

## ATTACHMENT B

### Preliminary Cost-Driver Models: Predicting Total, Education-Related, and Instructional Expenditures for Public Four-Year Institutions

Following our Cost-Driver meeting back in September 2014, with your input, NCHEMS has conducted several regression analyses to determine the most predictive factors of expenditures for colleges and universities. The following tables are the results of our first analyses. We will walk through these, and have will have additional ideas to bring to the table on Monday. We value your input, and will also discuss strategies for community colleges. We look forward to the meeting.

Model 1: Dependent Variable = Total Expenditures (Minus Hospital and Auxiliary Expenses) per FTE

Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.899 <sup>a</sup>	.808	.797	5444.173

a. Predictors: (Constant), OM\_Total\_Exp, Percent Part-Time Enrollment, Undergraduate Students, Fall 2011, Town, Rural, Benefits\_Total\_EXP, Masters, Percent Undergraduate Underrepresented Minorities , Unduplicated Graduate Headcount Percent, 2011-12, Suburb, Cost Adjusted Undergraduate Degrees per Undergraduate Degrees, Land Grant Institution, County Median Family Income, 2008-12 (In 2012 Dollars), Percent Full-Time Faculty, Depreciation per FTE, CIP-6 Undergraduate Programs with Completers (Not by level), 2011-12, Cost Adjusted Graduate Degrees per Graduate Degrees, Institution grants a medical degree, Research per Full-Time Faculty, ACT Composite 50th percentile (Weighted Average ACT Composite and SAT-to-ACT Conversion), PCT\_Faculty, Total Instructional Staff - Weighted monthly salary 2012-13, Undergraduate Enrollment, Age 25 and Over, Percent, Fall 2011, Bachelors Sector, Total Annual FTE, academic year 2011-12, Percent of full-time first-time undergraduates receiving Pell grants, 2011-12, CIP-6 Graduate Programs with Completers (Not by level), 2011-12

b. Dependent Variable: Total Expenditures (Minus Hospital and Auxiliary) per FTE



Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-44439.917	7000.604		-6.348	.000
	Masters	1410.036	911.193	.058	1.547	.122
	Bachelors Sector	4790.315	1445.356	.149	3.314	.001
	Suburb	-226.778	734.960	-.007	-.309	.758
	Town	463.827	713.915	.017	.650	.516
	Rural	882.530	1279.762	.016	.690	.491
	County Median Family Income, 2008-12 (In 2012 Dollars)	.043	.024	.053	1.837	.067
	Total Annual FTE, academic year 2011-12	-.223	.060	-.201	-3.727	.000
	ACT Composite 50th percentile (Weighted Average ACT Composite and SAT-to-ACT Conversion)	325.231	172.790	.076	1.882	.060
	Percent Part-Time Enrollment, Undergraduate Students, Fall 2011	-30.758	37.053	-.031	-.830	.407
	Percent of full-time first-time undergraduates receiving Pell grants, 2011-12	-59.818	35.350	-.085	-1.692	.091
	Percent Undergraduate Underrepresented Minorities	97.743	20.322	.203	4.810	.000
	Undergraduate Enrollment, Age 25 and Over, Percent, Fall 2011	92.716	42.821	.087	2.165	.031
	Unduplicated Graduate Headcount Percent, 2011-12	44.110	37.634	.038	1.172	.242
	CIP-6 Undergraduate Programs with Completers (Not by level), 2011-12	21.104	18.390	.049	1.148	.252

CIP-6 Graduate Programs with Completers (Not by level), 2011-12	50.001	23.736	.145	2.107	.036
Research per Full-Time Faculty	.070	.007	.337	9.960	.000
Institution grants a medical degree	5986.250	1083.699	.175	5.524	.000
Land Grant Institution	-44.074	951.889	-.001	-.046	.963
Percent Full-Time Faculty	138.145	24.101	.172	5.732	.000
Faculty as a percent of all employees	148.094	40.231	.130	3.681	.000
Total Instructional Staff - Weighted monthly salary 2012-13	1.401	.284	.184	4.931	.000
Cost Adjusted Undergraduate Degrees per Undergraduate Degrees	4932.792	2045.325	.064	2.412	.016
Cost Adjusted Graduate Degrees per Graduate Degrees	-314.805	320.529	-.032	-.982	.327
Benefits as a percent of total expenditures	412.176	74.421	.128	5.538	.000
Depreciation per FTE	4.182	.342	.397	12.226	.000
Operation and maintenance as a percent of total expenditures	211.571	84.229	.060	2.512	.012

a. Dependent Variable: Total Expenditures (Minus Hospital and Auxiliary) per FTE

## Model 2: Dependent Variable = Education-Related Expenditures per FTE

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.730 <sup>a</sup>	.534	.507	4278.277

a. Predictors: (Constant), OM\_Total\_Exp, Percent Part-Time Enrollment, Undergraduate Students, Fall 2011, Town, Rural, Benefits\_Total\_EXP, Masters, Percent Undergraduate Underrepresented Minorities , Unduplicated Graduate Headcount Percent, 2011-12, Suburb, Cost Adjusted Undergraduate Degrees per Undergraduate Degrees, Land Grant Institution, County Median Family Income, 2008-12 (In 2012 Dollars), Percent Full-Time Faculty, Depreciation per FTE, CIP-6 Undergraduate Programs with Completers (Not by level), 2011-12, Cost Adjusted Graduate Degrees per Graduate Degrees, Institution grants a medical degree, Research per Full-Time Faculty, ACT Composite 50th percentile (Weighted Average ACT Composite and SAT-to-ACT Conversion), PCT\_Faculty, Total Instructional Staff - Weighted monthly salary 2012-13, Undergraduate Enrollment, Age 25 and Over, Percent, Fall 2011, Bachelors Sector, Total Annual FTE, academic year 2011-12, Percent of full-time first-time undergraduates receiving Pell grants, 2011-12, CIP-6 Graduate Programs with Completers (Not by level), 2011-12

b. Dependent Variable: Education Related Expenditures per FTE

Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-35936.272	5501.390		-6.532	.000
	Masters	336.787	716.057	.028	.470	.638
	Bachelors Sector	3627.937	1135.826	.224	3.194	.001
	Suburb	-290.004	577.565	-.019	-.502	.616
	Town	547.247	561.027	.040	.975	.330
	Rural	721.822	1005.695	.025	.718	.473
	County Median Family Income, 2008-12 (In 2012 Dollars)	.050	.019	.120	2.676	.008
	Total Annual FTE, academic year 2011-12	-.137	.047	-.245	-2.919	.004
	ACT Composite 50th percentile (Weighted Average ACT Composite and SAT-to-ACT Conversion)	162.607	135.786	.075	1.198	.232
	Percent Part-Time Enrollment, Undergraduate Students, Fall 2011	-40.168	29.118	-.080	-1.379	.168
	Percent of full-time first-time undergraduates receiving Pell grants, 2011-12	-75.801	27.780	-.213	-2.729	.007
	Percent Undergraduate Underrepresented Minorities	82.867	15.970	.342	5.189	.000
	Undergraduate Enrollment, Age 25 and Over, Percent, Fall 2011	52.425	33.651	.098	1.558	.120
	Unduplicated Graduate Headcount Percent, 2011-12	42.606	29.575	.073	1.441	.150
	CIP-6 Undergraduate Programs with Completers (Not by level), 2011-12	23.648	14.452	.108	1.636	.102

CIP-6 Graduate Programs with Completers (Not by level), 2011-12	7.525	18.652	.043	.403	.687
Research per Full-Time Faculty	-.005	.006	-.046	-.865	.387
Institution grants a medical degree	3560.814	851.620	.207	4.181	.000
Land Grant Institution	-1903.532	748.037	-.104	-2.545	.011
Percent Full-Time Faculty	97.749	18.940	.241	5.161	.000
Faculty as a percent of all employees	105.729	31.616	.184	3.344	.001
Total Instructional Staff - Weighted monthly salary 2012-13	1.758	.223	.457	7.874	.000
Cost Adjusted Undergraduate Degrees per Undergraduate Degrees	5175.149	1607.309	.134	3.220	.001
Cost Adjusted Graduate Degrees per Graduate Degrees	-518.461	251.886	-.104	-2.058	.040
Benefits as a percent of total expenditures	345.191	58.484	.213	5.902	.000
Depreciation per FTE	.872	.269	.164	3.242	.001
Operation and maintenance as a percent of total expenditures	303.314	66.191	.171	4.582	.000

a. Dependent Variable: Education Related Expenditures per FTE

### Model 3: Dependent Variable = Instructional Expenditures per FTE

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.806 <sup>a</sup>	.649	.629	2138.945

a. Predictors: (Constant), OM\_Total\_Exp, Percent Part-Time Enrollment, Undergraduate Students, Fall 2011, Town, Rural, Benefits\_Total\_EXP, Masters, Percent Undergraduate Underrepresented Minorities , Unduplicated Graduate Headcount Percent, 2011-12, Suburb, Cost Adjusted Undergraduate Degrees per Undergraduate Degrees, Land Grant Institution, County Median Family Income, 2008-12 (In 2012 Dollars), Percent Full-Time Faculty, Depreciation per FTE, CIP-6 Undergraduate Programs with Completers (Not by level), 2011-12, Cost Adjusted Graduate Degrees per Graduate Degrees, Institution grants a medical degree, Research per Full-Time Faculty, ACT Composite 50th percentile (Weighted Average ACT Composite and SAT-to-ACT Conversion), PCT\_Faculty, Total Instructional Staff - Weighted monthly salary 2012-13, Undergraduate Enrollment, Age 25 and Over, Percent, Fall 2011, Bachelors Sector, Total Annual FTE, academic year 2011-12, Percent of full-time first-time undergraduates receiving Pell grants, 2011-12, CIP-6 Graduate Programs with Completers (Not by level), 2011-12

b. Dependent Variable: Instructional Expenditures per FTE

Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-19718.343	2750.447		-7.169	.000
	Masters	-116.386	357.996	-.017	-.325	.745
	Bachelors Sector	1235.208	567.862	.132	2.175	.030
	Suburb	-217.220	288.756	-.025	-.752	.452
	Town	153.318	280.488	.019	.547	.585
	Rural	-40.662	502.802	-.002	-.081	.936
	County Median Family Income, 2008-12 (In 2012 Dollars)	.017	.009	.071	1.817	.070
	Total Annual FTE, academic year 2011-12	-.051	.024	-.159	-2.181	.030
	ACT Composite 50th percentile (Weighted Average ACT Composite and SAT-to-ACT Conversion)	198.872	67.887	.159	2.929	.004
	Percent Part-Time Enrollment, Undergraduate Students, Fall 2011	-9.271	14.558	-.032	-.637	.525
	Percent of full-time first-time undergraduates receiving Pell grants, 2011-12	-11.283	13.889	-.055	-.812	.417
	Percent Undergraduate Underrepresented Minorities	28.320	7.984	.203	3.547	.000
	Undergraduate Enrollment, Age 25 and Over, Percent, Fall 2011	19.603	16.824	.064	1.165	.245
	Unduplicated Graduate Headcount Percent, 2011-12	31.331	14.786	.094	2.119	.035
	CIP-6 Undergraduate Programs with Completers (Not by level), 2011-12	10.787	7.225	.085	1.493	.136

CIP-6 Graduate Programs with Completers (Not by level), 2011-12	6.701	9.325	.067	.719	.473
Research per Full-Time Faculty	.003	.003	.053	1.167	.244
Institution grants a medical degree	2358.053	425.771	.237	5.538	.000
Land Grant Institution	-773.398	373.985	-.074	-2.068	.039
Percent Full-Time Faculty	58.332	9.469	.250	6.160	.000
Faculty as a percent of all employees	76.677	15.806	.231	4.851	.000
Total Instructional Staff - Weighted monthly salary 2012-13	.861	.112	.389	7.713	.000
Cost Adjusted Undergraduate Degrees per Undergraduate Degrees	1241.905	803.582	.056	1.545	.123
Cost Adjusted Graduate Degrees per Graduate Degrees	-176.671	125.932	-.061	-1.403	.161
Benefits as a percent of total expenditures	196.857	29.239	.210	6.733	.000
Depreciation per FTE	.700	.134	.229	5.210	.000
Operation and maintenance as a percent of total expenditures	41.910	33.092	.041	1.266	.206

a. Dependent Variable: Instructional Expenditures per FTE