratic authority. Baldridge (1971) describes the authority structure within conventional colleges and universities as being characterized by parallel (and thus never intersecting) realms of authority separating academic and fiscal decision making. While the dominant role of faculty in decision-making is strongest in research universities, the tradition of bifurcation between academic and fiscal policy is strong in all types of public institutions. The segregation between policy and resource use is exacerbated in public access institutions, which are the most heavily regulated by state government. Public masters institutions are additionally often part of systems, where decisions about major fiscal drivers such as employee compensation are made by the system or the state rather than by the institution. This creates an environment in many public access institutions of a sense of lack of empowerment over the allocation of resources, where managers are inclined to think about costs as inevitable and fixed, rather than resources that can be managed.

Higher education also has a history of weak internal and external transparency about resource use. Basic facts about where money comes from or where money goes are the stuff of mystery. Several efforts to promote transparency and public accountability for higher education – such as the VSA (Voluntary System of Accountability adopted by many land grant and masters institutions), and the U-CAN (University and College Accountability Network, currently being promoted among private non-profit institutions) display information about student tuition and fees, but nothing about spending patterns. Surveys done by the Association of Governing Boards in conjunction with the National Association of College and University Business Officers found that although 95% of institutions reported publicly to their boards about finances, most of these discussions centered on a few decisions, such as tuition levels,

or faculty compensation. Fewer than 25% of all types of institutions discussed spending data with their boards (Association of Governing Boards, 2007) Surveys of perceptions of business officers, conducted in 2011 by Inside Higher Education, found high numbers of finance officers in public access institutions holding the view that their institutions could make better use of data about costs to eliminate underperforming academic programs and to make better use of facilities. The study also showed that public community college officers were most likely to believe that their current 'budget models' work reasonably well - a curious fact given their funding levels, and a contrast to perceptions of professionals from other sectors, the majority of whom believe the budget models are 'broken.' (Inside Higher Education, 2011)

Additional research on spending and effectiveness. The research on the relationship between spending and effectiveness is remarkably thin in higher education. (See Ewell and Wellman, 2007, and Wellman, 2008). There are some exceptions that are relevant to effectiveness among access institutions:

- Romano and Djajalaksana (2008) looked at spending and degree attainment patterns among community colleges in comparison to other public institutions. They were interested in whether states could expect to save on postsecondary costs by shifting enrollments into community colleges as against comprehensive or research institutions. They adjusted costs to confine comparisons to spending in the first two years, and to further compare spending against degree attainment or transfer. Their results show a slight cost advantage to the public comprehensive institution over the public community colleges.

- Webber and Ehrenberg (2009). Cornell Higher Education Research Institute researchers Webber and Ehrenberg looked at the influence of spending in different areas (instruction, student services, and other areas) on graduation and first-year persistence rates of undergraduate students. They found the strongest influence from student service expenditures, with the highest marginal effects for students in institutions with low admissions selectivity and high proportions of Pell grant students. Simulations of the effect of reallocation from instruction to student services showed an enhancement of persistence and graduation.

- Research on part-time faculty. There are a few studies on the correlation between high levels of part-time faculty and student learning, with slightly mixed results. Umbach (2006) surveyed faculty using data from the Faculty Survey of Student Engagement to evaluate the relationship between faculty appointment status and institutional engagement with effective teaching practices. He found

contingent status, particularly part-time status, to be negatively related to faculty job performance in undergraduate education: less use of active and collaborative teaching techniques; less likely to challenge the students academically; less likely to spend time preparing for class; and less likely to interact with students.

Ehrenberg and Zhang (2005) used institution-level panel data to look at first-to-second year persistence and graduation rates and use of part-time or non-tenured full-time instructors; they found that increases in non-tenure and part-time faculty reduce both rates.

Bettinger and Long (2003) also looked at how adjunct faculty affect student interest and course performance, using detailed data from Ohio public institutions. The Ohio study allowed matching of student unit-level data including transcripts with faculty teaching the courses, so the researchers could adjust for differences in academic preparation as well as course-taking patterns. This study found different effects depending on discipline, with an overall slight loss of student interest in the subjects for courses taken from graduate students and adjuncts compared to full-time faculty, and a slight positive effect from use of adjunct professors among disciplines with an occupational or vocational focus.

Summary of important conclusions from the research

A short summary of the major take-aways from the research follows, with emphasis on the implications of the research for future funding, access and degree completion.

1) Public access institutions do not have access to the same level nor diversity of revenues characteristic of public research universities and non-profit institutions. They are basically dependent on state/local appropriations and student tuitions. Employer support for vocational/technical programs is reported to be important, and potentially can be a greater source of funding in the future. This may take some pressure off of funding for academic programs, which now likely are being used as a revenue source to pay for the higher cost vocational programs. But there is no evidence that 'new' revenue sources can be found to pay for core programs in the areas most essential to future learning: developmental education, lower division education, education in English, math, writing, history, and social studies.

2) The endless debate about whether the 'cost disease' or the 'revenue theory' of costs is correct should be laid to rest, as least as it affects public access institutions. The overwhelming evidence supports the revenue theory, e.g., that costs area determined by revenues. Finding 'correct' funding levels for public access institutions will be an endless snark hunt. Time may be better spent looking at

surrogate measures of the effectiveness and efficiency of resource use, and to whether institutions are meeting public goals for access and degree/certificate completion.

3) There has been a tendency to conflate low costs per student with cost effectiveness. They are not the same. Community colleges are not 'cost-effective' in translating access to outcomes. And although public masters' institutions also have high rates of attrition, their lower spending levels and focus on the BA degree as the predominant outcome mean that they are more cost-effective at getting students to degrees than research institutions. A similar case can be made for cost-effectiveness for public masters' institutions. Improving cost effectiveness will require simultaneous attention to increasing student success, and to reducing costs in areas not contributing to student success.

4) The funding formulae and cost models in public access institutions were largely inherited from funding patterns in research universities. In addition to ensuring perpetually fewer resources for the instructional program, which probably correlates with the high rates of attrition in public access institutions, there are other elements built into these funding formulae that may be wholly inappropriate for these institutions:

    a. A presumption that lower division courses can be offered through large lecture classes supplemented with teaching assistants. Even without getting into the question of teaching effectiveness, this model "works" in the public research universities because they serve high proportions of academically well prepared students in institutions that remain largely residential. The combination of high levels of student preparation, and the supplemental academic support that comes from the 'co-curriculum' in a residential environment, help to promote student success. Neither holds in public access institutions: students are not well prepared for academic success, and very few live on campus.

    b. The formulae only generate resources for credit-bearing instructional activities. Instruction that is not credit bearing (such as developmental education, or adult education) is ignored, as are academic support and student services. This means there are almost no incentives for institutions to allocate resources to developmental education, even if additional funding might improve results. Student services and academic support come 'out of the hide' of the instructional program. The FTE basis for measuring credits further disadvantages the public access institutions that serve high proportions of students taking less than a full credit load. Workload formulae for student support services in particular should be based on headcount

enrollments, possibly adjusted further for the proportion of students who are eligible for Pell grants.

c. The credit-system as it has been implemented in most public colleges, coupled with the mode-and-level funding formulae, reinforces discipline-defined, and time- and traditional class-based delivery of instruction. The interdisciplinary, short-course, intensive tutorials that might work better for at risk students are harder to put together in public access institutions. The regulatory system behind credit hours, and the mode and level funding formulae, are hard although not impossible to get around. Creative administrators know how to work the system to get the models they want, but too many can fall victim to clumsy and outmoded regulatory models. Private non-profit colleges don't have similar constraints, since many of them measure progress in course credits, rather than credit hours. They translate the course credits to credit hours in transcripts, but they are not used for workload or funding. There's nothing to limit more of this in public institutions, except for the funding formula and the inertia of big systems.

5) Public access institutions are primarily focused on instruction – teaching and learning. The focus on instruction as the central mission shows up in spending patterns, where a higher proportion of spending is on instructional salaries, and where public comprehensive colleges still maintain the highest proportion of faculty who are full-time. Even so, the public access institutions spend way too much of their very limited money in areas that are only tangentially contributing to instructional success – institutional support, for the accountants, lawyers, and other managers – and for operation and maintenance of the physical plant. They have shown that they know how to cut budgets, but the evidence is that they do this by using increasing numbers of part-time faculty, who at least likely to be able to engage in the high impact educational practices most likely to lead to deep learning and to student success.

6) The budget models drive behaviors in ways that perpetuate the status quo, and make it harder for local administrators to be strategic in their approaches to funding. Funding models are heavily incremental, and make it hard to program managers to do the kind of strategic thinking necessary to shift resources away from low-performing areas into places that pay off in academic success. The psychology of the institutions is often one of a lack of empowerment: their students are hard to teach, they don't have enough money, they don't control the money they have, and their budgets are being cut. Even so, these institutions have come to be comfortable places for people to have safe careers – and this increasingly means the support, administrative and maintenance staff, not the large numbers

of adjunct and part-time faculty who do not qualify for benefits and have little or no employment security. Reducing costs in the growth of employee benefits – beginning with the huge liabilities in retiree health care – would be a good starting place for cost-cutting attention. But most of these institutions either don't control those costs, or don't believe they can control them.

Conclusions and recommendations

The fiscal pressures facing public access institutions are intense, and likely to remain so for the foreseeable future. The days when state funding could be counted on to increase every year are long since over, and institutional cost-shifting to backfill for funding cuts with tuition increases may have reached its limit. Yet public demand for higher education remains at an all time high, with considerably more pressure on enrollments in public access institutions than most institutions have the resources to accommodate under current cost and delivery structures. The collision between student demand and revenues *will* lead these institutions to reduce access and quality unless they are able to reshape their cost structures. This has clearly already started to happen: California reported one-year enrollment losses in 2010 of 165,000 students – the majority in the community colleges and the Cal State system. CSU, the institution doing the most in that to serve community college transfer students, has reduced transfer enrollments by 30% -- some 20,000 students – just since 2007. (Keller, 2011)

Clearly the case can and should be made for special attention to funding adequacy among public access institutions – the institutions with the lowest levels of resources, enrolling the majority of students with educational and other needs. But in this environment, it is unrealistic to expect new revenues to solve the public access funding problem. Advocacy for new revenues is legitimate, but it has to be accompanied by much more attention to efficiency and effectiveness, to streamlining the academic program where possible, reducing administrative expenses, and focusing spending on areas most likely to pay off in student success. And while reduced costs alone will not yield enough in savings to pay for all that is needed in future attainment, it will be a major down-payment on the bill that's coming due. Moreover, cost management requires greater strategic attention to the integration of good academic policy with good fiscal practice. This will necessitate greater attention to information about how resources are used, in particular data that connects resource use to performance in ways that are actionable within the decision environment of public access institutions.

Recommendations

The focus for improvements in funding of public access institutions should be toward ensuring capacity to meet public needs for access and performance. While the institution may be the unit of analysis, the

measure of performance should not be exclusively institutional fiscal viability, but how resources are used in to advance public needs for higher education. In this time of declining public subsidies and growing 'privatization,' the lever on the public agenda has never been more fragile. Fiscal policy has always been the most potent policy tool for changing public policy, and for changing institutional performance.

Immediately actionable

Assuming the 'evidence' from this research is accurate and compelling, there are a number of suggestions about areas that are immediately actionable toward meeting the goal of focusing more resources on student access and success:

1) Consolidation in administration and operations. State, regional, and district-level initiatives should be begun, with the goal to consolidate and streamline the delivery of administration and operations support for multiple institutions in a region. Attention should go to partnerships spanning public access and comprehensive institutions, looking at ways to also improve the flow of students across institutions such as through common admissions and placement information. Institutional research offices should be consolidated, to centralize processing for IPEDS data submissions, and to improve capacity to use central knowledge to provide institutions with benchmarks and other metrics to help them assess their own performance. Lessons from public multi-campus systems that have been successful in reducing costs should be imported, and the work should be supported with individuals with expertise from outside of higher education who are less likely to fall victim to the academic culture. Work should include individuals knowledgeable about state and local regulation, who can both help cut through red tape, and also develop recommendations for changes in legislation should those be needed.

2) Deregulation of stovepipes keeping resources from being used more effectively. Public access institutions should be looking at resources to support student success – at least in the first two years – holistically, blending together funds for instruction, student services and academic support. Budget formulae, if they still exist, should be revised, to fund these together. Student services workload should be measured by headcount, and non-credit bearing courses should be counted equally. Institutions should be encouraged to develop reallocation and reinvestment strategies, to find savings and to reinvest resources into higher priority areas. Institutional leaders should be identified and encouraged to participate in experiments, such as those currently being tried among a group of public community college in California, to be freed of state regulation over spending in order to use their

funds more efficiently and effectively. These should be extended to encourage institutions to move away from credit and course-level funding mechanisms, to fund whole programs with a focus on learning and outcomes. The latter should be particularly helpful in breaking through some of the regulatory and reporting problems that get in the way of new thinking in developmental education.

3) Change funding formulae. States that have not moved toward funding on performance should do so, using student progress metrics appropriate to public access institutions. The metrics should include rewards for reducing early attrition, and investment pools for high impact educational practices such as first year learning communities, first-year seminars, common intellectual experiences, writing-intensive courses, and academic course redesign. They also should include attention to how the money is spent, not just to what happens to students. Institutions that show evidence of reducing administrative and support expenses along with improvements in student success should be recognized and rewarded for their efforts.

4) States and systems need to tackle the rising cost of employee benefits. The rising cost of employee benefits has got to be tackled. Examples of initiatives to do so are beginning to develop, such as the University of Maine System 'Bend the Trends" effort (which reduced the growth in health benefits by half), and the University of Nebraska effort to eliminate unfunded liabilities for retiree health costs. Benefit education kits should be prepared for governing board members, to educate them about the consequences of current trends, and to encourage action where they have the authority to do so, or legislative advocacy where not. (University of Maine, 2011).

Future Research

There is so much that isn't known about the relationship between resources and student learning that any research in this area will be helpful. There are a few topics that are more specifically focused on spending and effectiveness that could benefit from some additional work.

1) Service measures for student services, academic support, and administration. The existential problems that have impeded progress in cost analysis really apply to the instructional, research and public service. They are not that relevant with respect to the fifty percent of operating spending that goes for something else – for student services, for academic support, for administration. These areas should be much more susceptible to analytics to find optimum service levels, whether that is counseling support per 100 students, or internet service needs, or financial aid office staff. Experts in cost benchmarking from outside higher education should be brought together with experts in student

services, academic support and business management, to talk through opportunities and to devise recommendations for new ways to measure efficiency and effectiveness.

2) Cost models for developmental education. The single least functional area in public access institutions is developmental education. The funding and regulatory problems in developmental education are part of the problem. Work to find new approaches to developmental education need to be expanded to include explicit attention to funding and regulation along with changes in delivery. Consideration should be given to creating new funding and delivery models, to remove the pernicious incentives now in place for institutions to starve developmental education to create subsidies for other programs.

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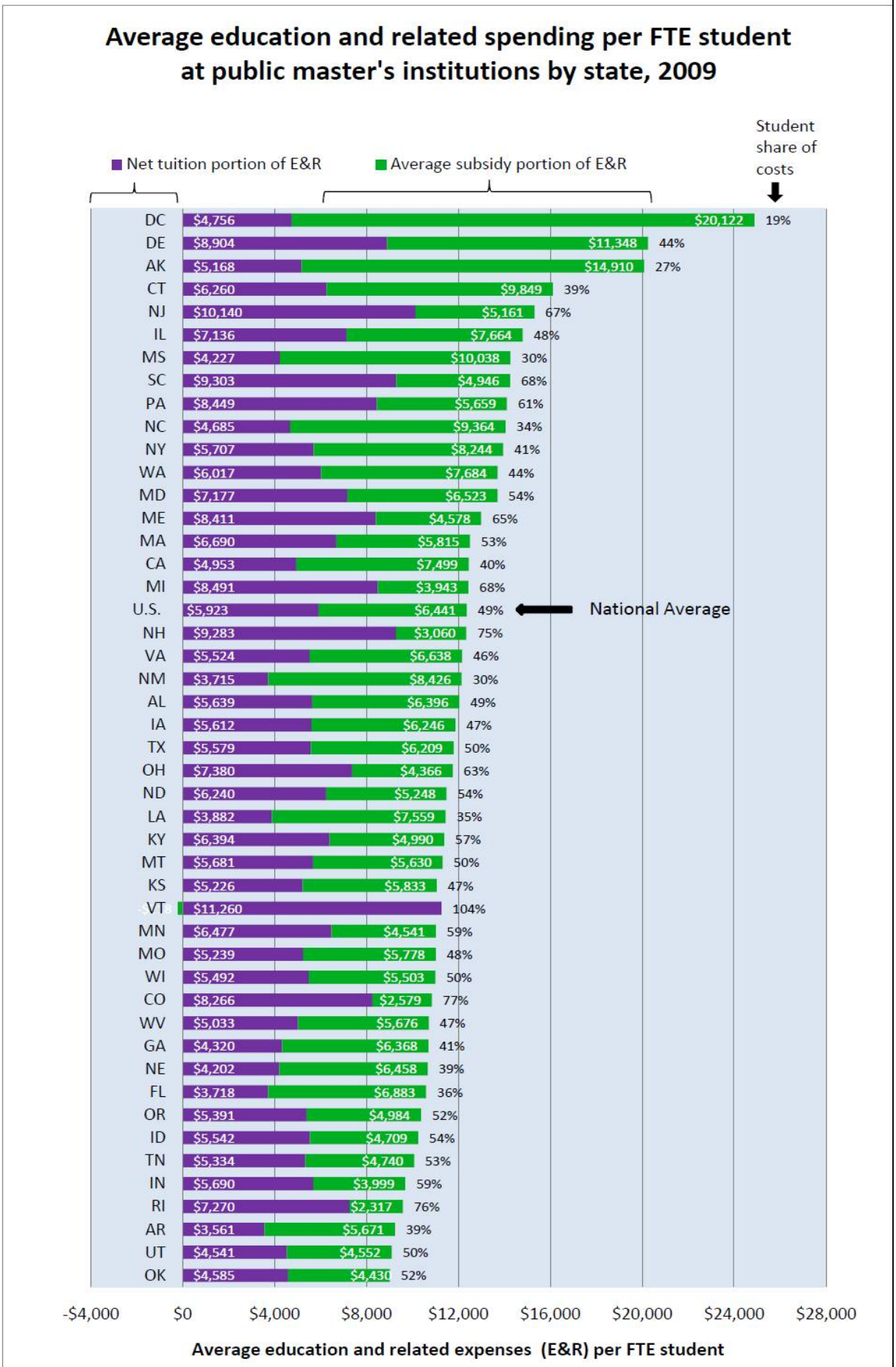
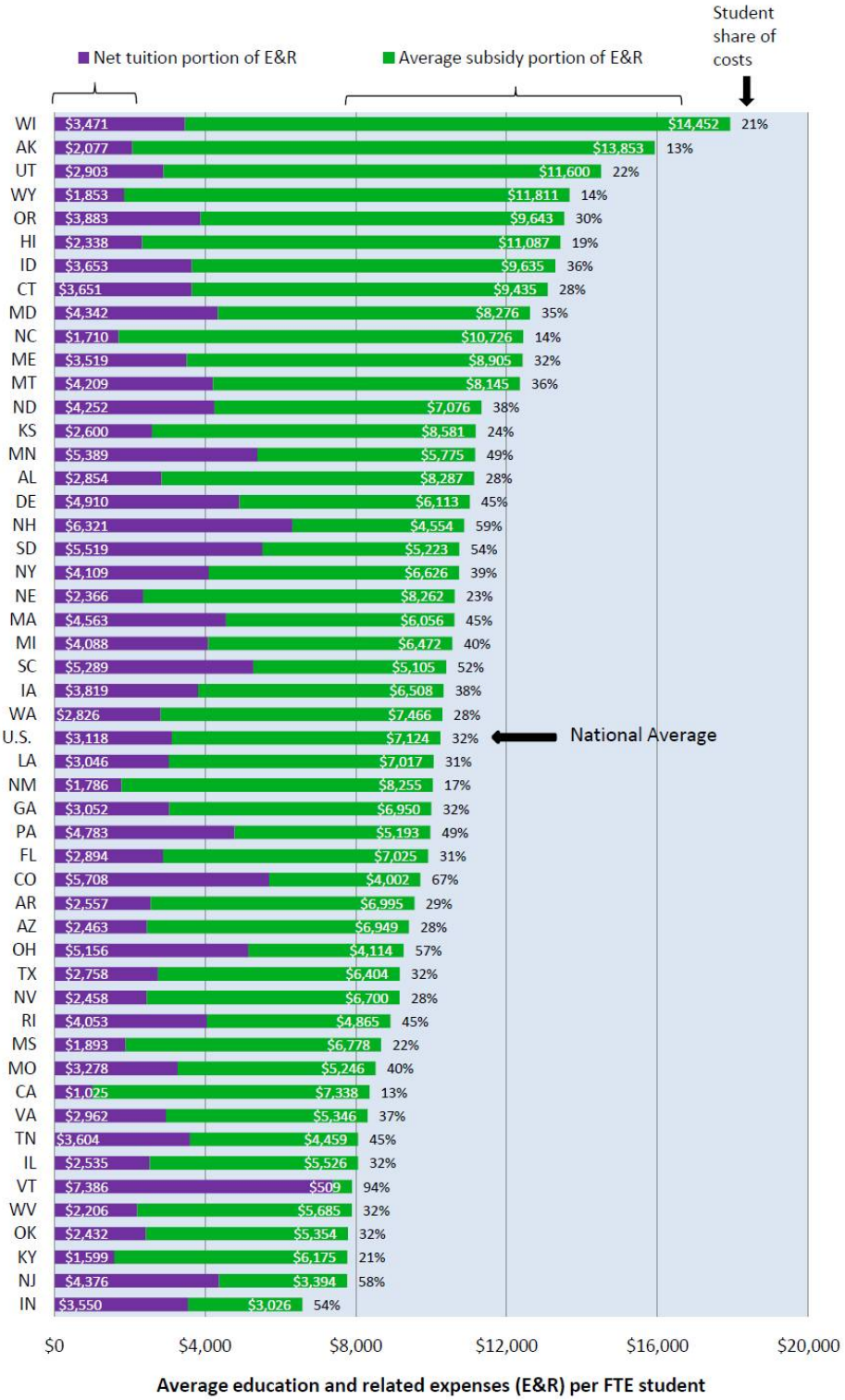
Appendix I: Variations among states in subsidy structures and E&R spending levels

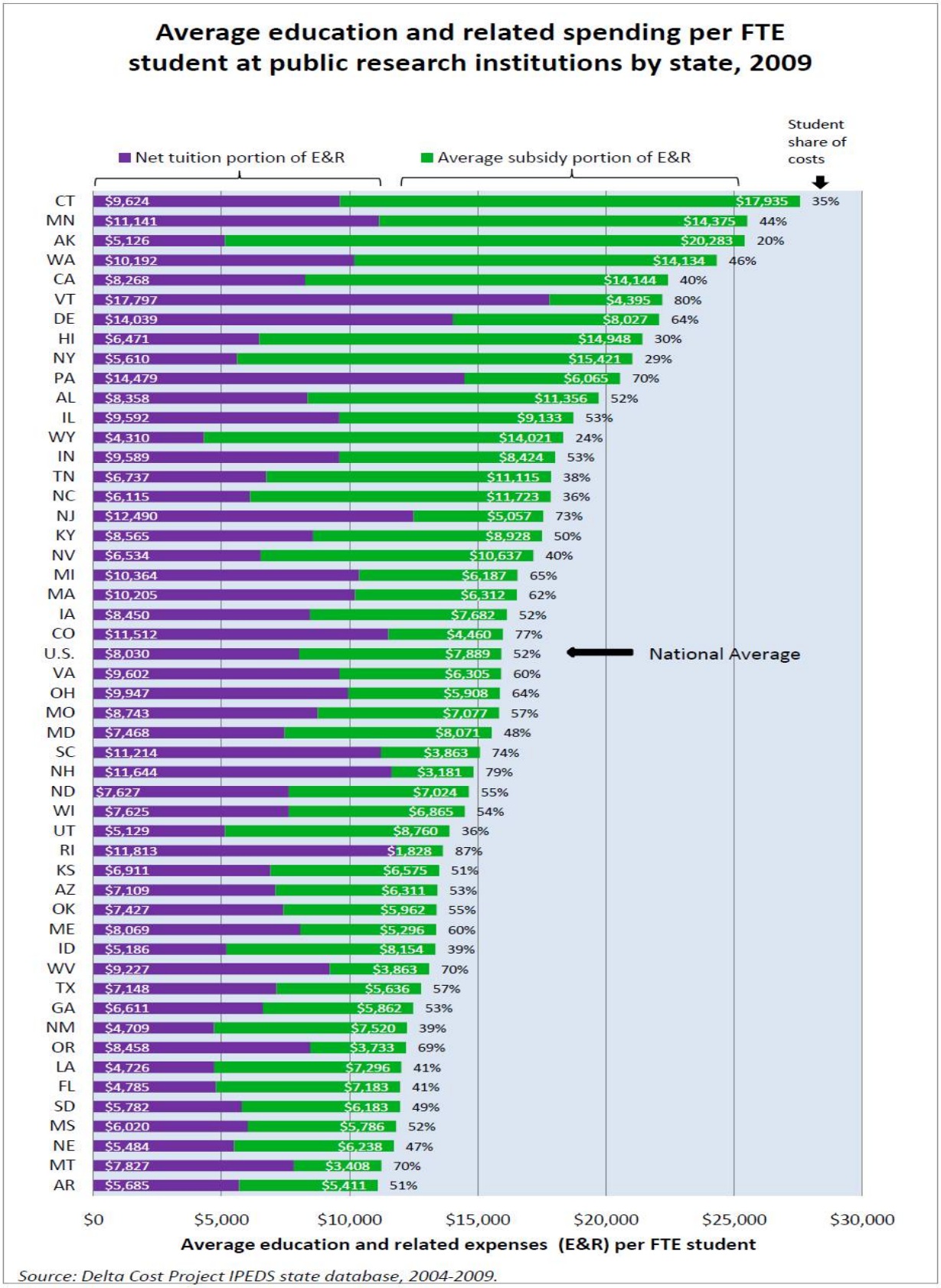


Source: Delta Cost Project IPEDS state database, 2004-2009.

Average education and related spending per FTE student at public community colleges by state, 2009



Source: Delta Cost Project IPEDS state database, 2004-2009.



Source: Delta Cost Project IPEDS state database, 2004-2009.

Minnesota State Colleges and Universities

Instructional Cost Study -- Lower Division (LD) -- By Classification of Instructional Progra

May 2011

	CIP Description	LD FYE	Fully Allocated Cost Per LD FYE
	Athletic Training/Trainer	49.85	5,035
	Allied Health & Med Assist Serv, Other	47.87	5,705
	Alternative & Complementary Med Sup	27.63	5,889
	Business/Corporate Communications	14.83	5,898
	Public Health	43.90	5,905
	Dietetics & Clinical Nutrition Serv	108.83	5,932
	Health Services/Allied Health Sci, Gen	95.43	5,935
	Psychology	5,733.39	6,083
	Philosophy And Religious Studies	3,271.51	6,112
	Sociology	3,889.47	6,173
	Science Technologies/Technicians	149.80	6,204
	Archaeology	6.00	6,228
	Health-Related Knowledge/Skills	429.16	6,274
	Anthropology	714.10	6,290
	Social Sciences, General	78.81	6,373
	Geography And Cartography	1,183.33	6,440
	Reserve Officer Training Corps	23.06	6,466
	History	2,632.00	6,496
	Political Science And Government	1,552.56	6,505
	Atmospheric Sciences And Meteorology	25.73	6,543
	Substance Abuse/Addiction Counseling	145.53	6,549
	Energy & Biologically Based Therapy	16.60	6,590
	Foods, Nutrition and Wellness Studies	39.70	6,617
	Speech And Rhetorical Studies	4,924.66	6,633
	Family & Consumer/Human Sci General	134.13	6,699
	Liberal Arts	689.06	6,713
	Dental Services & Allied Prof, Other	6.03	6,797
	Economics	2,407.74	6,801
	Community Health Serv/Liaison/Counseling	277.18	6,825
	Mathematics And Statistics	11,664.82	6,848
	Marketing	976.56	6,866
	Biological And Biomedical Sciences	8,052.01	6,903
	Basic Skills	2,672.97	6,917
	Astronomy And Astrophysics	168.94	6,931
	Interpersonal/Social Skills	56.33	6,939
	Computer/Info Technology Admin & Mgmt	108.44	6,987
	Business Admin, Mgmt & Oper	1,337.87	6,994
	Security & Protective Services, Other	49.37	7,005

Minnesota State Colleges and Universities

Instructional Cost Study -- Lower Division (LD) -- By Classification of Instructional Progra

May 2011

	Leisure/Recreational Activities	145.20	7,008
	Multi/Interdisciplinary Studies	661.48	7,022
	Data Entry/Microcomputer Application	210.42	7,057
	American Sign Language	268.73	7,101
	English Language And Literature, General	12,128.08	7,111
	Physical Sciences	144.25	7,136
	Area/Ethnic/Cultural/Gender Studies	1,306.46	7,140
	Geological & Earth Sciences/Geosciences	795.77	7,152
	Computer Software & Media Application	217.28	7,217
	Health Aides/Attendants/Orderlies	105.77	7,279
	Dance	11.30	7,285
	Parks, Recreation, Leisure & Fitness	3,033.46	7,303
	Work And Family Studies	161.30	7,341
	Psychiatric/Mental Health Serv Tech	29.63	7,352
	Chemistry	3,228.65	7,370
	Business/Managerial Economics	64.90	7,390
	Legal Support Services	457.67	7,418
	Business/Commerce, General	913.79	7,444
	Health And Medical Administrative Srv	965.50	7,457
	Fire Protection	331.67	7,480
	Criminal Justice And Corrections	1,541.00	7,507
	Animation/Interactive Tech/Video Graphic	13.10	7,550
	Rehab & Therapeutic Professions	19.67	7,561
	Gen Sales, Merch & Related Mkt Oper	441.11	7,625
	Human Resources Mgmt & Serv	119.29	7,686
	Natural Resources & Conservation	597.82	7,695
	Physics	1,579.79	7,717
	Human Develop/Family Studies, Other	459.40	7,743
	Movement & Mind-Body Ther/Educ	5.33	7,746
	Computer And Information Sciences, Genrl	1,322.52	7,746
	Foreign Languages And Literatures	1,938.75	7,757
	Business Oper Support & Asst Serv	1,761.17	7,793
	Accounting & Related Services	2,825.72	7,831
	Public Administration & Social Service	613.90	7,842
	Construction Trades, General	15.43	7,849
	Communication, Journalism & Related Prog	1,267.79	7,907
	Computer Systems Networking & Telecomm	755.60	7,917
	Industrial Design	206.20	7,921
	Fine and Studio Art	2,669.99	7,944
	Urban Studies/Affairs	119.80	7,962
	Environmental Control Technologies	105.44	7,982
	Prepress/Desktop Publish& Digital Design	113.26	8,017
	Apparel And Textiles	43.20	8,079

LD	8,686
UD	11,109

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	Bldg/Construction Finishing And Mgmt	305.51	8,081	MA	10,965
	Computer Engineering Technologies	442.44	8,085	D	17,005
	Welding Technology/Welder	804.91	8,142		
	Engineering, General	167.21	8,143		
	Finance/Financial Management Serv	116.89	8,220		
	Film/Video And Photographic Arts	372.44	8,241		
	Computer Programming	399.98	8,316		
	Emerg Med Technology/Tech (Paramedic)	889.08	8,382		
	Communication Disorders Sciences And Srv	182.30	8,474		
	Agricultural Production Operations	227.17	8,495		
	Agricultural Mechanization	34.50	8,541		
	Agriculture, General	27.43	8,557		
	Graphic Design	181.07	8,568		
	Heavy/Industrial Equip Maintenance Tech	362.27	8,592		
	Visual And Performing Arts, General	12.77	8,606		
	Plant Sciences	44.10	8,623		
	Law Enforcement Skills Program ONLY	549.45	8,624		
			46		
	Watchmaking And Jewelrymaking	55.53	8,675		
	Music	1,704.86	8,684		
	Drama/Theatre Arts and Stagecraft	882.54	8,693		
	Somatic Bodywork & Related Ther Serv	197.64	8,725		
	Construction Management	19.04	8,833		
	Plumbing & Related Water Supply Serv	240.23	8,837		
	Medical/Clinical Assistant	278.57	8,854		
	Heating, Air Cond, Refrig Maint Tech	483.53	8,889		
	Electromechanical Instrumentation & Main	190.06	8,930		
	Nursing Assistant/Aide	844.60	8,996		
	Computer Science	572.40	9,016		
	Education	1,272.92	9,061		
	Commercial & Advertising Art	175.57	9,146		
	Culinary Arts And Related Services	420.20	9,155		
	Industrial Production Technologies	507.44	9,177		
	Electrical & Power Transmission Install	1,132.96	9,221		
	Library Science	9.07	9,334		
	Cosmetology & Related Pers Grooming Serv	496.70	9,394		
	Commercial Photography	97.00	9,408		
	Management Info Systems & Services	360.91	9,458		
	Insurance	16.30	9,556		
	Engineering-Related Technologies	174.87	9,573		
	Occupational Skills Program - ONLY	94.77	9,595		
	Construction Engineering Technologies	36.60	9,598		
	Vehicle Maintenance & Repair Tech	2,365.23	9,626		

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	Real Estate	12.57	9,629
	Civil Engineering	15.47	9,676
	Precision Metal Working	646.22	9,717
	Licensed Practical Nurse (LPN)	2,457.97	9,743
	Drafting/Design Engineering Techn	674.21	9,754
	Civil Engineering Technologies	210.74	9,757
	Electrical Engineering Technologies	378.57	9,843
	Med Radiologic Tech/Sci-Rad Therapist	47.13	9,861
	Physical Therapist Assistant	105.83	9,914
	Musical Instrument Fabrication/Repair	109.47	9,939
	Electrical & Electronics Maint/Repr	82.66	9,948
	Interior Design	163.77	9,961
	Hospitality Administration/Mgmt	104.21	10,040
	Gunsmith	25.17	10,046
	Emerg Care Attendant (Ambulance)	78.61	10,079
	Radio, Television & Digital Communication	71.41	10,117
	Counseling Psychology ONLY	137.30	10,130
	Audiovisual Comm Technology/Technician	132.50	10,184
	Airframe Mechanic/Aircraft Maint Tech	63.77	10,202
	Radiologic Tech/Science-Radiographer	216.57	10,234
	Information Science/Studies	38.27	10,395
	Dental Assisting/Assistant	493.57	10,473
	Applied Horticulture/Horticultural Serv	247.46	10,604
	Clinical/Medical Lab Science	238.79	10,684
	International Relations And Affairs	5.43	10,728
	Woodworking	122.84	10,789
	Pharmacy Technician/Assistant	50.93	11,034
	Occupational Therapist Assistant	57.73	11,180
	Ground Transportation	203.00	11,350
	Aircraft Powerplant Technology	7.60	11,392
	Mechanical Engineering-related Techn	22.06	11,480
	Computer Typography & Composition Eq Op	16.50	11,484
	Agricultural & Food Products Processing	2.43	11,514
	Cardiovascular Technology/Technician	28.30	11,538
	Agricultural Business And Management	1,058.27	11,611
	Carpenters	511.94	11,626
	Mason/Masonry	41.23	11,711
	Veterinary/Animal Health Tech/Assistant	142.67	11,736
	Graphic & Printing Equip Operator, Gen	45.63	11,771
	Orthotist/Prosthetist	95.13	11,899
	Air Transportation	199.16	12,024
	Surgical Technology/Technologist	140.60	12,046
	Allied Health Diag, Interv, Trtmnt,Othr	9.27	12,178

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May 2011

	Nursing/Registered Nurse	2,191.68	12,309
	Respiratory Care Therapy/Therapist	111.90	12,334
	Electroneurodiagnostic Technology/Tech	15.83	12,390
	Mechanical Engineering	61.87	12,621
	Printing Press Operator	11.80	12,623
	Quality Control And Safety Technologies	9.33	12,628
	Specialized Sales, Merch & Related Mkt	21.23	12,854
	Entrepreneurial/Small Business Oper	126.62	12,871
	Diag Med Sonography/Ultrasound Tech	33.16	12,921
	Construction/Heavy Equipment/Earthmoving Equipment Operation	134.10	12,944
	Industrial Engineering	40.33	13,430
	Electrical Electronics Communication Eng	79.30	13,647
	Agricultural & Domestic Animal Services	12.07	13,881
	Dental Hygiene/Hygienist	198.31	17,343
	Materials Engineering	25.90	21,440
		127,807.39	1,601,932
			8,566

University Budget Committee
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The University Budget Committee recommends that state appropriated funds be allocated to the primary academic units in FY2009 (after state funds are first directed to special legislative appropriations and clearly identified University priorities.) Funds are allocated based on weighted student credit hours of instruction by each primary academic unit on campus. The weights are based on cost of instruction, and are a combination of weights utilized by the Missouri Council on Public Higher Education (COPHE) Study and a modified version of the Texas Higher Education Coordinating Board system.

The weights used in the COPHE study were derived from the state formula funding model proposed by Coordinating Board for Higher Education for institutions of higher education in the State of Missouri. The study divides academic disciplines into five clusters using cost per credit hour as determined by the National Study of Instructional Costs and Productivity Study (the Delaware Cost Study). Cost of instruction in the Delaware study, which includes benchmark data from approximately 400 institutions, is based on salaries, benefits and operating expenses in current funds for on-campus academic instruction, community education and off-campus academic instruction. The COPHE model then goes beyond the Delaware Study and differentiates instructional cost among student levels; the student level weights were obtained from research conducted by Dr. Howard Bowen.

The Texas Higher Education Coordinating Board funding formula also recognizes that instruction cost differs by discipline and student level. Weights in this model were derived by calculating educational costs for various academic disciplines and student levels within the Texas system (approximately 35 academic institutions). Educational costs included in the Texas model include faculty costs, academic support, institutional support, student services, research and departmental operating expenses in all funds.

Although both the COPHE and Texas models weigh instruction by both discipline and student level, the two studies differ in what is included in educational costs; therefore, the weights varied greatly for some disciplines and student levels between the two models. Both models had merit, and the UBC recognized it would be difficult to make an impartial decision favoring one weighting system over the other. Therefore, the UBC recommended to the Chancellor that a weighting system which blended the two methodologies equally be used to allocate state appropriations.

Additionally, during the development of the UBC recommendations, certain adjustments were made as omissions or extreme variances in either or both models were discovered during the budget model drafting process.

- The Texas system did not specifically address professional Schools of Medicine or Dentistry; therefore, at the Chancellor's suggestion, the weights for UMKC using the Texas model for these two disciplines were adjusted to 1.25 times the Pharmacy weight.
- Weights for the Law School varied greatly between 3.55 in the Texas model for first professional students and 8.35 in the COPHE model. The Chancellor had noted this and proposed a compromise weight of 4.72 for Law School instruction (which was the weighting factor originally included in the UBC's March 26, 2007 recommendation) in the modified version of the Texas model weights he suggested the UBC consider.
- There was also a fairly significant difference between the results of the modified Texas weights and the COPHE approach for A & S. Accordingly the UBC recommended that if the 50/50 blend of the two approaches were adopted (as it ultimately was), $682,178 of expenses previously in the A & S budget, for items with wide benefit across the campus, be moved to the Appendix 5 assessments on all of the primary academic units. That adjustment is reflected in Appendix 5.

- Adjustments were made to weights in the School of Biological Sciences in both the COPHE and Texas model to account for that unit's unique teaching mission to first professional students in the health sciences.

The following table compares the weights between each model for each academic disciplines and student level.

	COPHE Formula		Texas Formula	
CRSE_DEPT	Level	**Weighting Factor**	Level	**Weighting Factor**
ANTHROPOLOGY	1. Lower Division	1.00	1. Lower Division	1.00
	2. Upper Division	1.50	2. Upper Division	1.77
	3. Masters	2.10	3. Masters	4.01
	4. Doctors	3.00	4. Doctors	9.94
	5. UGrad Med	1.00	5. UGrad Med	1.00
	6. 1st Prof	1.00	6. 1st Prof	1.00
ARCH, URBAN PLNG AND DESIGN	1. Lower Division	1.84	1. Lower Division	1.00
	2. Upper Division	2.76	2. Upper Division	1.77
	3. Masters	3.86	3. Masters	4.01
	4. Doctors	5.52	4. Doctors	9.94
	5. UGrad Med	1.84	5. UGrad Med	1.00
	6. 1st Prof	1.84	6. 1st Prof	1.00
ART AND ART HISTORY	1. Lower Division	1.00	1. Lower Division	1.00
	2. Upper Division	1.50	2. Upper Division	2.51
	3. Masters	2.10	3. Masters	5.65
	4. Doctors	3.00	4. Doctors	9.78
	5. UGrad Med	1.00	5. UGrad Med	1.50
	6. 1st Prof	1.00	6. 1st Prof	1.50
CHEMISTRY	1. Lower Division	1.51	1. Lower Division	1.50
	2. Upper Division	2.26	2. Upper Division	2.93
	3. Masters	3.17	3. Masters	7.29
	4. Doctors	4.53	4. Doctors	20.05
	5. UGrad Med	1.51	5. UGrad Med	1.67
	6. 1st Prof	1.51	6. 1st Prof	1.67

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	COPHE Formula		Texas Formula	
COMMUNICATION STUDIES	1. Lower Division	1.00	1. Lower Division	1.00
	2. Upper Division	1.50	2. Upper Division	1.77
	3. Masters	2.10	3. Masters	4.01
	4. Doctors	3.00	4. Doctors	9.94
	5. UGrad Med	1.00	5. UGrad Med	1.00
	6. 1st Prof	1.00	6. 1st Prof	1.00
CRIMINAL JUSTICE	1. Lower Division	1.00	1. Lower Division	1.00
	2. Upper Division	1.50	2. Upper Division	1.77
	3. Masters	2.10	3. Masters	4.01
	4. Doctors	3.00	4. Doctors	9.94
	5. UGrad Med	1.00	5. UGrad Med	1.00
	6. 1st Prof	1.00	6. 1st Prof	1.00
ECONOMICS	1. Lower Division	1.00	1. Lower Division	1.00
	2. Upper Division	1.50	2. Upper Division	1.77
	3. Masters	2.10	3. Masters	4.01
	4. Doctors	3.00	4. Doctors	9.94
	5. UGrad Med	1.00	5. UGrad Med	1.00
	6. 1st Prof	1.00	6. 1st Prof	1.00
ENGLISH LANGUAGE AND LIT	1. Lower Division	1.00	1. Lower Division	1.00
	2. Upper Division	1.50	2. Upper Division	1.77
	3. Masters	2.10	3. Masters	4.01
	4. Doctors	3.00	4. Doctors	9.94
	5. UGrad Med	1.00	5. UGrad Med	1.00
	6. 1st Prof	1.00	6. 1st Prof	1.00
FOREIGN LANGUAGES AND LIT	1. Lower Division	1.00	1. Lower Division	1.00
	2. Upper Division	1.50	2. Upper Division	1.77
	3. Masters	2.10	3. Masters	4.01
	4. Doctors	3.00	4. Doctors	9.94
	5. UGrad Med	1.00	5. UGrad Med	1.00
	6. 1st Prof	1.00	6. 1st Prof	1.00

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	COPHE Formula		Texas Formula	
GENERAL STUDIES	1. Lower Division	1.00	1. Lower Division	1.00
	2. Upper Division	1.50	2. Upper Division	1.77
	3. Masters	2.10	3. Masters	4.01
	4. Doctors	3.00	4. Doctors	9.94
	5. UGrad Med	1.00	5. UGrad Med	1.00
	6. 1st Prof	1.00	6. 1st Prof	1.00
GEOSCIENCES	1. Lower Division	1.51	1. Lower Division	1.00
	2. Upper Division	2.26	2. Upper Division	2.93
	3. Masters	3.17	3. Masters	7.29
	4. Doctors	4.53	4. Doctors	20.05
	5. UGrad Med	1.51	5. UGrad Med	1.67
	6. 1st Prof	1.51	6. 1st Prof	1.67
HISTORY	1. Lower Division	1.00	1. Lower Division	1.67
	2. Upper Division	1.50	2. Upper Division	1.77
	3. Masters	2.10	3. Masters	4.01
	4. Doctors	3.00	4. Doctors	9.94
	5. UGrad Med	1.00	5. UGrad Med	1.00
	6. 1st Prof	1.00	6. 1st Prof	1.00
INTERDEPARTMENTAL - A&S	1. Lower Division	1.51	1. Lower Division	1.00
	2. Upper Division	2.26	2. Upper Division	1.77
	3. Masters	3.17	3. Masters	4.01
	4. Doctors	4.53	4. Doctors	9.94
	5. UGrad Med	1.51	5. UGrad Med	1.00
	6. 1st Prof	1.51	6. 1st Prof	1.00
MATHEMATICS AND STATISTICS	1. Lower Division	1.00	1. Lower Division	1.00
	2. Upper Division	1.50	2. Upper Division	1.77
	3. Masters	2.10	3. Masters	4.01
	4. Doctors	3.00	4. Doctors	9.94
	5. UGrad Med	1.00	5. UGrad Med	1.00
	6. 1st Prof	1.00	6. 1st Prof	1.00

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	COPHE Formula		Texas Formula	
PHILOSOPHY	1. Lower Division	1.00	1. Lower Division	1.00
	2. Upper Division	1.50	2. Upper Division	1.77
	3. Masters	2.10	3. Masters	4.01
	4. Doctors	3.00	4. Doctors	9.94
	5. UGrad Med	1.00	5. UGrad Med	1.00
	6. 1st Prof	1.00	6. 1st Prof	1.00
PHYSICS	1. Lower Division	1.51	1. Lower Division	1.00
	2. Upper Division	2.26	2. Upper Division	2.93
	3. Masters	3.17	3. Masters	7.29
	4. Doctors	4.53	4. Doctors	20.05
	5. UGrad Med	1.51	5. UGrad Med	1.67
	6. 1st Prof	1.51	6. 1st Prof	1.67
POLITICAL SCIENCE	1. Lower Division	1.00	1. Lower Division	1.00
	2. Upper Division	1.50	2. Upper Division	1.77
	3. Masters	2.10	3. Masters	4.01
	4. Doctors	3.00	4. Doctors	9.94
	5. UGrad Med	1.00	5. UGrad Med	1.00
	6. 1st Prof	1.00	6. 1st Prof	1.00
PSYCHOLOGY	1. Lower Division	1.00	1. Lower Division	1.00
	2. Upper Division	1.50	2. Upper Division	1.77
	3. Masters	2.10	3. Masters	4.01
	4. Doctors	3.00	4. Doctors	9.94
	5. UGrad Med	1.00	5. UGrad Med	1.00
	6. 1st Prof	1.00	6. 1st Prof	1.00
SOCIAL WORK	1. Lower Division	1.84	1. Lower Division	1.89
	2. Upper Division	2.76	2. Upper Division	2.09
	3. Masters	3.86	3. Masters	3.76
	4. Doctors	5.52	4. Doctors	12.21
	5. UGrad Med	1.84	5. UGrad Med	1.89
	6. 1st Prof	1.84	6. 1st Prof	1.89

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	COPHE Formula		Texas Formula	
SOCIOLOGY	1. Lower Division	1.00	1. Lower Division	1.89
	2. Upper Division	1.50	2. Upper Division	1.77
	3. Masters	2.10	3. Masters	4.01
	4. Doctors	3.00	4. Doctors	9.94
	5. UGrad Med	1.00	5. UGrad Med	1.00
	6. 1st Prof	1.00	6. 1st Prof	1.00
THEATRE	1. Lower Division	1.51	1. Lower Division	1.00
	2. Upper Division	2.26	2. Upper Division	2.51
	3. Masters	3.17	3. Masters	5.65
	4. Doctors	4.53	4. Doctors	9.78
	5. UGrad Med	1.51	5. UGrad Med	1.50
	6. 1st Prof	1.51	6. 1st Prof	1.50
A & S Total				
BIOLOGICAL SCIENCES	1. Lower Division	1.84	1. Lower Division	1.84
	1. Lower Div - Health Sci	2.77	1. Lower Div - Health Sci	2.77
	2. Upper Division	2.93	2. Upper Division	2.93
	2. Upper Div - Health Sci	4.15	2. Upper Div - Health Sci	4.15
	3. Masters	3.86	3. Masters	7.29
	4. Doctors	5.52	4. Doctors	20.05
	5. UGrad Med	1.84	5. UGrad Med	1.67
	6. 1st Prof	1.84	6. 1st Prof	1.67
BIOL Total				
BUSINESS AND PUBLIC ADMIN	1. Lower Division	1.51	1. Lower Division	1.18
	2. Upper Division	2.26	2. Upper Division	1.68
	3. Masters	3.17	3. Masters	3.70
	4. Doctors	4.53	4. Doctors	19.08
	5. UGrad Med	1.51	5. UGrad Med	1.18
	6. 1st Prof	1.51	6. 1st Prof	1.18
BUS A Total				

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	COPHE Formula		Texas Formula	
CIVIL ENGINEERING	1. Lower Division	3.34	1. Lower Division	2.46
	2. Upper Division	5.01	2. Upper Division	3.51
	3. Masters	7.10	3. Masters	7.39
	4. Doctors	10.02	4. Doctors	17.05
	5. UGrad Med	3.34	5. UGrad Med	2.46
	6. 1st Prof	8.35	6. 1st Prof	2.46
COMPUTER SCIENCE PROGRAM	1. Lower Division	3.34	1. Lower Division	2.46
	2. Upper Division	5.01	2. Upper Division	3.51
	3. Masters	7.01	3. Masters	7.39
	4. Doctors	10.02	4. Doctors	17.05
	5. UGrad Med	3.34	5. UGrad Med	2.46
	6. 1st Prof	8.35	6. 1st Prof	2.46
COORD UNDERGRAD ENGINEERING	1. Lower Division	3.34	1. Lower Division	2.46
	2. Upper Division	5.01	2. Upper Division	3.51
	3. Masters	7.01	3. Masters	7.39
	4. Doctors	10.02	4. Doctors	17.05
	5. UGrad Med	3.34	5. UGrad Med	2.46
	6. 1st Prof	8.35	6. 1st Prof	2.46
ELECTRICAL AND COMP ENGIN	1. Lower Division	3.34	1. Lower Division	2.46
	2. Upper Division	5.01	2. Upper Division	3.51
	3. Masters	7.01	3. Masters	7.39
	4. Doctors	10.02	4. Doctors	17.05
	5. UGrad Med	3.34	5. UGrad Med	2.46
	6. 1st Prof	8.35	6. 1st Prof	2.46
MECHANICAL ENGINEERING	1. Lower Division	3.34	1. Lower Division	2.46
	2. Upper Division	5.01	2. Upper Division	3.51
	3. Masters	7.01	3. Masters	7.39
	4. Doctors	10.02	4. Doctors	17.05
	5. UGrad Med	3.34	5. UGrad Med	2.46
	6. 1st Prof	8.35	6. 1st Prof	2.46
SCE Total				

University Budget Committee
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	COPHE Formula		Texas Formula	
MUSIC (CONSERVATORY)	1. Lower Division	1.51	1. Lower Division	1.50
	2. Upper Division	2.26	2. Upper Division	2.51
	3. Masters	3.17	3. Masters	5.65
	4. Doctors	4.53	4. Doctors	9.78
	5. UGrad Med	1.51	5. UGrad Med	1.50
	6. 1st Prof	1.51	6. 1st Prof	1.50
CONSR Total				
DENTISTRY (SCHOOL)	1. Lower Division	3.34	1. Lower Division	2.20
	2. Upper Division	5.01	2. Upper Division	4.81
	3. Masters	7.01	3. Masters	18.63
	4. Doctors	10.02	4. Doctors	31.59
	5. UGrad Med	3.34	5. UGrad Med	2.20
	6. 1st Prof	8.35	6. 1st Prof	6.41
DENT Total				
COUNSELING PSYCHOLOGY	1. Lower Division	1.51	1. Lower Division	1.89
	2. Upper Division	2.26	2. Upper Division	2.09
	3. Masters	3.17	3. Masters	3.76
	4. Doctors	4.53	4. Doctors	12.21
	5. UGrad Med	1.51	5. UGrad Med	1.89
	6. 1st Prof	1.51	6. 1st Prof	1.89
EDUCATION (SCHOOL)	1. Lower Division	1.51	1. Lower Division	1.33
	2. Upper Division	2.26	2. Upper Division	1.79
	3. Masters	3.17	3. Masters	2.68
	4. Doctors	4.53	4. Doctors	7.70
	5. UGrad Med	1.51	5. UGrad Med	1.33
	6. 1st Prof	1.51	6. 1st Prof	1.33
PHYSICAL EDUCATION	1. Lower Division	1.51	1. Lower Division	1.33
	2. Upper Division	2.26	2. Upper Division	1.79
	3. Masters	3.17	3. Masters	2.68
	4. Doctors	4.53	4. Doctors	7.70
	5. UGrad Med	1.51	5. UGrad Med	1.33
	6. 1st Prof	1.51	6. 1st Prof	1.33
EDUCATION TOTAL				

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	COPHE Formula		Texas Formula	
INTERDIVISIONAL - GRADUATE	1. Lower Division	1.00	1. Lower Division	1.00
	2. Upper Division	1.50	2. Upper Division	1.77
	3. Masters	2.10	3. Masters	4.01
	4. Doctors	3.00	4. Doctors	9.94
	5. UGrad Med	1.00	5. UGrad Med	1.00
	6. 1st Prof	1.00	6. 1st Prof	1.00
INTERDIVISIONAL – GRADUATE TOTAL				
LAW (SCHOOL)	1. Lower Division	3.34	1. Lower Division	4.72
	2. Upper Division	5.01	2. Upper Division	4.72
	3. Masters	7.01	3. Masters	4.72
	4. Doctors	10.02	4. Doctors	4.72
	5. UGrad Med	3.34	5. UGrad Med	4.72
	6. 1st Prof	8.35	6. 1st Prof	4.72
.				
LAW TOTAL				
MEDICINE (SCHOOL)	1. Lower Division	3.34	1. Lower Division	2.20
	2. Upper Division	5.01	2. Upper Division	4.81
	3. Masters	7.01	3. Masters	18.63
	4. Doctors	10.02	4. Doctors	31.59
	5. UGrad Med	3.34	5. UGrad Med	2.20
	6. 1st Prof	8.35	6. 1st Prof	6.41
MEDICINE TOTAL				
NURSING (SCHOOL)	1. Lower Division	2.19	1. Lower Division	2.73
	2. Upper Division	3.28	2. Upper Division	3.24
	3. Masters	4.60	3. Masters	5.36
	4. Doctors	6.57	4. Doctors	11.79
	5. UGrad Med	2.19	5. UGrad Med	2.73
	6. 1st Prof	5.48	6. 1st Prof	2.73
NURSING TOTAL				
PHARMACY (SCHOOL)	1. Lower Division	2.19	1. Lower Division	1.76
	2. Upper Division	3.28	2. Upper Division	3.85
	3. Masters	4.60	3. Masters	14.90
	4. Doctors	10.02	4. Doctors	25.27
	5. UGrad Med	2.19	5. UGrad Med	1.76
	6. 1st Prof	5.48	6. 1st Prof	5.13

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