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**Optimizing University Managed Resources
for South Dakota Public Universities:
A Simulation Approach**

Michael Holbeck and David L. Chicoine

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Optimizing University Managed Resources for South Dakota Public Universities

A Simulation Approach

Michael Holbeck and David L. Chicoine
South Dakota State University
November 25, 2011

Abstract: A simulation analysis demonstrates the use of tuition as a policy tool to achieve financial independence among the six South Dakota public universities under University Managed Resources (UMR). The simulation analysis maintains an overall environment of funding stability and is guided by horizontal equity, a concept from the economics of public finance that all entities of the same or similar situation are treated similarly. Financial independence, within the simulation analysis, is defined as an annual budgeting process with no reallocation of financial resources among or between the six universities. For each of the three indicators of horizontal equity simulated, achieving financial independence also realized a convergence of base funding per state-support-tuition student full-time-equivalents (FTE) among the six universities. Applying the economics of public finance concept vertical equity, as a guide to provide rationale for, and explanations of, variation in base funding per state-support-tuition student full-time-equivalent (FTE) among the six public universities, would be a worthwhile follow-up study.

Optimizing University Managed Resources for South Dakota Public Universities: A Simulation Approach*

Base funds for South Dakota's six public universities for the purposes of this examination are defined as:

- general funds from the State of South Dakota appropriated to the South Dakota Board of Regents, including federal stimulus funds (American Recovery & Reinvestment Act (ARRA));
- state-support tuition, both for residents and non-residents; and
- salary competitiveness fee (SCF) revenues.

These are the fund sources that defined university base funding for the implementation of University Managed Resources (UMR) in FY11 and for accommodating the 10.0 percent cut in state appropriated general funds in FY12.

Generally, non-resident student tuition at South Dakota's public universities is 150 percent of resident state-support tuition charged students who are legal residents of South Dakota. Theoretically, resident tuition is less than non-resident tuition at public universities because state general funds lower the price (i.e. tuition) charged residents versus the price charged non-residents. State general funds cover a part of the cost of higher education services for students from South Dakota, and resident tuition and mandatory fees fund the remaining cost. The difference between resident tuition and non-resident tuition, in equilibrium under a cost-based tuition model, is the state funds supporting each resident student.

It can be argued, as well, that state funding for resident students reflects the value of the public good dimension of higher education service to the State of South Dakota as determined by state policymakers through the annual state budget process. The state budget process sets the level of state general funds appropriated for public higher education and thus determines the value of the public good dimension of higher education to the state through the lens of elected state government policymakers. By deduction, tuition and fees charged South Dakota residents, then, are the value of the private good dimension of higher education, again, as determined by elected state policymakers via the state budget process.

Prior to FY11, state-support tuition and salary competitiveness fee revenues were remitted to a pool held by the South Dakota Board of Regents. By Board of Regents policy, revenues were allocated back to each of the respective six universities based on:

1. inflation adjustments for operating expenses;
2. salary increases (i.e. salary policy) and benefits;
3. an adjustment for enrollment, lagged a year;
4. salary competitiveness fee revenues;
5. adjustments in tuition related to PhD and other special programs;
6. graduate assistant tuition reimbursements; and
7. realignments that may be necessary to accommodate year-over-year reductions in state general funds appropriations.

Tuition revenues remitted back to the respective universities were based on in-state resident rates with the margin charged non-residents held centrally.

University Managed Resources.

In June, 2010, the Board of Regents approved UMR effective with FY11 (July 1, 2010) as the policy for tuition funding of the six universities. The principle of UMR is that each university retains revenues collected from tuition and SCF paid by students attending that university. Thus, for FY11 each university was allocated only the tuition and SCF revenues paid by students attending that university, including resident and non-resident tuition revenues. Under UMR, compared to the central pooling and redistribution policy:

1. the complex computations required to allocate the tuition and SCF revenues to universities is avoided;
2. universities receive tuition revenues, paid by residents at the resident rate and paid by non-residents at the non-resident rate, in the year paid;
3. there is a clear, simple, transparent linkage between students enrolled and base funds from tuition and SCF revenues available to fund each university's operations;
4. universities have a direct financial incentive to recruit both resident and non-resident students;
5. universities have a direct incentive to minimize accounts receivable; and
6. universities have a direct incentive to maximize efficiencies, i.e. provide high-quality programs at the lowest cost (an incentive to minimize costs, *certeris paribus*).

Principle attributes of UMR include equality of opportunity, given the respective missions and market positions of each university, and financial independence from each other. The principle of financial independence means there are no base funds reallocated between any of the six universities in any budget year. Each of South Dakota's public universities is operated as an independent financial unit under the authority of the Board of Regents.

Performance, as measured by resident and non-resident student enrollment, is directly and transparently aligned with base funding revenues from resident and non-resident state-support tuition students. Financial independence provides a strong direct incentive to minimize costs and be as efficient as possible. Each university has a direct incentive to aggressively pursue least cost methods to deliver the highest quality higher education services possible, *certeris paribus*.

To comply with the UMR principle that each university retain the tuition and SCF revenues collected from its students and to assure no university experienced a loss of base funds with UMR, implementation of UMR in FY11 required the reallocation of general funds among the universities. To assure no university experienced a loss of base funds with the implementation of UMR, the principle of financial independence was waived and thus all of the benefits associated with UMR not captured.

In FY11 state general funds were reallocated from South Dakota State University (SDSU) and the University of South Dakota (USD) to the four universities with "own" tuition and SCF

revenues less than the revenues from these sources historically provided from the pool allocation. This adjustment appears in the General Funds Adjustment row in Table 1, *FY11 Funding*.

	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
FY11 General Funds	\$ 7,429,897	\$ 7,360,168	\$ 10,891,712	\$ 13,431,972	\$ 40,987,704	\$ 30,406,133	\$ 110,507,586
ARRA	\$ 615,280	\$ 605,485	\$ 747,103	\$ 1,240,090	\$ 3,792,213	\$ 2,737,138	\$ 9,737,309
General Funds Adjustment	\$ 270,077	\$ 838,530	\$ 464,724	\$ 244,797	\$ (1,778,573)	\$ (39,558)	\$ (0)
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
Base Tuition	\$ 5,786,516	\$ 2,708,831	\$ 4,075,814	\$ 5,129,886	\$ 24,941,231	\$ 13,998,763	\$ 56,641,041
Base Funding	\$ 16,169,035	\$ 12,503,436	\$ 17,682,604	\$ 21,818,458	\$ 76,531,697	\$ 52,294,688	\$ 196,999,918
Univ. Gen. Funds as % of Univ. Base Funding	51.4%	70.4%	68.4%	68.4%	56.2%	63.3%	61.0%
Univ. Base Funding as % of Total Base Funding	8.2%	6.3%	9.0%	11.1%	38.8%	26.5%	100.0%
FY11 Funding: Consolidated							
	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds	\$ 8,315,255	\$ 8,804,184	\$ 12,103,539	\$ 14,916,860	\$ 43,001,344	\$ 33,103,713	\$ 120,244,895
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
Base Tuition	\$ 5,786,516	\$ 2,708,831	\$ 4,075,814	\$ 5,129,886	\$ 24,941,231	\$ 13,998,763	\$ 56,641,041
Base Funding	\$ 16,169,035	\$ 12,503,436	\$ 17,682,604	\$ 21,818,458	\$ 76,531,697	\$ 52,294,688	\$ 196,999,918
Per student FTE Resources							
Fall 2010 <u>Resident State-Support Student FTE</u>	1,662	832	1,141	1,088	6,017	3,716	14,456
FY11 General funds per Resident State-Support Student FTE	\$ 5,002	\$ 10,588	\$ 10,604	\$ 13,707	\$ 7,147	\$ 8,909	\$ 8,318
Fall 2010 <u>State-Support Student FTE</u>	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY11 Base Funding per State-Support Student FTE	\$ 7,431	\$ 11,398	\$ 10,519	\$ 11,087	\$ 8,243	\$ 9,585	\$ 9,094

Specifically, \$1,778,573 and \$39,558 in general funds from SDSU and USD, respectively, were reallocated to the other four universities. The amount provided to each of the four universities appears in the columns of the respective universities in Table 1 in the General Funds Adjustment row. The Sanford/USD School of Medicine data were not included in Table 1 or in subsequent tables or analyses.

Shown in the lower part of Table 1, are fall 2010 state-support tuition student full-time-equivalents (FTEs) and FY11 base funding per student FTE.¹ Undergraduate state-support tuition student FTEs are calculated by dividing the number of undergraduate credit hours taken by resident and non-resident undergraduates by 15. Graduate state-support tuition student FTEs are calculated by dividing the number of graduate credit hours by 12.² Law student FTEs at USD are calculated using 15 credit hours as the denominator.

The fall 2010 state-support tuition student FTE count for the system is 21,663. State-support student FTEs varied from a low of 1,097 at Dakota State University (DSU) to a high of 9,285 at SDSU. The FY11 base funding per state-support student FTE varied, as well, among the six universities from a high of \$11,398 at DSU to a low of \$7,431 at Black Hills State University (BHSU). Recall ARRA funds (federal stimulus funds) are defined as state general funds. BHSU's base funding per student FTE is 65.2 percent of the base funding per student FTE for

DSU. The student weighted mean base funding per state-support student FTE for the system, as shown in Table 1, is \$9,094.

Also in the lower section of Table 1 are fall 2010 South Dakota resident state-support tuition student full-time-equivalents (FTEs) in total and for each of the six universities and the ratio of FY11 general funds to resident state-support student FTEs.³ State general funds per resident state-support student FTE varied from \$13,707 at South Dakota School of Mines and Technology (SDSMT) to \$5,002 at BHSU with a student weighted mean of \$8,318 per resident state-support student FTE across the six universities.

Table 2 presents *FY12 Base Funding- Estimated* for each university and for the university system. These estimates assume total credit hours generated, as well as number of undergraduate and graduate credit hours generated, and the proportion of resident and non-resident students are constant at fall, 2010 (or FY11) levels.

	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
FY11 General Funds	\$ 7,699,975	\$ 8,198,699	\$ 11,356,436	\$ 13,676,770	\$ 39,209,131	\$ 30,366,575	\$ 110,507,586
ARRA	\$ 615,280	\$ 605,485	\$ 747,103	\$ 1,240,090	\$ 3,792,213	\$ 2,737,138	\$ 9,737,309
General Funds Gen. Bill Cut	\$ (1,096,988)	\$ (826,936)	\$ (1,190,223)	\$ (1,413,752)	\$ (4,931,137)	\$ (3,408,413)	\$ (12,867,449)
Gen. Funds Adjustment*	\$ (124,060)	\$ 120,530	\$ 161,272	\$ 83,637	\$ (581,985)	\$ 297,559	\$ (43,047)
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
Base Tuition	\$ 5,786,516	\$ 2,708,831	\$ 4,075,814	\$ 5,129,886	\$ 24,941,231	\$ 13,998,763	\$ 56,641,041
FY12 Earned Tuition Increase	\$ 839,045	\$ 392,780	\$ 590,993	\$ 743,833	\$ 3,616,478	\$ 2,029,821	\$ 8,212,951
Base Funding	\$ 15,787,032	\$ 12,189,810	\$ 17,244,646	\$ 21,232,176	\$ 74,635,053	\$ 51,213,655	\$ 192,302,373
Univ. Gen. Funds as % of Univ. Base Funding	44.9%	66.4%	64.2%	64.0%	50.2%	58.6%	55.8%
Univ. Base Funding as % of Total Base Funding	8.2%	6.3%	9.0%	11.0%	38.8%	26.6%	100.0%
FY12 Base Funding Estimated: Consolidated							
	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds	\$ 7,094,207	\$ 8,097,778	\$ 11,074,588	\$ 13,586,745	\$ 37,488,222	\$ 29,992,859	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
Base Funding	\$ 15,787,032	\$ 12,189,810	\$ 17,244,646	\$ 21,232,176	\$ 74,635,053	\$ 51,213,655	\$ 192,302,373
Univ. Gen. Funds as % of Univ. Base Funding	44.9%	66.4%	64.2%	64.0%	50.2%	58.6%	55.8%
Univ. Base Funding as % of Total Base Funding	8.2%	6.3%	9.0%	11.0%	38.8%	26.6%	100.0%
Per Student FTE Resources							
Fall 2010 <u>Resident</u> State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY12 General funds per Resident State-Support Student FTE	\$ 4,267	\$ 9,738	\$ 9,703	\$ 12,484	\$ 6,231	\$ 8,072	\$ 7,425
Fall 2010 <u>State-Support</u> Student FTE	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877

*Sanford/USD School of Medicine received \$43,047 in the FY12 General Funds Adjustment balancing the general funds reallocated at zero for the system.

Table 2 includes details on each university's FY12 base funding and for the sum of the six universities. The calculations begin with:

- FY11 General Funds in row 1,
- row 2 is ARRA funds,
- row 3 is the General Funds cut accommodating reduced FY12 state appropriations,

- row 4 is the General Funds Adjustment to proportion the base funding reduction driven by the 10.0 percent cut in state appropriations among the universities,
- row 5 is SCF revenues,
- row 6 is base tuition each university earned under UMR (note this is carried forward from Table 1, *FY11 Funding*, Base Tuition row),
- row 7 is the forecasted increment in tuition earned by each university in FY12 because of the 14.5 percent increase in tuition FY11 to FY12, and
- row 8 is the estimated base funding.

State general funds were reallocated from BHSU and SDSU to the other four universities, waiving the financial independence principle of UMR. The Sanford/USD School of Medicine received \$43,047 in reallocated state general funds in FY12, balancing the general funds reallocated at zero for the system. This adjustment was necessary to equitably proportion among the universities the 10.0 percent cut in General Funds, FY11 to FY12, because of the variation among the universities in the percentage of general funds that comprise the respective FY11 base funding (see Table 1, Univ. Gen. Funds as % of Univ. Base Funding row). For FY12 general funds comprise an estimated 55.8 percent of the total base funding of the university system. After the reallocation of general funds, the percent of general funds in the respective universities' base funding ranges from 66.4 percent for DSU to 44.9 percent for BHSU.

Also shown in Table 2 is the percent of the total base funding represented by each university's base funding. For example, BHSU's base funding was 8.2 percent of the total base funding in the system while SDSU's was 38.8 percent. In this year BHSU served 10.0 percent of student FTEs in the six universities and SDSU served 42.9 percent. These ratios are calculated from the data in Table 2, Fall 2010 State-Support Student FTE row. For BHSU the ratio is 2,176 divided by 21,633 times 100 = 10.0 percent. DSU's base funding was 6.3 percent of the total base funding and DSU served 5.1 percent of student FTEs in the six universities.

In the lower portion of Table 2, as in Table 1, are estimates of FY12 base funding per state-support tuition student FTE. The average is \$8,877 per student FTE for the university system. The range is from a high of \$11,112 at DSU to a low of \$7,255 at BHSU. Per student FTE base funding support in rank order, highest to lowest, is \$11,112 at DSU, \$10,789 at SDSMT, \$10,259 at Northern State University (NSU), \$9,387 at USD, \$8,038 at SDSU and \$7,255 at BHSU.

Horizontal and Vertical Equity.

To capture the full benefit of UMR, the principle of financial independence must be enabled, establishing an annual funding process with no reallocations of financial resources, whether general funds, tuition revenues or SCF revenues, among the universities. All things considered, policies enabling financial independence should assure, at a minimum, a constant real base funding for each university during the transition and allow each university to pursue and capture the benefits of both enrollment growth and efficiency gains (cost minimization, *certeris paribus*).

Approaches to enabling financial independence can be guided by the principle of equity from the economics of public finance (Musgraves 1959, p. 160). Equity is the concept or idea of fairness.

Two principle types of equity guide the economics of public finance – horizontal equity and vertical equity.

Horizontal equity is the concept or idea that all entities (individuals, organizations, businesses, etc.) in the same or similar situation are treated similarly. For example, horizontal equity is achieved in individual income tax policy when individuals of the same economic capacity (i.e. ability to pay measured by income per year) pay the same percentage of their income in taxes per year. For the sales tax, horizontal equity guides the application of the same sales tax rate to all retail sales subject to sales taxation. For the sales tax, the value of the purchase is the “same situation.” Horizontal equity guides state school-aid formulas that distribute state-aid to equalize a minimum level of funding per student from local property taxes plus state-aid independent of the school district where a student lives. Here the entity in a “similar situation” is the student.

Vertical equity is the concept or idea that dissimilar or different entities can be treated differently, but treatment is justified and can be explained. The graduated progressive federal individual income tax is a common illustration of vertical equity in tax policy. Higher income individuals are judged to have a higher ability-to-pay and thus pay a higher income tax rate than is paid by lower income individuals, judged to have a lower ability-to-pay. In South Dakota the lower property tax mill levy applied to agricultural real estate compared to the mill levy on other commercial real estate is guided by vertical equity. Agricultural property is judged by the public policy process to be different for property tax purposes and thus a lower mill levy is used to compute property taxes.

In higher education, discipline fees or tuition surcharges for high cost fields of study such as pharmacy, engineering, nursing and business are guided by vertical equity. Students in high cost majors are charged an additional fee not charged students in lower-cost fields of study such as English, history, social sciences, journalism and literature. Revenue from the fees covers the higher costs. Also, in most states in the U.S., resident tuition at flagship public and land-grant research/teaching universities is typically higher than resident tuition at bachelor/master’s teaching public universities. Vertical equity guides the tuition policies in the respective states.

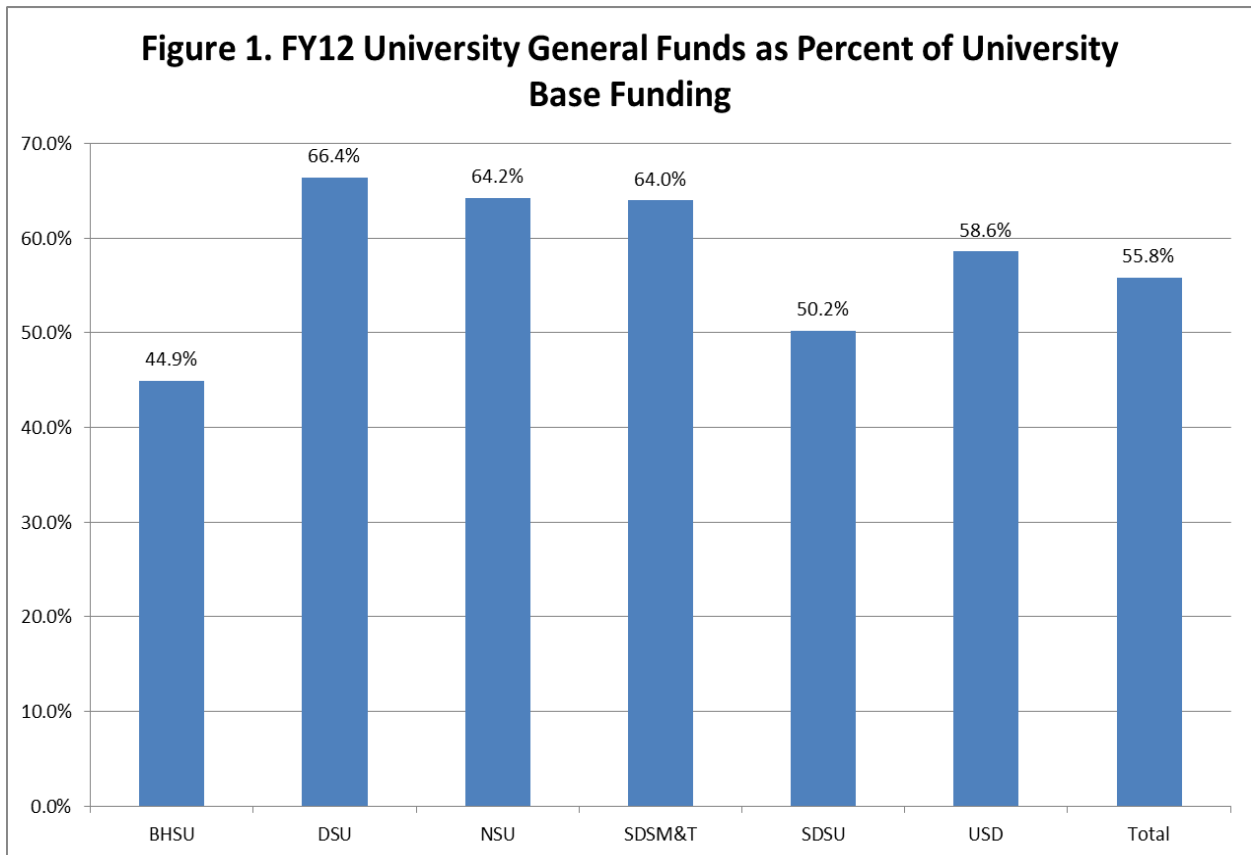
Achieving Financial Independence: Three Simulations Under Three Indicators of Horizontal Equity.

For the purposes of enabling financial independence within UMR, three indicators of horizontal equity are analyzed:

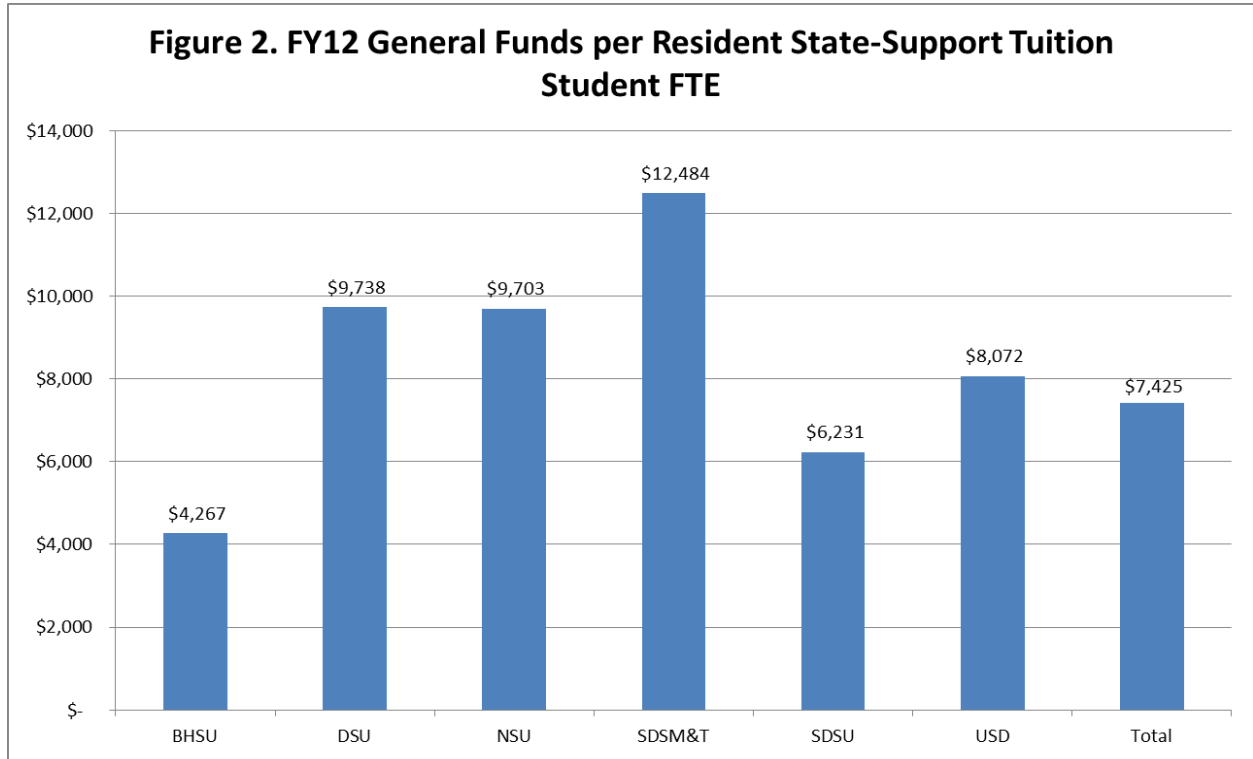
1. general funds as a percent of base funding;
2. general funds per resident state-support tuition student FTE; and
3. base funding per state-support tuition student FTE.

The first indicator of horizontal equity, general funds as a percent of base funding, treats each university as being in a “similar condition.” Figure 1 presents general funds as a percent of base

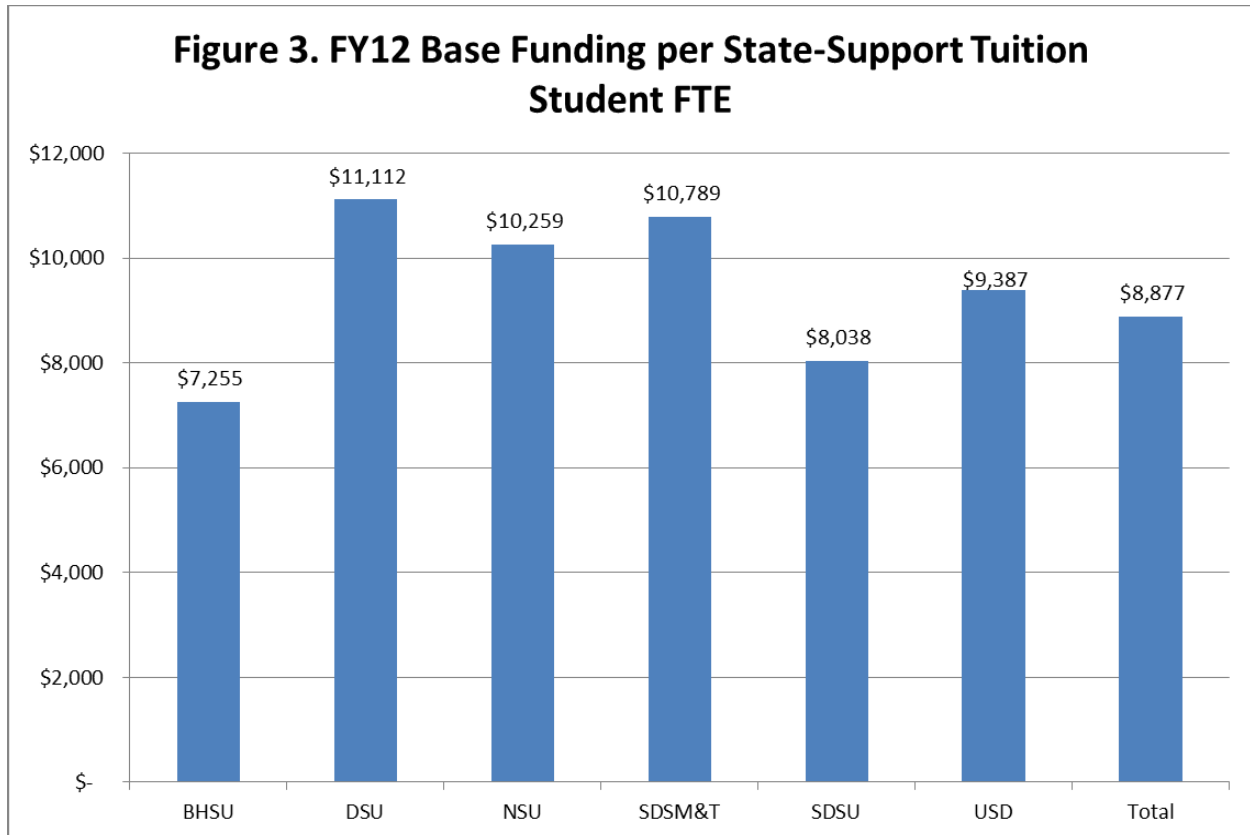
funding for FY12. These data are found in Table 2 in the Univ. Gen. Funds as % of Univ. Base Funding row.



The second indicator of horizontal equity treats each South Dakota resident student FTE as being in a “similar condition.” Figure 2 presents general funds per resident state-support tuition student FTE. These data are found in Table 2 in the FY12 General funds per Resident State-Support Student FTE row.



The third indicator of horizontal equity treats each student FTE as being in a “similar condition.” Figure 3 presents base funding per state-support tuition student FTE for FY12. These data are found in Table 2 in the FY12 Base Funding per State-Support Student FTE row.



For each indicator of horizontal equity the baseline for the analysis adjusts the FY12 base funding to achieve the indicator. For example, each university’s base funding was adjusted to include 55.8 percent state general funds for the first indicator of horizontal equity. Tuition revenues are reallocated to maintain each university’s FY12 base funding (shown in the Adjustment row in all tables).

To achieve financial independence a simulation is performed using a 14.0 percent annual increase in tuition, all other things held constant. The 14.0 percent annual tuition increase used for the simulations was guided by the FY12 tuition and mandatory fee policy of the Board of Regents. Within the 6.9 percent increase in tuition and mandatory fees for FY12, the tuition increase was 14.5 percent and the mandatory fees increase ranged between 0.2 percent and 0.3 percent among the six universities, yielding the 6.9 percent composite increase. This approach, over time, will establish a balance between tuition and mandatory fees in South Dakota that is more reflective of the balance for public universities, nationally. Typically the balance is 75–85 percent tuition with the remainder being mandatory fees. The balance between tuition and mandatory fees in South Dakota is close to 50 percent for each.

General funds are held constant in the simulations. While achieving financial independence is feasible through an increase in appropriated state general funds, such an increase was judged not probable. Enrollments (measured by state support tuition student FTEs) are held constant, also. Enrollment growth would achieve a state of financial independence in a shorter timeframe. However, to assure a clear incentive for enrollment growth, revenues associated with growth should be retained by each university. Thus, enrollments are held constant at the fall 2010 (FY11) levels.

Horizontal Equity Indicator One: Base Funding with Equal Percent (55.8%) General Funds.

In FY12 state general funds comprised 55.8 percent of the base funding for the universities combined (see Table 2 and Figure 1). The variation among the universities ranged from a low of 44.9 percent for BHSU to a high of 66.4 percent for DSU. Table 3 presents the FY12 base funding with general funds reallocated among the universities so each university's general funds are 55.8 percent of their FY12 base funding. The Base Funding Adjusted row in Table 3 for each university includes the adjustment of tuition revenues from BHSU and SDSU to the other four universities to hold each university's FY12 base funding constant at the FY12 level.

	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
FY12 General Funds (Before Adjustment)	\$ 7,094,207	\$ 8,097,778	\$ 11,074,588	\$ 13,586,745	\$ 37,488,222	\$ 29,992,859	\$ 107,334,399
General Funds Adjustment	\$ 1,717,393	\$ (1,293,983)	\$ (1,449,414)	\$ (1,735,914)	\$ 4,169,655	\$ (1,407,737)	\$ 0
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
FY12 Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
Base Funding	\$ 17,504,425	\$ 10,895,828	\$ 15,795,232	\$ 19,496,262	\$ 78,804,709	\$ 49,805,918	\$ 192,302,373
Adjustment	\$ (1,717,393)	\$ 1,293,983	\$ 1,449,414	\$ 1,735,914	\$ (4,169,655)	\$ 1,407,737	\$ (0)
Base Funding Adjusted	\$ 15,787,032	\$ 12,189,810	\$ 17,244,646	\$ 21,232,176	\$ 74,635,053	\$ 51,213,655	\$ 192,302,373
FY12 Base Funding with General Funds at 55.8%: Consolidated							
	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds(as 55.8% of Univ. Base)	\$ 8,811,600	\$ 6,803,795	\$ 9,625,174	\$ 11,850,831	\$ 41,657,877	\$ 28,585,122	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
Tuition	\$ 4,908,168	\$ 4,395,594	\$ 6,116,221	\$ 7,609,634	\$ 24,388,054	\$ 17,436,320	\$ 64,853,992
Base Funding Adjusted	\$ 15,787,032	\$ 12,189,810	\$ 17,244,646	\$ 21,232,176	\$ 74,635,053	\$ 51,213,655	\$ 192,302,373
Univ. Gen. Funds as % of Univ. Base Funding	55.8%	55.8%	55.8%	55.8%	55.8%	55.8%	55.8%
Univ. Base Funding as % of Total Base Funding	8.2%	6.3%	9.0%	11.0%	38.8%	26.6%	100.0%
Per Student FTE Resources							
Fall 2010 <u>Resident</u> State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY12 General funds per Resident State-Support Student FTE	\$ 5,300	\$ 8,182	\$ 8,433	\$ 10,889	\$ 6,924	\$ 7,693	\$ 7,425
Fall 2010 <u>State-Support</u> Student FTE	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877

To achieve financial independence while assuring funding stability and no reduction in real base funding for any university, the simulations of the annual 14.0 percent tuition increase applied the revenues from 11 percentage points of the growth in tuition for each university receiving an

adjustment to reducing the adjustment. Revenues from three percentage points of the growth in the tuition for these receiving universities are added to their respective base funding. For each year of the simulation, BHSU and SDSU retain all revenues from the 14.0 percent tuition increase and have tuition funded adjustments provided the other four universities reduced by the revenues from the 11 percentage points of growth in tuition at each of the respective universities. Upon achieving financial independence, universities retain all revenues from the 14.0 percent tuition increase. Keep in mind, the simulations hold all variables constant and increase tuition 14.0 percent annually.

Tables 4 through 7 are the annual simulations for FY13 through FY16. In FY16 financial independence is achieved and adjustments of tuition revenues from BHSU and SDSU to any university no longer occur (see Table 7, Adjustment row).

**Table 4 - FY13 Base Funding: Equal Percentage of General Funds Simulation
(14% FY13 Tuition Increase with 11% of 14% Off-Setting FY12 Adjustments)**

	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds	\$ 8,811,600	\$ 6,803,795	\$ 9,625,174	\$ 11,850,831	\$ 41,657,877	\$ 28,585,122	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
FY12 Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
FY13 Earned Tuition Increase	\$ 927,579	\$ 434,226	\$ 653,353	\$ 822,321	\$ 3,998,079	\$ 2,244,002	\$ 9,079,559
Base Funding	\$ 18,432,003	\$ 11,330,053	\$ 16,448,585	\$ 20,318,583	\$ 82,802,788	\$ 52,049,920	\$ 201,381,932
Adjustment	\$ (868,951)	\$ 952,805	\$ 936,066	\$ 1,089,805	\$ (2,109,725)	0	\$ (0)
Base Funding Adjusted	\$ 17,563,052	\$ 12,282,859	\$ 17,384,650	\$ 21,408,388	\$ 80,693,063	\$ 52,049,920	\$ 201,381,932
Univ. Gen. Funds as % of Univ. Base Funding	50.2%	55.4%	55.4%	55.4%	51.6%	54.9%	53.3%
Univ. Base Funding as % of Total Base Funding	8.7%	6.1%	8.6%	10.6%	40.1%	25.8%	100.0%
Per Student FTE Resources							
Fall 2010 <u>Resident</u> State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY13 General funds per Resident State-Support Student FTE	\$ 5,300	\$ 8,182	\$ 8,433	\$ 10,889	\$ 6,924	\$ 7,693	\$ 7,425
Fall 2010 <u>State-Support</u> Student FTE	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877
FY13 Base Funding per State-Support Student FTE	\$ 8,071	\$ 11,197	\$ 10,342	\$ 10,878	\$ 8,691	\$ 9,540	\$ 9,296

**Table 5 - FY14 Base Funding: Equal Percentage of General Funds Simulation
(14% FY14 Tuition Increase with 11% of 14% Off-Setting FY13 Adjustments)**

	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds	\$ 8,811,600	\$ 6,803,795	\$ 9,625,174	\$ 11,850,831	\$ 41,657,877	\$ 28,585,122	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
FY12 Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
FY13 Earned Tuition Increase	\$ 927,579	\$ 434,226	\$ 653,353	\$ 822,321	\$ 3,998,079	\$ 2,244,002	\$ 9,079,559
FY14 Earned Tuition Increase	\$ 1,057,440	\$ 495,017	\$ 744,822	\$ 937,446	\$ 4,557,810	\$ 2,558,162	\$ 10,350,697
Base Funding	\$ 19,489,443	\$ 11,825,071	\$ 17,193,407	\$ 21,256,029	\$ 87,360,598	\$ 54,608,082	\$ 211,732,629
Adjustment	\$ (369,892)	\$ 563,863	\$ 350,848	\$ 353,241	\$ (898,060)	0	\$ (0)
Base Funding Adjusted	\$ 19,119,551	\$ 12,388,934	\$ 17,544,255	\$ 21,609,269	\$ 86,462,538	\$ 54,608,082	\$ 211,732,629
Univ. Gen. Funds as % of Univ. Base Funding	46.1%	54.9%	54.9%	54.8%	48.2%	52.3%	50.7%
Univ. Base Funding as % of Total Base Funding	9.0%	5.9%	8.3%	10.2%	40.8%	25.8%	100.0%
Per Student FTE Resources							
Fall 2010 <u>Resident</u> State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY14 General funds per Resident State-Support Student FTE	\$ 5,300	\$ 8,182	\$ 8,433	\$ 10,889	\$ 6,924	\$ 7,693	\$ 7,425
Fall 2010 <u>State-Support</u> Student FTE	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877
FY13 Base Funding per State-Support Student FTE	\$ 8,071	\$ 11,197	\$ 10,342	\$ 10,878	\$ 8,691	\$ 9,540	\$ 9,296
FY14 Base Funding per State-Support Student FTE	\$ 8,787	\$ 11,293	\$ 10,437	\$ 10,980	\$ 9,312	\$ 10,009	\$ 9,774

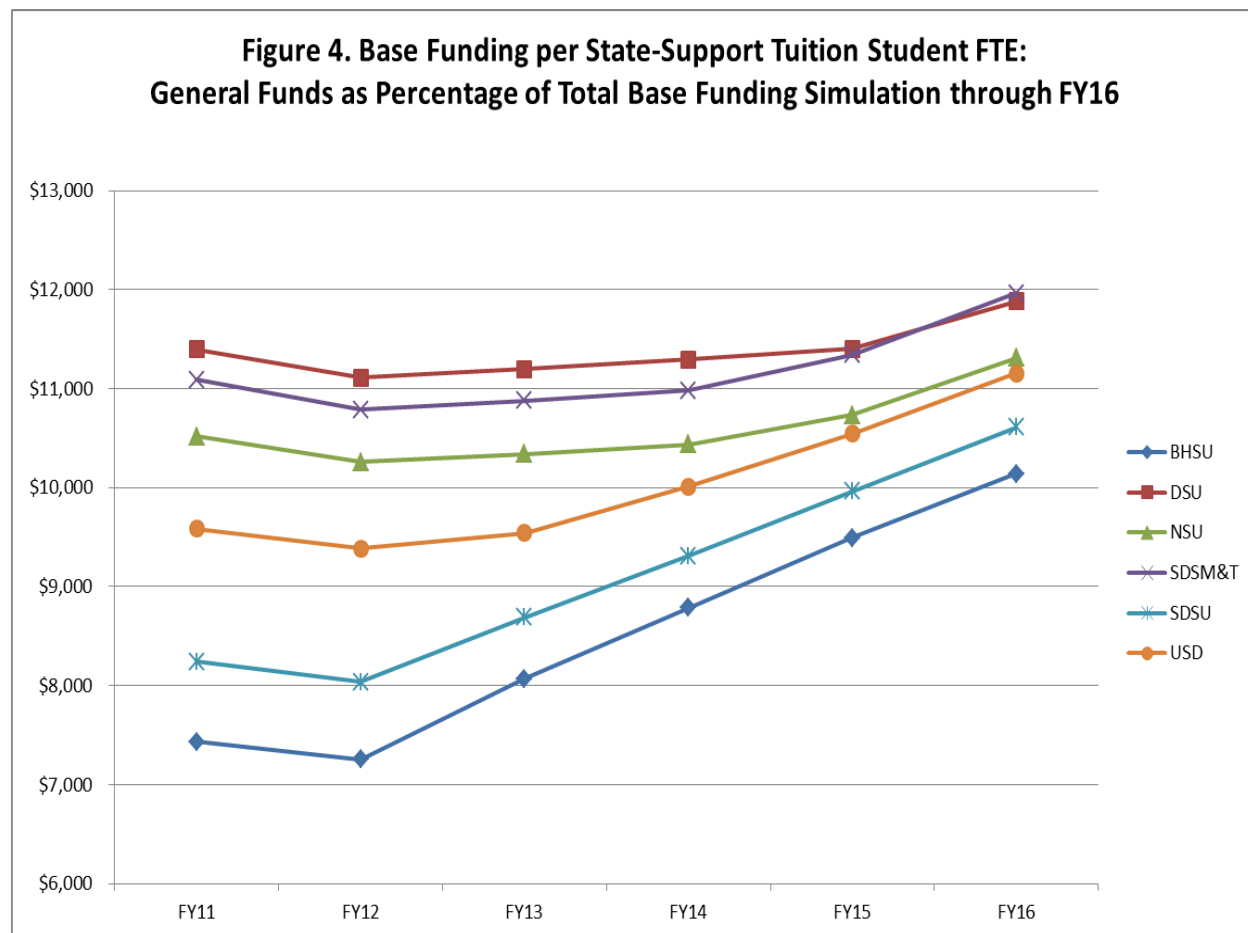
Table 6 - FY15 Base Funding: Equal Percentage of General Funds Simulation							
(14% FY15 Tuition Increase with 11% of 14% Off-Setting FY14 Adjustments)							
	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds	\$ 8,811,600	\$ 6,803,795	\$ 9,625,174	\$ 11,850,831	\$ 41,657,877	\$ 28,585,122	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
FY12 Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
FY13 Earned Tuition Increase	\$ 927,579	\$ 434,226	\$ 653,353	\$ 822,321	\$ 3,998,079	\$ 2,244,002	\$ 9,079,559
FY14 Earned Tuition Increase	\$ 1,057,440	\$ 495,017	\$ 744,822	\$ 937,446	\$ 4,557,810	\$ 2,558,162	\$ 10,350,697
FY15 Earned Tuition Increase	\$ 1,205,481	\$ 564,320	\$ 849,098	\$ 1,068,688	\$ 5,195,904	\$ 2,916,305	\$ 11,799,795
Base Funding	\$ 20,694,924	\$ 12,389,390	\$ 18,042,505	\$ 22,324,717	\$ 92,556,502	\$ 57,524,386	\$ 223,532,424
Adjustment	\$ (35,144)	\$ 120,469	0	0	\$ (85,326)	0	(0)
Base Funding Adjusted	\$ 20,659,780	\$ 12,509,860	\$ 18,042,505	\$ 22,324,717	\$ 92,471,177	\$ 57,524,386	\$ 223,532,424
Univ. Gen. Funds as % of Univ. Base Funding	42.7%	54.4%	53.3%	53.1%	45.0%	49.7%	48.0%
Univ. Base Funding as % of Total Base Funding	9.2%	5.6%	8.1%	10.0%	41.4%	25.7%	100.0%
Per Student FTE Resources							
Fall 2010 <u>Resident</u> State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY15 General funds per Resident State-Support Student FTE	\$ 5,300	\$ 8,182	\$ 8,433	\$ 10,889	\$ 6,924	\$ 7,693	\$ 7,425
Fall 2010 <u>State-Support</u> Student FTE	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877
FY13 Base Funding per State-Support Student FTE	\$ 8,071	\$ 11,197	\$ 10,342	\$ 10,878	\$ 8,691	\$ 9,540	\$ 9,296
FY14 Base Funding per State-Support Student FTE	\$ 8,787	\$ 11,293	\$ 10,437	\$ 10,980	\$ 9,312	\$ 10,009	\$ 9,774
FY15 Base Funding per State-Support Student FTE	\$ 9,494	\$ 11,404	\$ 10,733	\$ 11,344	\$ 9,959	\$ 10,543	\$ 10,319

Table 7 - FY16 Base Funding: Equal Percentage of General Funds Simulation							
(14% FY16 Tuition Increase with 11% of 14% Off-Setting FY15 Adjustments)							
	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds	\$ 8,811,600	\$ 6,803,795	\$ 9,625,174	\$ 11,850,831	\$ 41,657,877	\$ 28,585,122	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
FY12 Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
FY13 Earned Tuition Increase	\$ 927,579	\$ 434,226	\$ 653,353	\$ 822,321	\$ 3,998,079	\$ 2,244,002	\$ 9,079,559
FY14 Earned Tuition Increase	\$ 1,057,440	\$ 495,017	\$ 744,822	\$ 937,446	\$ 4,557,810	\$ 2,558,162	\$ 10,350,697
FY15 Earned Tuition Increase	\$ 1,205,481	\$ 564,320	\$ 849,098	\$ 1,068,688	\$ 5,195,904	\$ 2,916,305	\$ 11,799,795
FY16 Earned Tuition Increase	\$ 1,374,248	\$ 643,324	\$ 967,971	\$ 1,218,304	\$ 5,923,300	\$ 3,324,587	\$ 13,451,766
Adjustment	0	0	0	0	0	0	0
Base Funding	\$ 22,069,172	\$ 13,032,715	\$ 19,010,476	\$ 23,543,021	\$ 98,479,833	\$ 60,848,973	\$ 236,984,190
Univ. Gen. Funds as % of Univ. Base Funding	39.9%	52.2%	50.6%	50.3%	42.3%	47.0%	45.3%
Univ. Base Funding as % of Total Base Funding	9.3%	5.5%	8.0%	9.9%	41.6%	25.7%	100.0%
Per Student FTE Resources							
Fall 2010 <u>Resident</u> State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY16 General funds per Resident State-Support Student FTE	\$ 5,300	\$ 8,182	\$ 8,433	\$ 10,889	\$ 6,924	\$ 7,693	\$ 7,425
Fall 2010 <u>State-Support</u> Student FTE	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877
FY13 Base Funding per State-Support Student FTE	\$ 8,071	\$ 11,197	\$ 10,342	\$ 10,878	\$ 8,691	\$ 9,540	\$ 9,296
FY14 Base Funding per State-Support Student FTE	\$ 8,787	\$ 11,293	\$ 10,437	\$ 10,980	\$ 9,312	\$ 10,009	\$ 9,774
FY15 Base Funding per State-Support Student FTE	\$ 9,494	\$ 11,404	\$ 10,733	\$ 11,344	\$ 9,959	\$ 10,543	\$ 10,319
FY16 Base Funding per State-Support Student FTE	\$ 10,142	\$ 11,880	\$ 11,309	\$ 11,963	\$ 10,606	\$ 11,153	\$ 10,940

In FY13 USD achieves financial independence noted by a zero in the USD column for the Adjustment row in Table 4. In FY15, as presented in Table 6, NSU and SDSMT achieve financial independence. In FY15 DSU receives an adjustment of \$120,469 from BHSU and SDSU and realizes financial independence in FY16, as shown in Table 7.

Shown in the lower part of Tables 4 through 7 are base funding per state-support student FTE for each university, year by year through the simulation period. Thus, Table 7 has these ratios for each year of the simulation, FY13 through FY16 (four fiscal years) as well as the baseline, FY12

and for FY11. All universities experienced base funding growth over the simulation period and thus a growth in base funding per state-support tuition student FTE, under the assumption of constant enrollment and 14.0 percent annual tuition increases (see Figure 4).



For example, DSU per student FTE base funding increased from \$11,112 in FY12 to \$11,880 in FY16 in this simulation. The comparable figures for BHSU are \$7,255 and \$10,142. The difference in student FTE base funding comparing the highest with the lowest decreases from \$3,857 (DSU vs BHSU) to \$1,821 (SDSMT vs BHSU) between FY12 and FY16. The simulated weighted mean base funding per student FTE in FY16 is \$10,940 for the system (see Table 7).

Under the assumption of constant enrollment and student mix, in FY16, the first year all universities are financially independent under this indicator of horizontal equity, BHSU has 9.3 percent of the sum of base funding and serves 10.0 percent of the student FTEs while SDSU has 41.6 percent of the sum of base funding and serves 42.9 percent of the student FTEs. DSU has 5.5 percent of the sum of base funding and serves 5.1 percent of the students. The comparable data for SDSMT, NSU and USD are 9.9 percent and 9.1 percent, 8.0 percent and 7.8 percent and 25.7 percent and 25.2 percent, respectively.

Horizontal Equity Indicator Two: Equal General Funds Per Resident State-Support Student FTE (\$7,425).

In FY12 state general funds per South Dakota resident state-support tuition student FTE for the six universities combined are estimated at \$7,425 (see Table 2, FY12 General Funds per Resident State-Support Student FTE row). As shown in Table 2 and illustrated in Figure 2, the variation among the universities ranges from a low of \$4,267 for BHSU to a high of \$12,484 for SDSMT. This indicator of horizontal equity is aligned with the principle that non-resident tuition is greater than resident tuition by the amount of state general funds supporting South Dakota residents. South Dakota tax dollars, in principle, have not subsidized non-resident students.

Table 8 presents the FY12 base funding with general funds reallocated among the universities so each university’s general funds per resident state-support student FTE equals \$7,425 (see FY12 General funds per Resident State-Support Student FTE row). The Base Funding Adjusted row in Table 8 for each university reflects the adjustment of tuition revenues from BHSU and SDSU to the other four universities to hold each university’s base funding harmless at the FY12 level (noted as Base Funding Adjusted). The Adjustment row in Table 8 violates the principle of financial independence.

Table 8 - FY12 Base Funding: Equal General Funds (\$7,425)							
Per Resident State-Support Student Tuition FTE with Adjustments							
	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds (Before Adjustment)	\$ 7,094,207	\$ 8,097,778	\$ 11,074,588	\$ 13,586,745	\$ 37,488,222	\$ 29,992,859	\$ 107,334,399
General Funds Adjustment	\$ 5,249,319	\$ (1,923,832)	\$ (2,599,886)	\$ (5,506,264)	\$ 7,184,651	\$ (2,403,987)	0
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
FY12 Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
Base Funding	\$ 21,036,350	\$ 10,265,978	\$ 14,644,760	\$ 15,725,912	\$ 81,819,705	\$ 48,809,667	\$ 192,302,373
Adjustment	\$ (5,249,319)	\$ 1,923,832	\$ 2,599,886	\$ 5,506,264	\$ (7,184,651)	\$ 2,403,987	0
Base Funding Adjusted	\$ 15,787,032	\$ 12,189,810	\$ 17,244,646	\$ 21,232,176	\$ 74,635,053	\$ 51,213,655	\$ 192,302,373
FY12 Base Funding with General Funds Proportionate to Resident State-Support Student Consolidated							
	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds(Based on Resident FTE)	\$ 12,343,526	\$ 6,173,946	\$ 8,474,702	\$ 8,080,481	\$ 44,672,873	\$ 27,588,872	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
Tuition	\$ 1,376,242	\$ 5,025,444	\$ 7,266,693	\$ 11,379,984	\$ 21,373,058	\$ 18,432,571	\$ 64,853,992
Base Funding Adjusted	\$ 15,787,032	\$ 12,189,810	\$ 17,244,646	\$ 21,232,176	\$ 74,635,053	\$ 51,213,655	\$ 192,302,373
Univ. Gen. Funds as % of Univ. Base Funding	78.2%	50.6%	49.1%	38.1%	59.9%	53.9%	55.8%
Univ. Base Funding as % of Total Base Funding	8.2%	6.3%	9.0%	11.0%	38.8%	26.6%	100.0%
Per Student FTE Resources							
Fall 2010 Resident State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY12 General funds per Resident State-Support Student FTE	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425
Fall 2010 State-Support Student FTE	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877

To achieve a state of financial independence while assuring funding stability and no reduction in real base funding for any university, the simulations of the annual 14.0 percent tuition increase, again, applied the revenues from 11 percentage points of the tuition increase for each university receiving an adjustment to the reduction in this adjustment. The revenues from three percentage

points of the growth in tuition for receiving universities are applied to their respective base funding. For each year of the simulation, BHSU and SDSU retain all of the revenues from the 14 percentage points of growth in tuition and have the tuition-funded adjustments provided to the other four universities reduced by the revenues from 11 percentage points of growth in tuition at those universities. Upon achieving financial independence, the respective universities retain all revenues from the 14.0 percent tuition increase. The simulations hold all variables constant and increase tuition at a 14.0 percent annual rate.

Tables 9 through 14 are the annual simulations for FY13 through FY18. In FY18 a state of financial independence is achieved and adjustments of tuition revenues from BHSU and SDSU to the other four universities no longer occur.

Table 9 - FY13 Base Funding: Equal General Funds Per Resident Student FTE Simulation							
(14% FY13 Tuition Increase with 11% of 14% Off-Setting FY12 Adjustments)							
	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds	\$ 12,343,526	\$ 6,173,946	\$ 8,474,702	\$ 8,080,481	\$ 44,672,873	\$ 27,588,872	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
FY12 Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
FY13 Earned Tuition Increase	\$ 927,579	\$ 434,226	\$ 653,353	\$ 822,321	\$ 3,998,079	\$ 2,244,002	\$ 9,079,559
Base Funding	\$ 21,963,929	\$ 10,700,204	\$ 15,298,113	\$ 16,548,233	\$ 85,817,784	\$ 51,053,669	\$ 201,381,932
Adjustment	\$ (3,871,431)	\$ 1,582,655	\$ 2,086,537	\$ 4,860,155	\$ (5,298,760)	\$ 640,843	\$ 0
Base Funding Adjusted	\$ 18,092,498	\$ 12,282,859	\$ 17,384,650	\$ 21,408,388	\$ 80,519,024	\$ 51,694,512	\$ 201,381,932
Univ. Gen. Funds as % of Univ. Base Funding	68.2%	50.3%	48.7%	37.7%	55.5%	53.4%	53.3%
Univ. Base Funding as % of Total Base Funding	9.0%	6.1%	8.6%	10.6%	40.0%	25.7%	100.0%
Per Student FTE Resources							
Fall 2010 <u>Resident</u> State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY13 General funds per Resident State-Support Student FTE	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425
Fall 2010 <u>State-Support</u> Student FTE	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877
FY13 Base Funding per State-Support Student FTE	\$ 8,315	\$ 11,197	\$ 10,342	\$ 10,878	\$ 8,672	\$ 9,475	\$ 9,296

Table 10 - FY14 Base Funding: Equal General Funds Per Resident Student FTE Simulation							
(14% FY14 Tuition Increase with 11% of 14% Off-Setting FY13 Adjustments)							
	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds	\$ 12,343,526	\$ 6,173,946	\$ 8,474,702	\$ 8,080,481	\$ 44,672,873	\$ 27,588,872	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
FY12 Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
FY13 Earned Tuition Increase	\$ 927,579	\$ 434,226	\$ 653,353	\$ 822,321	\$ 3,998,079	\$ 2,244,002	\$ 9,079,559
FY14 Earned Tuition Increase	\$ 1,057,440	\$ 495,017	\$ 744,822	\$ 937,446	\$ 4,557,810	\$ 2,558,162	\$ 10,350,697
Base Funding	\$ 23,021,368	\$ 11,195,221	\$ 16,042,936	\$ 17,485,678	\$ 90,375,594	\$ 53,611,831	\$ 211,732,629
Adjustment	\$ (2,878,656)	\$ 1,193,713	\$ 1,501,319	\$ 4,123,591	\$ (3,939,967)	\$ 0	\$ (0)
Base Funding Adjusted	\$ 20,142,712	\$ 12,388,934	\$ 17,544,255	\$ 21,609,269	\$ 86,435,628	\$ 53,611,831	\$ 211,732,629
Univ. Gen. Funds as % of Univ. Base Funding	61.3%	49.8%	48.3%	37.4%	51.7%	51.5%	50.7%
Univ. Base Funding as % of Total Base Funding	9.5%	5.9%	8.3%	10.2%	40.8%	25.3%	100.0%
Per Student FTE Resources							
Fall 2010 <u>Resident</u> State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY14 General funds per Resident State-Support Student FTE	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425
Fall 2010 <u>State-Support</u> Student FTE	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877
FY13 Base Funding per State-Support Student FTE	\$ 8,315	\$ 11,197	\$ 10,342	\$ 10,878	\$ 8,672	\$ 9,475	\$ 9,296
FY14 Base Funding per State-Support Student FTE	\$ 9,257	\$ 11,293	\$ 10,437	\$ 10,980	\$ 9,309	\$ 9,826	\$ 9,774

Table 11 - FY15 Base Funding: Equal General Funds Per Resident Student FTE Simulation							
(14% FY15 Tuition Increase with 11% of 14% Off-Setting FY14 Adjustments)							
	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds	\$ 12,343,526	\$ 6,173,946	\$ 8,474,702	\$ 8,080,481	\$ 44,672,873	\$ 27,588,872	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
FY12 Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
FY13 Earned Tuition Increase	\$ 927,579	\$ 434,226	\$ 653,353	\$ 822,321	\$ 3,998,079	\$ 2,244,002	\$ 9,079,559
FY14 Earned Tuition Increase	\$ 1,057,440	\$ 495,017	\$ 744,822	\$ 937,446	\$ 4,557,810	\$ 2,558,162	\$ 10,350,697
FY15 Earned Tuition Increase	\$ 1,205,481	\$ 564,320	\$ 849,098	\$ 1,068,688	\$ 5,195,904	\$ 2,916,305	\$ 11,799,795
Base Funding	\$ 24,226,849	\$ 11,759,541	\$ 16,892,033	\$ 18,554,367	\$ 95,571,498	\$ 56,528,136	\$ 223,532,424
Adjustment	\$ (2,055,319)	\$ 750,319	\$ 834,171	\$ 3,283,907	\$ (2,813,079)	0	\$ (0)
Base Funding Adjusted	\$ 22,171,531	\$ 12,509,860	\$ 17,726,205	\$ 21,838,274	\$ 92,758,419	\$ 56,528,136	\$ 223,532,424
Univ. Gen. Funds as % of Univ. Base Funding	55.7%	49.4%	47.8%	37.0%	48.2%	48.8%	48.0%
Univ. Base Funding as % of Total Base Funding	9.9%	5.6%	7.9%	9.8%	41.5%	25.3%	100.0%
Per Student FTE Resources							
Fall 2010 <u>Resident</u> State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY15 General funds per Resident State-Support Student FTE	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425
Fall 2010 <u>State-Support</u> Student FTE	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877
FY13 Base Funding per State-Support Student FTE	\$ 8,315	\$ 11,197	\$ 10,342	\$ 10,878	\$ 8,672	\$ 9,475	\$ 9,296
FY14 Base Funding per State-Support Student FTE	\$ 9,257	\$ 11,293	\$ 10,437	\$ 10,980	\$ 9,309	\$ 9,826	\$ 9,774
FY15 Base Funding per State-Support Student FTE	\$ 10,189	\$ 11,404	\$ 10,545	\$ 11,097	\$ 9,990	\$ 10,361	\$ 10,319

Table 12 - FY16 Base Funding: Equal General Funds Per Resident Student FTE Simulation							
(14% FY16 Tuition Increase with 11% of 14% Off-Setting FY15 Adjustments)							
	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds	\$ 12,343,526	\$ 6,173,946	\$ 8,474,702	\$ 8,080,481	\$ 44,672,873	\$ 27,588,872	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
FY12 Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
FY13 Earned Tuition Increase	\$ 927,579	\$ 434,226	\$ 653,353	\$ 822,321	\$ 3,998,079	\$ 2,244,002	\$ 9,079,559
FY14 Earned Tuition Increase	\$ 1,057,440	\$ 495,017	\$ 744,822	\$ 937,446	\$ 4,557,810	\$ 2,558,162	\$ 10,350,697
FY15 Earned Tuition Increase	\$ 1,205,481	\$ 564,320	\$ 849,098	\$ 1,068,688	\$ 5,195,904	\$ 2,916,305	\$ 11,799,795
FY16 Earned Tuition Increase	\$ 1,374,248	\$ 643,324	\$ 967,971	\$ 1,218,304	\$ 5,923,330	\$ 3,324,587	\$ 13,451,766
Base Funding	\$ 25,601,098	\$ 12,402,865	\$ 17,860,005	\$ 19,772,671	\$ 101,494,829	\$ 59,852,723	\$ 236,984,190
Adjustment	\$ (1,116,714)	\$ 244,850	\$ 73,622	\$ 2,326,668	\$ (1,528,427)	0	\$ (0)
Base Funding Adjusted	\$ 24,484,384	\$ 12,647,715	\$ 17,933,627	\$ 22,099,339	\$ 99,966,402	\$ 59,852,723	\$ 236,984,190
Univ. Gen. Funds as % of Univ. Base Funding	50.4%	48.8%	47.3%	36.6%	44.7%	46.1%	45.3%
Univ. Base Funding as % of Total Base Funding	10.3%	5.3%	7.6%	9.3%	42.2%	25.3%	100.0%
Per Student FTE Resources							
Fall 2010 <u>Resident</u> State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY16 General funds per Resident State-Support Student FTE	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425
Fall 2010 <u>State-Support</u> Student FTE	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877
FY13 Base Funding per State-Support Student FTE	\$ 8,315	\$ 11,197	\$ 10,342	\$ 10,878	\$ 8,672	\$ 9,475	\$ 9,296
FY14 Base Funding per State-Support Student FTE	\$ 9,257	\$ 11,293	\$ 10,437	\$ 10,980	\$ 9,309	\$ 9,826	\$ 9,774
FY15 Base Funding per State-Support Student FTE	\$ 10,189	\$ 11,404	\$ 10,545	\$ 11,097	\$ 9,990	\$ 10,361	\$ 10,319
FY16 Base Funding per State-Support Student FTE	\$ 11,252	\$ 11,529	\$ 10,668	\$ 11,229	\$ 10,766	\$ 10,970	\$ 10,940

**Table 13 - FY17 Base Funding: Equal General Funds Per Resident Student FTE Simulation
(14% FY17 Tuition Increase with 11% of 14% Off-Setting FY16 Adjustments)**

	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds	\$ 12,343,526	\$ 6,173,946	\$ 8,474,702	\$ 8,080,481	\$ 44,672,873	\$ 27,588,872	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
FY12 Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
FY13 Earned Tuition Increase	\$ 927,579	\$ 434,226	\$ 653,353	\$ 822,321	\$ 3,998,079	\$ 2,244,002	\$ 9,079,559
FY14 Earned Tuition Increase	\$ 1,057,440	\$ 495,017	\$ 744,822	\$ 937,446	\$ 4,557,810	\$ 2,558,162	\$ 10,350,697
FY15 Earned Tuition Increase	\$ 1,205,481	\$ 564,320	\$ 849,098	\$ 1,068,688	\$ 5,195,904	\$ 2,916,305	\$ 11,799,795
FY16 Earned Tuition Increase	\$ 1,374,248	\$ 643,324	\$ 967,971	\$ 1,218,304	\$ 5,923,330	\$ 3,324,587	\$ 13,451,766
FY17 Earned Tuition Increase	\$ 1,566,643	\$ 733,390	\$ 1,103,487	\$ 1,388,867	\$ 6,752,597	\$ 3,790,029	\$ 15,335,013
Base Funding	\$ 27,167,741	\$ 13,136,255	\$ 18,963,492	\$ 21,161,538	\$ 108,247,525	\$ 63,642,752	\$ 252,319,203
Adjustment	\$ (521,562)	0	0	1,235,416	\$ (713,853)	0	\$ (0)
Base Funding Adjusted	\$ 26,646,179	\$ 13,136,255	\$ 18,963,492	\$ 22,396,953	\$ 107,533,572	\$ 63,642,752	\$ 252,319,203
Univ. Gen. Funds as % of Univ. Base Funding	46.3%	47.0%	44.7%	36.1%	41.5%	43.3%	42.5%
Univ. Base Funding as % of Total Base Funding	10.6%	5.2%	7.5%	8.9%	42.6%	25.2%	100.0%
Per Student FTE Resources							
Fall 2010 <u>Resident</u> State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY17 General funds per Resident State-Support Student FTE	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425
Fall 2010 <u>State-Support</u> Student FTE	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877
FY13 Base Funding per State-Support Student FTE	\$ 8,315	\$ 11,197	\$ 10,342	\$ 10,878	\$ 8,672	\$ 9,475	\$ 9,296
FY14 Base Funding per State-Support Student FTE	\$ 9,257	\$ 11,293	\$ 10,437	\$ 10,980	\$ 9,309	\$ 9,826	\$ 9,774
FY15 Base Funding per State-Support Student FTE	\$ 10,189	\$ 11,404	\$ 10,545	\$ 11,097	\$ 9,990	\$ 10,361	\$ 10,319
FY16 Base Funding per State-Support Student FTE	\$ 11,252	\$ 11,529	\$ 10,668	\$ 11,229	\$ 10,766	\$ 10,970	\$ 10,940
FY17 Base Funding per State-Support Student FTE	\$ 12,245	\$ 11,975	\$ 11,281	\$ 11,381	\$ 11,581	\$ 11,665	\$ 11,647

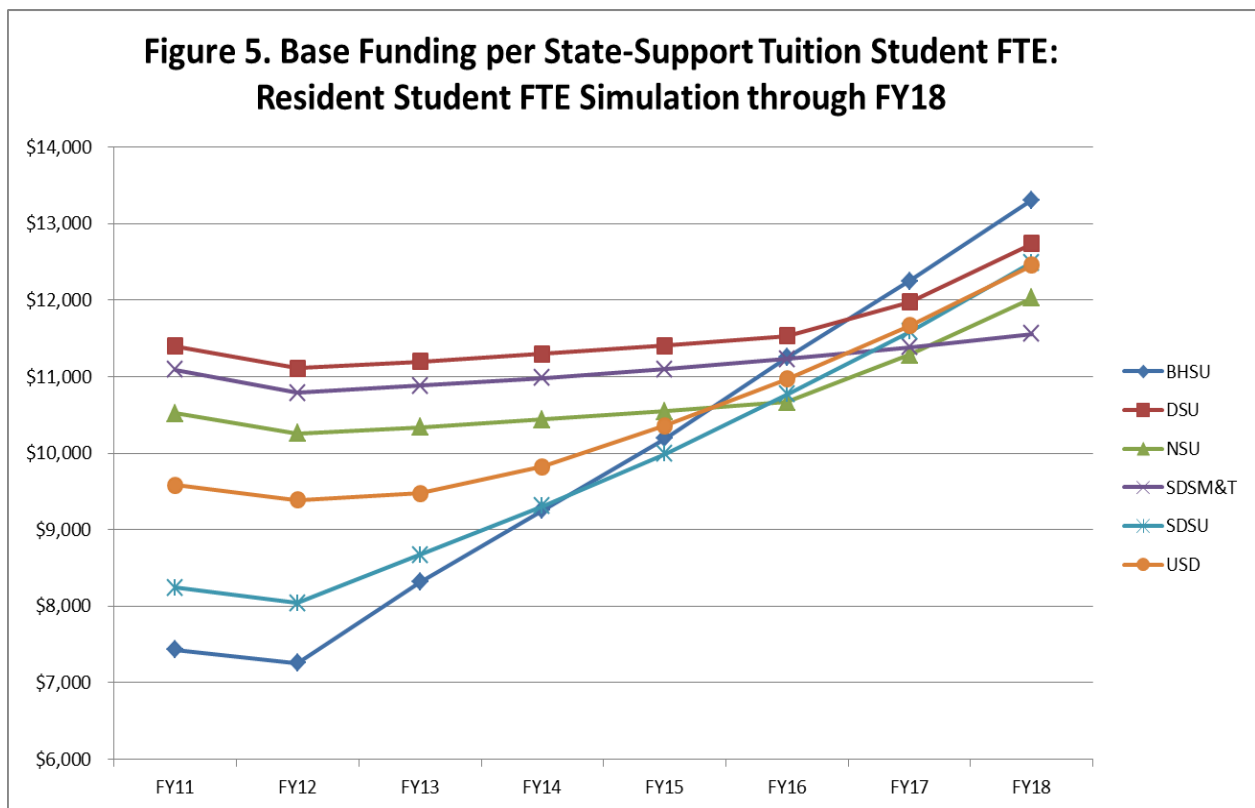
**Table 14 - FY18 Base Funding: Equal General Funds Per Resident Student FTE Simulation
(14% FY18 Tuition Increase with 11% of 14% Off-Setting FY17 Adjustments)**

	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds	\$ 12,343,526	\$ 6,173,946	\$ 8,474,702	\$ 8,080,481	\$ 44,672,873	\$ 27,588,872	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
FY12 Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
FY13 Earned Tuition Increase	\$ 927,579	\$ 434,226	\$ 653,353	\$ 822,321	\$ 3,998,079	\$ 2,244,002	\$ 9,079,559
FY14 Earned Tuition Increase	\$ 1,057,440	\$ 495,017	\$ 744,822	\$ 937,446	\$ 4,557,810	\$ 2,558,162	\$ 10,350,697
FY15 Earned Tuition Increase	\$ 1,205,481	\$ 564,320	\$ 849,098	\$ 1,068,688	\$ 5,195,904	\$ 2,916,305	\$ 11,799,795
FY16 Earned Tuition Increase	\$ 1,374,248	\$ 643,324	\$ 967,971	\$ 1,218,304	\$ 5,923,330	\$ 3,324,587	\$ 13,451,766
FY17 Earned Tuition Increase	\$ 1,566,643	\$ 733,390	\$ 1,103,487	\$ 1,388,867	\$ 6,752,597	\$ 3,790,029	\$ 15,335,013
FY18 Earned Tuition Increase	\$ 1,785,973	\$ 836,064	\$ 1,257,975	\$ 1,583,308	\$ 7,697,960	\$ 4,320,634	\$ 17,481,915
Adjustment	0	0	0	0	0	0	0
Base Funding	\$ 28,953,714	\$ 13,972,319	\$ 20,221,467	\$ 22,744,846	\$ 115,945,386	\$ 67,963,386	\$ 269,801,118
Univ. Gen. Funds as % of Univ. Base Funding	42.6%	44.2%	41.9%	35.5%	38.5%	40.6%	39.8%
Univ. Base Funding as % of Total Base Funding	10.7%	5.2%	7.5%	8.4%	43.0%	25.2%	100.0%
Per Student FTE Resources							
Fall 2010 <u>Resident</u> State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY18 General funds per Resident State-Support Student FTE	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425	\$ 7,425
Fall 2010 <u>State-Support</u> Student FTE	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877
FY13 Base Funding per State-Support Student FTE	\$ 8,315	\$ 11,197	\$ 10,342	\$ 10,878	\$ 8,672	\$ 9,475	\$ 9,296
FY14 Base Funding per State-Support Student FTE	\$ 9,257	\$ 11,293	\$ 10,437	\$ 10,980	\$ 9,309	\$ 9,826	\$ 9,774
FY15 Base Funding per State-Support Student FTE	\$ 10,189	\$ 11,404	\$ 10,545	\$ 11,097	\$ 9,990	\$ 10,361	\$ 10,319
FY16 Base Funding per State-Support Student FTE	\$ 11,252	\$ 11,529	\$ 10,668	\$ 11,229	\$ 10,766	\$ 10,970	\$ 10,940
FY17 Base Funding per State-Support Student FTE	\$ 12,245	\$ 11,975	\$ 11,281	\$ 11,381	\$ 11,581	\$ 11,665	\$ 11,647
FY18 Base Funding per State-Support Student FTE	\$ 13,306	\$ 12,737	\$ 12,029	\$ 11,557	\$ 12,487	\$ 12,457	\$ 12,454

In FY14 USD achieves financial independence as presented in Table 10 noted by a zero in the USD column for the Adjustment row. In FY17, as presented in Table 13, NSU and DSU achieve financial independence. In FY17 SDSMT receives an Adjustment of \$1,235,416 from BHSU and SDSU and realizes financial independence in FY18, as shown in Table 14.

Note in Table 14 in the FY18 General funds per Resident State-Support Student FTE row is \$7,425 for each university and for the system in total.

Shown at the lower part of Tables 9 through 14 are base funding per state-support student FTE for each university, year by year, through the simulation period. Thus, Table 14 has these ratios for each year of the simulation, FY13 through FY18 (six fiscal years), and the baseline FY12. All universities experienced base funding growth over the simulation period and realize growth in base funding per state-support tuition student FTE (see Figure 5).



For example, DSU per student FTE base funding increased from \$11,112 in FY12 to \$12,737 in FY18. The comparable figures for BHSU are \$7,255 and \$13,306, respectively. The weighted mean base funding per student FTE in FY18 is \$12,454 for the system.

Under the assumption of constant enrollment and enrollment mix, in FY18, the first year all universities are financially independent under this indicator of horizontal equity (shown in Table 14) BHSU has 10.7 percent of the sum of base funding and serves 10.0 percent of the student FTEs while SDSU has 43.0 percent of the sum of base funding and serves 42.9 percent of the state-support tuition student FTEs. DSU has 5.2 percent of the sum of base funding and serves

5.1 percent of the student FTEs. SDSMT has 8.4 percent of the sum of base funding and serves 9.1 percent of the student FTEs. The comparable data for NSU and USD are 7.5 percent and 7.8 percent and 25.2 percent and 25.2 percent, respectively.

With financial independence for each university in FY18, guided by equal general state funds per South Dakota resident state-support tuition student FTE as the indicator of horizontal equity, the percent of state general funds of the total and the percentage of South Dakota residents served are equal at each university. These data are, in reverse rank order:

- DSU: 5.8 percent of general funds and 5.8 percent of resident student FTEs,
- SDSMT: 7.5 percent of general funds and 7.5 percent of resident student FTEs,
- NSU: 7.9 percent of general funds and 7.9 percent of resident student FTEs,
- BHSU: 11.5 percent of general funds and 11.5 percent of resident student FTEs,
- USD: 25.7 percent of general funds and 25.7 percent of resident student FTEs, and
- SDSU: 41.6 percent of general funds and 41.6 percent of resident student FTEs.

Horizontal Equity Indicator Three: Equal Base Funding Per State-Support Student FTE (\$12,454) By FY18.

In FY12 base funding per state-support tuition student FTE for the six universities combined is estimated at \$8,877 (see Table 2, FY12 Base Funding per State-Support Student FTE row). As shown in Table 2 and illustrated in Figure 3, the variation among the universities ranged from a low of \$7,255 for BHSU to a high of \$11,112 for DSU. The simulation of 14.0 percent annual tuition increase yielded \$12,454 base funding per state-support student FTE in FY18 (see Table 21, Total column). This is the horizontal equity indicator for this scenario.

Table 15 contains the FY12 base funding with general funds reallocated among the universities so each university's state general funds, and SCF revenues plus "own" tuition revenues by FY18 yield a per student FTE base funding support of \$12,454. The Base Funding Adjusted row in Table 15 for each university reflects the adjustment of tuition revenues from BHSU and SDSU to the other four universities to hold each university's base funding harmless at the FY12 level (noted in the Base Funding Adjusted row). The Adjustment row in Table 15 violates the principle of financial independence.

Table 15 - FY12 Base Funding: Equal Base Funding							
Per State-Support Student Tuition FTE in FY18 (\$12,454) with Adjustments							
	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
FY12 General Funds (Before Adjustment)	\$ 7,094,207	\$ 8,097,778	\$ 11,074,588	\$ 13,586,745	\$ 37,488,222	\$ 29,992,859	\$ 107,334,399
General Funds Adjustment	\$ 3,396,524	\$ (2,233,601)	\$ (1,885,394)	\$ (3,740,720)	\$ 6,878,991	\$ (2,415,801)	\$ (0)
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
FY12 Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
Base Funding	\$ 19,183,556	\$ 9,956,209	\$ 15,359,252	\$ 17,491,457	\$ 81,514,045	\$ 48,797,853	\$ 192,302,373
Adjustment	\$ (3,396,524)	\$ 2,233,601	\$ 1,885,394	\$ 3,740,720	\$ (6,878,991)	\$ 2,415,801	\$ 0
Base Funding Adjusted	\$ 15,787,032	\$ 12,189,810	\$ 17,244,646	\$ 21,232,176	\$ 74,635,053	\$ 51,213,655	\$ 192,302,373
FY12 Base Funding: To Achieve Equal Base Funding per State-Support Student FTE no later than FY18 Consolidated							
	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds (Based on Student FTE)	\$ 10,490,731	\$ 5,864,177	\$ 9,189,194	\$ 9,846,025	\$ 44,367,213	\$ 27,577,058	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
Tuition	\$ 3,229,036	\$ 5,335,213	\$ 6,552,201	\$ 9,614,439	\$ 21,678,718	\$ 18,444,385	\$ 64,853,992
Base Funding Adjusted	\$ 15,787,032	\$ 12,189,810	\$ 17,244,646	\$ 21,232,176	\$ 74,635,053	\$ 51,213,655	\$ 192,302,373
Univ. Gen. Funds as % of Univ. Base Funding	66.5%	48.1%	53.3%	46.4%	59.4%	53.8%	55.8%
Univ. Base Funding as % of Total Base Funding	8.2%	6.3%	9.0%	11.0%	38.8%	26.6%	100.0%
Per Student FTE Resources							
Fall 2010 <u>Resident</u> State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY12 General funds per Resident State-Support Student FTE	\$ 6,310	\$ 7,052	\$ 8,051	\$ 9,047	\$ 7,374	\$ 7,422	\$ 7,425
Fall 2010 <u>State-Support</u> Student FTE	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877

To achieve financial independence while assuring funding stability and no reduction in real base funding for any university and to do so by FY18, the simulations of the annual 14.0 percent tuition increase reduced the adjustment in FY12 (Table 15) by one-sixth annually, FY 13 through FY18. To illustrate, the adjustment for NSU in Table 15 is \$1,885,394; one sixth of this amount is \$314,232 (rounded); the adjustment in Table 16, FY13 for NSU is \$1,571,161 which is \$1,885,394 less \$314,232.

For each year of the simulations, BHSU and SDSU retain all of the revenues from the 14 percentage points of growth in tuition. The tuition-funded adjustments provided to the other four universities are reduced by one sixth of the respective universities' adjustment in Table 15 to reach financial independence by FY18. Recall the simulations hold all variables constant and increase tuition 14.0 percent annually.

Tables 16 through 21 are the simulations for FY13 through FY18. In FY18 a state of financial independence is achieved and adjustments of tuition revenues from BHSU and SDSU to the other four universities no longer occur. By the design of this simulation, the four universities receiving adjustments from BHSU and SDSU become financially independent in FY18 (see Table 21).

Table 16 - FY13 Base Funding: Equal Base Funding Per State-Support Student FTE Simulation							
(14% FY13 Tuition Increase with Adjustments Reduced at a Fixed Amount per Year)							
	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds	\$ 10,490,731	\$ 5,864,177	\$ 9,189,194	\$ 9,846,025	\$ 44,367,213	\$ 27,577,058	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
FY12 Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
FY13 Earned Tuition Increase	\$ 927,579	\$ 434,226	\$ 653,353	\$ 822,321	\$ 3,998,079	\$ 2,244,002	\$ 9,079,559
Base Funding	\$ 20,111,135	\$ 10,390,435	\$ 16,012,605	\$ 18,313,777	\$ 85,512,124	\$ 51,041,855	\$ 201,381,932
Adjustment	\$ (2,830,437)	\$ 1,861,334	\$ 1,571,161	\$ 3,117,266	\$ (5,732,493)	\$ 2,013,168	\$ 0
Base Funding Adjusted	\$ 17,280,698	\$ 12,251,769	\$ 17,583,767	\$ 21,431,044	\$ 79,779,631	\$ 53,055,023	\$ 201,381,932
Univ. Gen. Funds as % of Univ. Base Funding	60.7%	47.9%	52.3%	45.9%	55.6%	52.0%	53.3%
Univ. Base Funding as % of Total Base Funding	8.6%	6.1%	8.7%	10.6%	39.6%	26.3%	100.0%
Per Student FTE Resources							
Fall 2010 <u>Resident</u> State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY13 General funds per Resident State-Support Student FTE	\$ 6,310	\$ 7,052	\$ 8,051	\$ 9,047	\$ 7,374	\$ 7,422	\$ 7,425
Fall 2010 <u>State-Support</u> Student FTE	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877
FY13 Base Funding per State-Support Student FTE	\$ 7,941	\$ 11,168	\$ 10,460	\$ 10,890	\$ 8,592	\$ 9,724	\$ 9,296

Table 17 - FY14 Base Funding: Equal Base Funding Per State Support Student FTE Simulation							
(14% FY14 Tuition Increase with Adjustments Reduced at a Fixed Amount per Year)							
	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds	\$ 10,490,731	\$ 5,864,177	\$ 9,189,194	\$ 9,846,025	\$ 44,367,213	\$ 27,577,058	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
FY12 Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
FY13 Earned Tuition Increase	\$ 927,579	\$ 434,226	\$ 653,353	\$ 822,321	\$ 3,998,079	\$ 2,244,002	\$ 9,079,559
FY14 Earned Tuition Increase	\$ 1,057,440	\$ 495,017	\$ 744,822	\$ 937,446	\$ 4,557,810	\$ 2,558,162	\$ 10,350,697
Base Funding	\$ 21,168,574	\$ 10,885,452	\$ 16,757,428	\$ 19,251,223	\$ 90,069,934	\$ 53,600,017	\$ 211,732,629
Adjustment	\$ (2,264,350)	\$ 1,489,067	\$ 1,256,929	\$ 2,493,813	\$ (4,585,994)	\$ 1,610,534	\$ 0
Base Funding Adjusted	\$ 18,904,225	\$ 12,374,520	\$ 18,014,357	\$ 21,745,036	\$ 85,483,940	\$ 55,210,551	\$ 211,732,629
Univ. Gen. Funds as % of Univ. Base Funding	55.5%	47.4%	51.0%	45.3%	51.9%	49.9%	50.7%
Univ. Base Funding as % of Total Base Funding	8.9%	5.8%	8.5%	10.3%	40.4%	26.1%	100.0%
Per Student FTE Resources							
Fall 2010 <u>Resident</u> State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY14 General funds per Resident State-Support Student FTE	\$ 6,310	\$ 7,052	\$ 8,051	\$ 9,047	\$ 7,374	\$ 7,422	\$ 7,425
Fall 2010 <u>State-Support</u> Student FTE	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877
FY13 Base Funding per State-Support Student FTE	\$ 7,941	\$ 11,168	\$ 10,460	\$ 10,890	\$ 8,592	\$ 9,724	\$ 9,296
FY14 Base Funding per State-Support Student FTE	\$ 8,688	\$ 11,280	\$ 10,716	\$ 11,049	\$ 9,207	\$ 10,119	\$ 9,774

Table 18 - FY15 Base Funding: Equal Base Funding Per State-Support Student FTE Simulation							
(14% FY15 Tuition Increase with Adjustments Reduced at a Fixed Amount per Year)							
	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds	\$ 10,490,731	\$ 5,864,177	\$ 9,189,194	\$ 9,846,025	\$ 44,367,213	\$ 27,577,058	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
FY12 Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
FY13 Earned Tuition Increase	\$ 927,579	\$ 434,226	\$ 653,353	\$ 822,321	\$ 3,998,079	\$ 2,244,002	\$ 9,079,559
FY14 Earned Tuition Increase	\$ 1,057,440	\$ 495,017	\$ 744,822	\$ 937,446	\$ 4,557,810	\$ 2,558,162	\$ 10,350,697
FY15 Earned Tuition Increase	\$ 1,205,481	\$ 564,320	\$ 849,098	\$ 1,068,688	\$ 5,195,904	\$ 2,916,305	\$ 11,799,795
Base Funding	\$ 22,374,055	\$ 11,449,772	\$ 17,606,525	\$ 20,319,911	\$ 95,265,838	\$ 56,516,321	\$ 223,532,424
Adjustment	\$ (1,698,262)	\$ 1,116,801	\$ 942,697	\$ 1,870,360	\$ (3,439,496)	\$ 1,207,901	\$ 0
Base Funding Adjusted	\$ 20,675,793	\$ 12,566,572	\$ 18,549,222	\$ 22,190,271	\$ 91,826,343	\$ 57,724,222	\$ 223,532,424
Univ. Gen. Funds as % of Univ. Base Funding	50.7%	46.7%	49.5%	44.4%	48.3%	47.8%	48.0%
Univ. Base Funding as % of Total Base Funding	9.2%	5.6%	8.3%	9.9%	41.1%	25.8%	100.0%
Per Student FTE Resources							
Fall 2010 <u>Resident</u> State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY15 General funds per Resident State-Support Student FTE	\$ 6,310	\$ 7,052	\$ 8,051	\$ 9,047	\$ 7,374	\$ 7,422	\$ 7,425
Fall 2010 <u>State-Support Student FTE</u>	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877
FY13 Base Funding per State-Support Student FTE	\$ 7,941	\$ 11,168	\$ 10,460	\$ 10,890	\$ 8,592	\$ 9,724	\$ 9,296
FY14 Base Funding per State-Support Student FTE	\$ 8,688	\$ 11,280	\$ 10,716	\$ 11,049	\$ 9,207	\$ 10,119	\$ 9,774
FY15 Base Funding per State-Support Student FTE	\$ 9,502	\$ 11,455	\$ 11,035	\$ 11,276	\$ 9,890	\$ 10,580	\$ 10,319

Table 19 - FY16 Base Funding: Equal Base Funding Per State-Support Student FTE Simulation							
(14% FY16 Tuition Increase with Adjustments Reduced at a Fixed Amount per Year)							
	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds	\$ 10,490,731	\$ 5,864,177	\$ 9,189,194	\$ 9,846,025	\$ 44,367,213	\$ 27,577,058	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
FY12 Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
FY13 Earned Tuition Increase	\$ 927,579	\$ 434,226	\$ 653,353	\$ 822,321	\$ 3,998,079	\$ 2,244,002	\$ 9,079,559
FY14 Earned Tuition Increase	\$ 1,057,440	\$ 495,017	\$ 744,822	\$ 937,446	\$ 4,557,810	\$ 2,558,162	\$ 10,350,697
FY15 Earned Tuition Increase	\$ 1,205,481	\$ 564,320	\$ 849,098	\$ 1,068,688	\$ 5,195,904	\$ 2,916,305	\$ 11,799,795
FY16 Earned Tuition Increase	\$ 1,374,248	\$ 643,324	\$ 967,971	\$ 1,218,304	\$ 5,923,330	\$ 3,324,587	\$ 13,451,766
Base Funding	\$ 23,748,304	\$ 12,093,096	\$ 18,574,497	\$ 21,538,215	\$ 101,189,169	\$ 59,840,909	\$ 236,984,189
Adjustment	\$ (1,132,175)	\$ 744,534	\$ 628,465	\$ 1,246,907	\$ (2,292,997)	\$ 805,267	\$ 0
Base Funding Adjusted	\$ 22,616,129	\$ 12,837,630	\$ 19,202,961	\$ 22,785,122	\$ 98,896,172	\$ 60,646,176	\$ 236,984,189
Univ. Gen. Funds as % of Univ. Base Funding	46.4%	45.7%	47.9%	43.2%	44.9%	45.5%	45.3%
Univ. Base Funding as % of Total Base Funding	9.5%	5.4%	8.1%	9.6%	41.7%	25.6%	100.0%
Per Student FTE Resources							
Fall 2010 <u>Resident</u> State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY16 General funds per Resident State-Support Student FTE	\$ 6,310	\$ 7,052	\$ 8,051	\$ 9,047	\$ 7,374	\$ 7,422	\$ 7,425
Fall 2010 <u>State-Support Student FTE</u>	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877
FY13 Base Funding per State-Support Student FTE	\$ 7,941	\$ 11,168	\$ 10,460	\$ 10,890	\$ 8,592	\$ 9,724	\$ 9,296
FY14 Base Funding per State-Support Student FTE	\$ 8,688	\$ 11,280	\$ 10,716	\$ 11,049	\$ 9,207	\$ 10,119	\$ 9,774
FY15 Base Funding per State-Support Student FTE	\$ 9,502	\$ 11,455	\$ 11,035	\$ 11,276	\$ 9,890	\$ 10,580	\$ 10,319
FY16 Base Funding per State-Support Student FTE	\$ 10,393	\$ 11,702	\$ 11,424	\$ 11,578	\$ 10,651	\$ 11,116	\$ 10,940

**Table 20 - FY17 Base Funding: Equal Base Funding Per State-Support Student FTE Simulation
(14% FY17 Tuition Increase with Adjustments Reduced at a Fixed Amount per Year)**

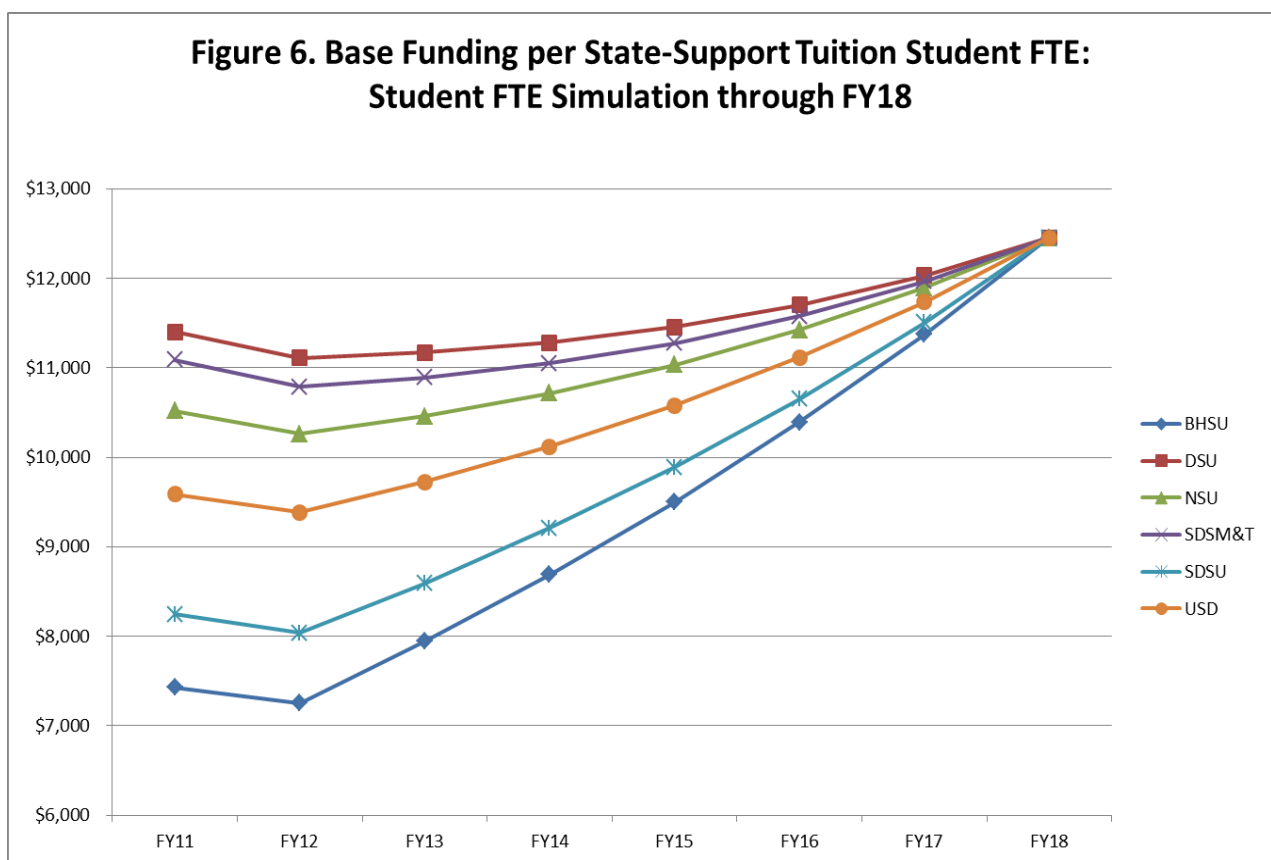
	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds	\$ 10,490,731	\$ 5,864,177	\$ 9,189,194	\$ 9,846,025	\$ 44,367,213	\$ 27,577,058	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
FY12 Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
FY13 Earned Tuition Increase	\$ 927,579	\$ 434,226	\$ 653,353	\$ 822,321	\$ 3,998,079	\$ 2,244,002	\$ 9,079,559
FY14 Earned Tuition Increase	\$ 1,057,440	\$ 495,017	\$ 744,822	\$ 937,446	\$ 4,557,810	\$ 2,558,162	\$ 10,350,697
FY15 Earned Tuition Increase	\$ 1,205,481	\$ 564,320	\$ 849,098	\$ 1,068,688	\$ 5,195,904	\$ 2,916,305	\$ 11,799,795
FY16 Earned Tuition Increase	\$ 1,374,248	\$ 643,324	\$ 967,971	\$ 1,218,304	\$ 5,923,330	\$ 3,324,587	\$ 13,451,766
FY17 Earned Tuition Increase	\$ 1,566,643	\$ 733,390	\$ 1,103,487	\$ 1,388,867	\$ 6,752,597	\$ 3,790,029	\$ 15,335,013
Base Funding	\$ 25,314,947	\$ 12,826,486	\$ 19,677,984	\$ 22,927,082	\$ 107,941,766	\$ 63,630,938	\$ 252,319,203
Adjustment	\$ (566,087)	\$ 372,267	\$ 314,232	\$ 623,453	\$ (1,146,499)	\$ 402,634	\$ 0
Base Funding Adjusted	\$ 24,748,859	\$ 13,198,753	\$ 19,992,216	\$ 23,550,536	\$ 106,795,267	\$ 64,033,572	\$ 252,319,203
Univ. Gen. Funds as % of Univ. Base Funding	42.4%	44.4%	46.0%	41.8%	41.5%	43.1%	42.5%
Univ. Base Funding as % of Total Base Funding	9.8%	5.2%	7.9%	9.3%	42.3%	25.4%	100.0%
Per Student FTE Resources							
Fall 2010 <u>Resident</u> State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY17 General funds per Resident State-Support Student FTE	\$ 6,310	\$ 7,052	\$ 8,051	\$ 9,047	\$ 7,374	\$ 7,422	\$ 7,425
Fall 2010 <u>State-Support</u> Student FTE	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877
FY13 Base Funding per State-Support Student FTE	\$ 7,941	\$ 11,168	\$ 10,460	\$ 10,890	\$ 8,592	\$ 9,724	\$ 9,296
FY14 Base Funding per State-Support Student FTE	\$ 8,688	\$ 11,280	\$ 10,716	\$ 11,049	\$ 9,207	\$ 10,119	\$ 9,774
FY15 Base Funding per State-Support Student FTE	\$ 9,502	\$ 11,455	\$ 11,035	\$ 11,276	\$ 9,890	\$ 10,580	\$ 10,319
FY16 Base Funding per State-Support Student FTE	\$ 10,393	\$ 11,702	\$ 11,424	\$ 11,578	\$ 10,651	\$ 11,116	\$ 10,940
FY17 Base Funding per State-Support Student FTE	\$ 11,374	\$ 12,032	\$ 11,893	\$ 11,967	\$ 11,502	\$ 11,736	\$ 11,647

**Table 21 - FY18 Base Funding: Equal Base Funding Per State-Support Student FTE Simulation
(14% FY18 Tuition Increase with Adjustments Reduced at a Fixed Amount per Year)**

	BHSU	DSU	NSU	SDSM&T	SDSU	USD	Total
General Funds	\$ 10,490,731	\$ 5,864,177	\$ 9,189,194	\$ 9,846,025	\$ 44,367,213	\$ 27,577,058	\$ 107,334,399
SCF	\$ 2,067,264	\$ 990,421	\$ 1,503,251	\$ 1,771,712	\$ 8,589,122	\$ 5,192,212	\$ 20,113,982
FY12 Earned Tuition	\$ 6,625,561	\$ 3,101,611	\$ 4,666,807	\$ 5,873,719	\$ 28,557,709	\$ 16,028,584	\$ 64,853,992
FY13 Earned Tuition Increase	\$ 927,579	\$ 434,226	\$ 653,353	\$ 822,321	\$ 3,998,079	\$ 2,244,002	\$ 9,079,559
FY14 Earned Tuition Increase	\$ 1,057,440	\$ 495,017	\$ 744,822	\$ 937,446	\$ 4,557,810	\$ 2,558,162	\$ 10,350,697
FY15 Earned Tuition Increase	\$ 1,205,481	\$ 564,320	\$ 849,098	\$ 1,068,688	\$ 5,195,904	\$ 2,916,305	\$ 11,799,795
FY16 Earned Tuition Increase	\$ 1,374,248	\$ 643,324	\$ 967,971	\$ 1,218,304	\$ 5,923,330	\$ 3,324,587	\$ 13,451,766
FY17 Earned Tuition Increase	\$ 1,566,643	\$ 733,390	\$ 1,103,487	\$ 1,388,867	\$ 6,752,597	\$ 3,790,029	\$ 15,335,013
FY18 Earned Tuition Increase	\$ 1,785,973	\$ 836,064	\$ 1,257,975	\$ 1,583,308	\$ 7,697,960	\$ 4,320,634	\$ 17,481,915
Adjustment	0	0	0	0	0	0	0
Base Funding	\$ 27,100,920	\$ 13,662,550	\$ 20,935,959	\$ 24,510,391	\$ 115,639,726	\$ 67,951,572	\$ 269,801,118
Univ. Gen. Funds as % of Univ. Base Funding	38.7%	42.9%	43.9%	40.2%	38.4%	40.6%	39.8%
Univ. Base Funding as % of Total Base Funding	10.0%	5.1%	7.8%	9.1%	42.9%	25.2%	100.0%
Per Student FTE Resources							
Fall 2010 <u>Resident</u> State-Support Student FTE	1,662	832	1,141	1,088	6,017	3,716	14,456
FY18 General funds per Resident State-Support Student FTE	\$ 6,310	\$ 7,052	\$ 8,051	\$ 9,047	\$ 7,374	\$ 7,422	\$ 7,425
Fall 2010 <u>State-Support</u> Student FTE	2,176	1,097	1,681	1,968	9,285	5,456	21,663
FY12 Base Funding per State-Support Student FTE	\$ 7,255	\$ 11,112	\$ 10,259	\$ 10,789	\$ 8,038	\$ 9,387	\$ 8,877
FY13 Base Funding per State-Support Student FTE	\$ 7,941	\$ 11,168	\$ 10,460	\$ 10,890	\$ 8,592	\$ 9,724	\$ 9,296
FY14 Base Funding per State-Support Student FTE	\$ 8,688	\$ 11,280	\$ 10,716	\$ 11,049	\$ 9,207	\$ 10,119	\$ 9,774
FY15 Base Funding per State-Support Student FTE	\$ 9,502	\$ 11,455	\$ 11,035	\$ 11,276	\$ 9,890	\$ 10,580	\$ 10,319
FY16 Base Funding per State-Support Student FTE	\$ 10,393	\$ 11,702	\$ 11,424	\$ 11,578	\$ 10,651	\$ 11,116	\$ 10,940
FY17 Base Funding per State-Support Student FTE	\$ 11,374	\$ 12,032	\$ 11,893	\$ 11,967	\$ 11,502	\$ 11,736	\$ 11,647
FY18 Base Funding per State-Support Student FTE	\$ 12,454	\$ 12,454	\$ 12,454	\$ 12,454	\$ 12,454	\$ 12,454	\$ 12,454

Shown at the lower part of Tables 16 through 21 are base funding per state support student FTE for each university, year by year through the simulation period. Thus, Table 21 has these ratios for each year of the simulation, FY13 through FY18 (six fiscal years), and the base year, FY12. All universities experienced base funding growth over the simulation and realize growth in base funding per state-support tuition student FTE, under the assumption of constant enrollment and 14.0 percent annual tuition increases.

Again, because of the design of this simulation, the FY18 base funding per state-support student FTE is equal across the six universities and for the university system at \$12,454 (see Table 21, FY18 Base Funding per State-Support Student FTE row). The base funding per state-support student FTE, FY11 to FY18, for each university, is shown in Figure 6.



Under the assumption of constant enrollment and enrollment mix, in FY18, the year all universities are financially independent under this indicator of horizontal equity, each university's proportion of total base funding equals the proportion of student FTEs served. These data in reverse rank order are:

- DSU has 5.1 percent of the sum of base funding and serves 5.1 percent of the student FTEs;
- NSU has 7.8 percent of the sum of base funding and serves 7.8 percent of the student FTEs;

- SDSMT has 9.1 percent of the sum of base funding and serves 9.1 percent of the student FTEs;
- BHSU has 10.0 percent of the sum of base funding and serves 10.0 percent of the student FTEs;
- USD has 25.2 percent of the sum of base funding and serves 25.2 percent of the student FTEs; and
- SDSU has 42.9 percent of the sum of base funding and serves 42.9 percent of the state-support tuition student FTEs.

Summary.

The simulation analysis demonstrated the use of tuition increases as a policy tool to achieve financial independence among the six South Dakota public universities under University Managed Resources (UMR) within an overall environment of funding stability guided by horizontal equity, a concept from the economics of public finance that all entities of the same or similar situation are treated similarly. Vertical equity was not considered as guidance for the analysis. Guidance from the concept of vertical equity may provide rationale for, and explanations of, differences among the universities in base funding per student FTE.

The virtues of UMR (i.e funding simplicity, alignment of performance and revenues, and a direct incentive to minimize costs) require financial independence among the six South Dakota public universities. The implementation of UMR in FY11, holding each university's base funding harmless, necessitated the reallocation of state general funds from SDSU and USD to the other universities. In FY12 to provide each university with the base tuition of FY11 and the increase in tuition revenues from the FY12 tuition increase of 14.5 percent under UMR, while fairly proportioning the 10.0 percent cut in state general funds among the universities, necessitated the reallocation of state general funds from BHSU and SDSU to the other four public universities. Both of these actions violated the principle of financial independence.

Financial independence (i.e. no transfer of funds from any university to any other university, year to year) is a necessary condition to fully capture all benefits of UMR.

General funds as a percent of base funding, general funds per resident state-support tuition student FTE, and base funding per state-support tuition student FTE are the three indicators of horizontal equity analyzed. While an increase in state general funds will enable financial independence, such was not modeled because of the assumed low probability of this occurring. An annual increase in tuition of 14.0 percent, all other things being equal, was simulated to achieve financial independence. The selection of this parameter drew from the FY12 tuition and mandatory fee increase of 6.9 percent which included a 14.5 percent tuition increase and a mandatory fee increase that ranged between 0.2 percent and 0.3 percent among the six universities.

The simulations provided funding stability and nominal growth in university base funding and base funding per state-support student FTE while adjustments (i.e. subsidies) from BHSU and

SDSU, funded by their respective tuition revenues, to the other four public universities were reduced over the simulation period.

Financial independence was achieved in FY16 (four fiscal years) with general funds as the same percent of university base funding as the indicator of horizontal equity and in FY18 for the equal general funds per resident state-support tuition student FTE and equal base funding per state-support tuition student FTE as the indicators of horizontal equity. For each of the three indicators of horizontal equity simulated, achieving financial independence also realized a convergence of base funding per state-support student FTE among the six universities (see Figures 4, 5 and 6).

Applying the concept of vertical equity as a guide to provide rationale for, and explanations of, variations in base funding among universities would be a worthwhile follow-up study.

FOOTNOTES

*By Michael Holbeck and David L. Chicoine, South Dakota State University. All errors and omissions are the sole responsibility of the authors.

1. The USD fall 2010 state-support FTE without the School of Medicine FTE was calculated by subtracting the School of Medicine fall 2010 FTE of 242.7 (see, Fall 2010 Enrollment South Dakota Public and Private Colleges and Universities p. 9) from the Total USD FTE of 5,699 (see, Fiscal Year 2010 Fact Book; p. 11); i.e. 5,699 less 242.7 equals 5,456 (rounded).

2. Online self-support credit hours taken by on-campus students were not included in the analysis. Although these credits are taken by on-campus students, the students pay self-support tuition rates. By definition, self-support tuition is to cover the cost of the course without support from state general funds. If online self-support credit hours taken by on-campus students are included in the general funds per resident state-support tuition student FTE and the base funding per state-support tuition student FTE horizontal equity indicators, then universities with large numbers of on campus students taking online credits would receive additional base general funds because of these self-support credit hours. Adjusting general funds based on self-support credit hours would be inconsistent with the definition of self-support tuition funded courses.

3. The resident state-support student FTEs used in the analyses were estimated for each university using data from the SD BOR website (<http://www.sdbor.edu/mediapubs/documents/fall2010.pdf>) and the FY11 SD BOR Fact Book. First, the fall 2010 state-support student FTEs were computed by subtracting the School of Medicine fall 2010 state-support student FTEs from the total fall 2010 state-support student FTEs. Next, the fall 2010 resident percentage of FTEs based on total enrollment was determined. The total resident FTEs (less School of Medicine resident student FTEs) were divided by the total FTEs (less School of Medicine total student FTEs). Finally, the fall 2010 state-support student FTEs were multiplied by the fall 2010 resident percentage of student FTEs based on total enrollment to estimate the fall 2010 resident state-support student FTEs for each university. This estimation was used because resident state-support student FTEs were not available from a secondary source. An example calculation for BHSU is:

Fall 2010 State-Support Resident FTE Estimation = (Fall 2010 State-Support Student FTE – Medical School Fall 2010 State-Support FTE) x [(Total Resident FTE – Total Medical School Resident FTE)/(Total FTE-Total Medical School FTE)]

BHSU Fall 2010 State-Support Resident FTE Estimation= (2,176 – 0) x [(2,477-0)/(3,242-0)] = 2,176*76.4%= 1,662

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