



To: Thomas Sanford, Assistant Commissioner of Operations, Minnesota Office of Higher Education
Julie Gordon, Interim Vice President for Finance and Administration, Universities of Wisconsin

From: Brian Prescott, President, NCHEMS

Date: February 21, 2025

Subject: MN-WI Reciprocity Program Items 3-4

Since the Minnesota-Wisconsin tuition reciprocity agreement began in 1969, there have been several iterations of the underlying agreement. Initially, the agreement was limited to the number of seats and institutions that could participate. Later, in the 1970s, the program expanded to include all institutions (MOHE, 2024). The expanded MN-WI reciprocity agreement allowed residents of either state to attend institutions in the other state at in-state rates. Over time, more Wisconsin students took advantage of the program, while Minnesota students used it less frequently. Consequently, Wisconsin eventually had to make payments to compensate the state of Minnesota for education expenses incurred. In 2007, the agreement was again modified to include a surcharge for Minnesota residents attending Wisconsin schools. The 2007 agreement also included specific academic degree program rules and exceptions.

Interestingly, the MN-WI tuition reciprocity agreement coincided with the passage of an income tax reciprocity agreement in 1969. Like the tuition reciprocity agreement, Wisconsin residents began to benefit more from the program than Minnesota residents. Furthermore, as with the tuition agreement, Minnesota eventually asked Wisconsin to make additional payments to Minnesota (Minnesota Revenue, 2002). Minnesota eventually ended the income tax reciprocity agreement in 2010 (Lehr, 2024). The parallel history of the two agreements helps illustrate the two states' close relationship, as well as how economic and demographic changes in Minnesota and Wisconsin put pressure on different interstate agreements.

Problem

The MN-WI reciprocity agreement includes a clause requiring the two states to identify an independent arbitrator to resolve any differences between them related to the results of the calculation or to any other aspect of the agreement that may be in dispute. In May 2023, having found themselves questioning a significant and abrupt change in the magnitude and the direction of the net payment obligation of one state to the other, the two states jointly engaged the National Center for Higher Education Management Systems (NCHEMS) to arbitrate the matter. The resulting scope of work involved four tasks. The first two requested that NCHEMS determine the net payment obligation for the fiscal year in dispute and recommend a way to calculate the obligation temporarily until a new methodology could be adopted by the two states. The third and fourth tasks requested that NCHEMS propose a new methodology and suggest a solution to





changes in Wisconsin's postsecondary structure, where the previously independent University of Wisconsin (UW) Colleges were integrated into regional campuses of the UW system. Having addressed the first two tasks in an earlier memo, this memo addresses the latter two tasks.

As further background, for most of the agreement's history, the net payment obligation calculations were performed by the University of Wisconsin's System Administration (UWSA) based on a set of algorithms embedded in now obsolete code run on a mainframe computer that was decommissioned in 2019. In any case, it would be very expensive to replicate the algorithms using modern technology and may not be possible. In addition, the Wisconsin legislature recently reassigned oversight over the reciprocity agreement from the Higher Education Aids Board to UWSA.

Given these circumstances, it is timely that the two states review the methodology underlying the calculation of net payment obligations. Whether the states decide to renegotiate the 2007 agreement, by redefining the calculation of the marginal cost rates that sit at the heart of it or by making more sweeping changes, is an option for both states to consider, even if it is perhaps not the most preferred one. Adjustments can also be made to the annual agreements that provide specificity to the operation of the program.

To carry out the assignment, NCHEMS undertook the following activities:

1. Literature review: NCHEMS reviewed programmatic information and literature to determine the degree to which there exist other, similar reciprocity agreements. The goal of this effort was primarily to determine if any similar agreements that may exist used methodologies that would be useful in updating the one at the center of the MN-WI agreement.
2. Setting principles: NCHEMS developed a set of principles to guide the development and adoption of a new methodology for the agreement.
3. Analyses: NCHEMS conducted analyses to generate results and to ascertain the suitability of a new methodology for use going forward.

Literature Review

Before proposing new options, it was pertinent to understand if other states have similar or alternative reciprocity exchange models. A review of available programs and related literature sought to examine the various types of tuition reciprocity agreements and identify interstate arrangements comparable to the Minnesota-Wisconsin tuition reciprocity agreement. The bottom line is that the MN-WI agreement is unique in its structure as a bilateral state agreement with a compensation formula. Other than the Minnesota-North Dakota agreement, no other arrangements directly compare.





Despite the lack of comparable models, a review of other types of tuition reciprocity agreements can be helpful. Generally, states are involved in three main types of bilateral or interstate tuition reciprocity programs. The first type involves an agreement between states to allow tuition reciprocity for all institutions and financial compensation if there is an imbalance in enrollment or expenditures. The Minnesota-Wisconsin agreement is an example of this type of agreement. The second type is an interstate agreement that includes a select group of institutions and often only applies to geographic areas near state borders. In this second type, the states consider out-of-state students as in-state students, and the states do not exchange any compensation. Finally, the third and most popular type of agreement is the multi-state agreement facilitated through an interstate compact. There are other tuition discount programs similar to the three major types, but they may only involve two institutions or may not involve states. Details and examples of these three main types are provided in Appendix A.

Principles

The NCHEMS approach to developing a process for calculating marginal costs is guided by the following principles:

1. There is no intent to make major modifications to the agreement between the states (most recently renewed in 2007). However, NCHEMS will consider proposing changes to the computation of the net state reimbursement obligation and to the definition of marginal costs as being 64% of total costs, both of which are specified in that agreement.
2. The methodology adopted should be conceptually sound, as well as simple to understand and explain.
3. Neither state should receive an advantage from the methodology.
4. Data used in the calculation should be as recent as can be reasonably acquired.
5. Both states should be able to calculate the net state reimbursement obligation. The calculation should not depend on data that are available to only one party. Furthermore, it should allow the parties to calculate the net state reimbursement obligation independently and arrive at the same answer using available data.
6. The methodology should apply to all institutions/institution types, and it should reflect the reality that different institutions/institution types have different cost structures. Therefore, the methodology should yield cost differentials that vary by institution/institution type.
7. There is no expectation that the methodology will be sensitive to cost differences across disciplines.

The consolidation of the UW Colleges into their respective UW institutions was completed in 2018. Initially, there was a question as to whether these intervening six years was enough time for the colleges to become sufficiently absorbed into the corresponding comprehensive institutions. If so, there is not a need to separate out the usage of those formerly independent institutions by reciprocity students. That is, in the calculation of the net state reimbursement obligation, enrollees





in a formerly separate UW College can be treated as enrollees at the associated four-year institution. To the extent that students do enroll in colleges that have not been absorbed into four-year institutions, it is further assumed that the numbers will be so small as not to be material in any transfer payment calculations.

NCHEMS proposed making these assumptions to UWSA representatives, who agreed that they were reasonable and that no additional calculations would be necessary; the need to separate out these enrollments in the data would violate principles for simplicity and understandability, as well as for ensuring that both parties could separately run the methodology and arrive at the same result.

Calculating Marginal Costs

A central element of the existing agreement is the calculation of the marginal costs of educating students from the reciprocating state. The agreement specifies that:

Variable costs are that portion of total student costs which vary with changes in enrollment. For purposes of this agreement, the variable cost shall be mutually agreed upon by both states' examination of cost data. The agreed upon variable cost will be 64 percent of total student costs.

For purposes of clarity of language, marginal cost is considered to be total variable costs divided by full-time equivalent (FTE) students—that is, the variable cost associated with the addition of one more student. Yet the details about how that 64% value was calculated were not recorded or found during this project. Consequently, an important part of the assignment is to determine what the marginal cost rate or rates should be.

The central questions then are:

- a) How to calculate total student costs?
- b) How to justify the 64% marginal cost rate? Alternatively, what other value that has a conceptually sound empirical basis should be used?

Allen and Brinkman¹ identified three potential approaches to calculating marginal costs:

1. The regression method.
2. Fixed and variable cost method.
3. The incremental cost method.

Each of these is briefly described below.

¹ Allen, R. & Brinkman, P. (1983). *Marginal Costing Techniques for Higher Education*. Boulder, CO: NCHEMS. Retrieved at <https://files.eric.ed.gov/fulltext/ED246816.pdf>.





The Regression Method

This method uses ordinary least squares regression expressing total costs as a function of output (in this case FTE students or annual school credit hours [SCH] produced).

$$Y = a + bX$$

Where Y is total costs, a equals fixed costs, and X equals the level of outputs (in this case SCH produced or FTE students served).

When plotted as Y versus X, a is the intercept of the Y axis and b is the slope of the regression line—indicating the change in total costs for each additional student (the marginal cost).

Fixed and Variable Cost Method

The fixed- and variable-cost method for estimating marginal costs requires the classification of all the different categories of expenditures of an institution as either fixed or variable costs. When this process is complete, the costs that do vary with enrollment can be summed and defined as total variable costs. Average variable cost, that is, total variable cost divided by output (FTE or SCH) can be used as an estimate of marginal cost. The marginal cost rate (the equivalent of 64%) is calculated as variable costs divided by total costs (fixed costs + variable costs).

Incremental Cost Method

According to Allen and Brinkman:

The incremental method estimates directly the cost behavior related to changes in volume at a single institution or its subunit. Each annual change in total costs is assessed to determine if it is most appropriately associated with changes in volume, with changes in the environment, or with specific decision factors. Cost differentials associated with environmental or decision factors are removed from the analysis, and the residual is divided by the change in volume (that is, in the number of students, credit hours, and so on). The result of this calculation can be used as an estimate of the marginal costs of additional students within the range of volume changes.

Ultimately, then, the informational and analytical requirements of the incremental method can be seen to be large and complex. It is necessary to do three things: (1) define outputs and activities to be costed, (2) collect output and activity data as well as expenditure data for each relevant unit, and (3) determine the *reasons* for changes in the expenditure levels.

NCHEMS recommends against this approach due to its focus on a single institution rather than multiple or categories of institutions, and its heavy reliance on extensive data, which makes it





impractical to determine consistent marginal cost rates or net payment obligations among states. It is not consistent with the principles established for an acceptable approach.

NCHEMS Analyses

To ensure that data acquisition costs are minimized and that all parties have ready access to data on which the calculations are based, NCHEMS proposes that the calculations be based on IPEDS data. If necessary to obtain data more recent than that available from IPEDS, IPEDS definitions can be used as the basis for requesting more recent data from Office of Higher Education and UWSA. Additionally, while NCHEMS considered other measures of costs on which to calculate a marginal cost (as will be described), ultimately it makes most conceptual sense to define the subset of institutional costs to use as Instruction + Student Services + the amount of Academic Support that is proportional to instruction's share of the sum of expenditures on instruction, research, and public service (the so-called tripartite mission of higher education). This measure accounts for the direct costs of teaching and learning, as well as the necessary student services and academic supports that must grow with increases in enrollment. The elimination of the portions of academic support most associated with research and public service focuses the cost calculation on the cost burden added by incoming reciprocity students. Finally, for purposes of the agreement, it is necessary to calculate total student costs by student level, undergraduate and graduate.

Results of Regression Analyses

NCHEMS ran multiple regression models to assess marginal costs using IPEDS data, which was necessary to generate a sufficient number of observations. The models took two primary forms:

- a) $Exp = \alpha + \beta_{fte} + \gamma_i X_j$
- b) $Exp = \alpha + \beta_{ufte} + \delta_{gfte} + \gamma_i X_j$

The difference between them is that model A included total FTE as the primary independent variable and model B produced separate coefficients for undergraduate and graduate FTE. In both models, α represents the y-intercept, β and δ are coefficients on the independent variables of interest, and $\gamma_i X_j$ is a vector of fixed effects. Models were run for various groups of expenditures, including total expenditures; instructional expenditures alone; the sum of expenditures on instruction, student services, and academic support; and the sum of expenditures on instruction, student services, and instruction's share of academic support. The models were also run with varying fixed effects designed to control for changes in the dependent variable that may be attributable to the year, the state in which each institution is located, and the institution's sector. Every combination of this mix of fixed effects was run as a separate model.





Results showed that many of these models explained a significant amount of the variation in the dependent variable. Typically, the y-intercept was not statistically significant in any of the models that included state fixed effects as well as any of the models that separately estimated undergraduate and graduate FTE. Coefficients on the FTE variables were uniformly significant, but the results were difficult to interpret. A common set of results is displayed in the table below, which comes from a regression on expenditures on instruction, student services, and instruction's share of academic support and includes state and sector fixed effects.

Parameter	Coefficient	Standard Error	Significance
Intercept	10,229,283	18,877,153	.588
Undergraduate FTE	8,666	257	.000
Graduate FTE	68,492	1,055	.000

Adjusted R^2 = .831

This indicates that each undergraduate student costs \$8,666 and each graduate student costs \$68,492. This suggests graduate students cost about 12 times more than undergraduates, a ratio that generally holds for the other models that included them separately. This relationship is implausibly large. Furthermore, it is unclear what to do with these coefficients. Two options exist: simply multiply by the number of FTE students who participate in reciprocity or construct a marginal cost rate with them. In the latter case, it is not perfectly clear what to compare them to. One option is to compare them to the value of the dependent variable, but the coefficient for graduate students is *more* than the value for those expenses. The problem with the former is that it is not obvious how to account for the varying costs for the sectors such that the coefficient for undergraduates in public research universities should be expected to be greater than for other sectors.

More and deeper analysis may be able to uncover a viable approach to estimating the marginal cost using this method. But even so, the complexity of the conceptualization and interpretation of the model violates principles related to transparency and straightforwardness in calculations.

Results of Fixed and Variable Cost Analyses

Although the specifics of the calculation of the 64% marginal cost rate remain unclear, this approach otherwise borrows substantially from the calculations that Minnesota and Wisconsin have historically used, once the marginal cost rate is determined and used to create a cost differential by credit hour for participating students. The steps are as follows:

1. Using IPEDS data on the universe of public institutions, calculate the ratio of the sum of instruction, student support services, and instruction's share of academic support





(hereafter labeled “I,SS,iAS”) to total expenditures less hospital operations, independent operations, and scholarships and fellowships.

2. Adjust monetary variables for inflation using HECA.
3. Average that ratio for the year in question and the two preceding years. Using a three-year average reduces volatility in the data from one year to the next.
4. Assume that graduate education is three times as costly as undergraduate education. Not only is this ratio similar to those used in the calculation of cost differentials under the preexisting methodology used by Minnesota and Wisconsin, it is also a ratio that has empirical support in studies that span multiple decades—Allen and Brinkman found this ratio to be valid in the early 1980s while Baum and Kurose found it to still be valid thirty years later.²
5. Calculate the marginal cost rate for each sector for the nation’s public institutions.
6. Apply the marginal cost rate to the following equations:
 - a. $3x + x = wy$, where w is the ratio of I,SS,iAS to total expenditures less hospitals, independent operations, and scholarships and fellowships, y is the amount of total expenditures less hospitals, independent operations, and scholarships and fellowships and x is the marginal cost for undergraduate instruction.
 - b. Substitute the marginal cost rate and total costs for w and y .
 - c. Solve for x , which gives the cost differential for full-time undergraduates.
 - d. Divide this amount for full-time undergraduates by 24 to get a per-SCH amount.
 - e. Multiply x by 3, which gives you the cost differential for full-time graduate students.
7. Multiply the sector-specific cost differential amounts by the number of semester credit hours consumed by reciprocity participants.

A more detailed description of these calculations is provided in Appendix B.

The results break down this way for Minnesota and Wisconsin, using the FY21 data NCHEMS originally used for the first part of this engagement.

² Allen & Brinkman; Baum, S. & Kurose, C. (2013). “Community Colleges in Context: Exploring Finances of Two- and Four-Year Institutions” in *The Century Foundation Task Force on Preventing Community Colleges from Becoming Separate and Unequal*. The Century Foundation Press.





Variable	Research Extensive	Comprehensive	Two-Year
Total Expenditures	\$53,008	\$32,274	\$14,841
I,SS,iAS	\$22,355	\$17,462	\$10,021
Marginal Cost Rate	42.2%	54.1%	67.5%
Undergraduate Cost Differential per SCH	\$233	\$182	\$104
Graduate Cost Differential per SCH	\$699	\$546	N/A

Plugged into the FY21 data provided for parts 1-2 of this engagement, these cost differentials determine the net payment obligation would be for Wisconsin to pay Minnesota a total of \$2,039,738. The table below shows the calculations for all the Wisconsin institutions, followed by those for the Minnesota institutions.

	Students	Credits	Tuition Paid	Cost Differential	Cost Differential Amount	Excess Tuition
U of WI-Madison Undergraduate	6,063	77,711	\$36,636,879	\$233	\$18,106,663	\$18,530,216
U of WI-Madison Graduate	368	4,443	\$3,667,239	\$699	\$3,105,657	\$561,582
U of WI-Milwaukee Undergraduate	522	6,644	\$2,821,203	\$233	\$1,548,052	\$1,273,151
U of WI-Milwaukee Graduate	81	679	\$467,716	\$699	\$474,621	-\$6,905
U of WI-Green Bay Undergraduate	109	1,284	\$341,711	\$182	\$233,688	\$108,023
U of WI-Green Bay Graduate	6	32	\$13,337	\$546	\$17,472	-\$4,135
U of WI-Stout Undergraduate	3,820	44,542	\$11,686,945	\$182	\$8,106,644	\$3,580,301
U of WI-Stout Graduate	110	942	\$433,414	\$546	\$514,332	-\$80,918
U of WI-Eau Claire Undergraduate	6,271	77,208	\$17,674,101	\$182	\$14,051,856	\$3,622,245
U of WI-Eau Claire Graduate	87	659	\$308,969	\$546	\$359,814	-\$50,845
U of WI-LaCrosse Undergraduate	2,878	36,508	\$9,688,882	\$182	\$6,644,456	\$3,044,426
U of WI-LaCrosse Graduate	317	3,417	\$1,260,355	\$546	\$1,865,682	-\$605,327
U of WI-Oshkosh Undergraduate	73	1,290	\$256,669	\$182	\$234,780	\$21,889
U of WI-Oshkosh Graduate	0	0	\$0	\$546	\$0	\$0
U of WI-Platteville Undergraduate	235	3,181	\$820,875	\$182	\$578,942	\$241,933
U of WI-Platteville Graduate	0	0	\$0	\$546	\$0	\$0
U of WI-River Falls Undergraduate	5,627	71,805	\$18,638,022	\$182	\$13,068,510	\$5,569,512
U of WI-River Falls Graduate	244	1,363	\$755,057	\$546	\$744,198	\$10,859
U of WI-Stevens Point Undergraduate	527	6,714	\$1,717,587	\$182	\$1,221,948	\$495,639
U of WI-Stevens Point Graduate	36	287	\$172,558	\$546	\$156,702	\$15,856
U of WI-Superior Undergraduate	1,250	17,228	\$4,247,987	\$182	\$3,135,405	\$1,112,582
U of WI-Superior Graduate	76	657	\$330,919	\$546	\$358,722	-\$27,803
U of WI-Whitewater Undergraduate	99	1,260	\$328,988	\$182	\$229,320	\$99,668
U of WI-Whitewater Graduate	3	21	\$5,919	\$546	\$11,466	-\$5,547
U of WI-Parkside Undergraduate	15	210	\$51,481	\$182	\$38,220	\$13,261
U of WI-Parkside Graduate	0	0	\$0	\$546	\$0	\$0
						\$37,519,664





	Students	Credits	Tuition Paid	Cost Differential	Cost Differential Amount	Excess Tuition
Riverland Community College	0	0	\$0	\$104	\$0	\$0
Bemidji State University Undergrad	20	196	\$53,213	\$182	\$35,672	\$17,541
Bemidji State University Graduate	2	33	\$14,690	\$546	\$18,018	-\$3,328
Central Lakes College	0	0	\$0	\$104	\$0	\$0
Vermilion Community College	21	215	\$45,032	\$104	\$22,360	\$22,672
MN State Cmty & Tech College	34	376	\$70,065	\$104	\$39,104	\$30,961
Lake Superior College	224	2,147	\$360,231	\$104	\$223,236	\$136,995
Hibbing Community College	5	41	\$8,502	\$104	\$4,264	\$4,238
Itasca Community College	14	183	\$36,396	\$104	\$19,032	\$17,364
MN State Univ, Mankato Undergrad	1,571	20,924	\$5,273,181	\$182	\$3,808,168	\$1,465,013
MN State Univ, Mankato Graduate	45	336	\$149,218	\$546	\$183,456	-\$34,238
Fond du Lac Tribal & Cmty College	0	0	\$0	\$104	\$0	\$0
Mesabi Range Cmty & Tech College	9	133	\$25,728	\$104	\$13,832	\$11,896
Minneapolis Cmty & Tech College	40	384	\$70,394	\$104	\$39,936	\$30,458
MN State Univ Moorhead Undergrad	176	2,181	\$546,910	\$182	\$396,942	\$149,968
MN State Univ Moorhead Graduate	28	169	\$76,740	\$546	\$92,274	-\$15,534
Rochester Cmty & Tech College	4	23	\$4,532	\$104	\$2,392	\$2,140
St Cloud State Univ Undergraduate	560	7,229	\$1,870,932	\$182	\$1,315,678	\$555,254
St Cloud State Univ graduate	70	523	\$256,646	\$546	\$285,558	-\$28,912
University of MN-TC Undergrad	7,469	106,634	\$46,140,939	\$233	\$24,845,636	\$21,295,304
University of MN-TC Law	0	0	\$0	\$699	\$0	\$0
University of MN-TC Graduate	934	10,835	\$9,870,778	\$699	\$7,573,665	\$2,297,113
University of MN-Duluth Undergrad	1,715	23,867	\$9,554,004	\$182	\$4,343,794	\$5,210,210
University of MN-Duluth Graduate	123	1,461	\$1,216,205	\$546	\$797,488	\$418,717
University of MN-Morris Undergrad	43	616	\$248,850	\$182	\$112,112	\$136,738
Ridgewater College	5	39	\$7,325	\$104	\$4,056	\$3,269
Winona State University Undergrad	3,130	41,018	\$10,780,881	\$182	\$7,465,276	\$3,315,605
Winona State University Graduate	168	1,068	\$588,385	\$546	\$583,128	\$5,257
MN West Cmty & Tech College	35	196	\$38,745	\$104	\$20,358	\$18,387
Anoka-Ramsey Community College	0	0	\$0	\$104	\$0	\$0
Normandale Community College	4	26	\$4,884	\$104	\$2,704	\$2,180
Century College	28	273	\$51,224	\$104	\$28,392	\$22,832
Inver Hills Community College	0	0	\$0	\$104	\$0	\$0
North Hennipen Community College	0	0	\$0	\$104	\$0	\$0
Univ of MN-Crookston Undergrad	156	1,606	\$592,833	\$182	\$292,292	\$300,541
Southwest MN State Univ Undergrad	25	289	\$75,142	\$182	\$52,598	\$22,544
Southwest MN State Univ Graduate	2	18	\$8,753	\$546	\$9,828	-\$1,076
Northland Cmty & Tech College	6	84	\$15,663	\$104	\$8,736	\$6,927
Rainy River Community College	2	38	\$8,140	\$104	\$3,952	\$4,188
Metro State Univ Undergraduate	62	604	\$172,863	\$182	\$109,928	\$62,935
Metro State Univ Graduate	16	44	\$19,788	\$546	\$24,024	-\$4,236
						\$35,479,926

This method results in significantly lower cost differentials for the research universities, and very slightly higher differentials for the other two sectors, than the prior method. Changing to a flat marginal cost rate of 64% makes a significant difference in the total columns, but because it does





so more or less evenly for the two states, it yields a result that is not much different in total magnitude: Wisconsin would owe Minnesota \$1,661,150 using that approach.³

At your request, we also ran out the results of these calculations for FY23 data supplied in the last week. The results are presented in the tables below, again with Wisconsin institutions first.

	Students	Credits	Tuition Paid	Cost Differential	Cost Differential Amount	Excess Tuition
U of WI-Madison Undergraduate	6,627	86,555	\$43,161,511	\$252	\$21,811,860	\$21,349,651
U of WI-Madison Graduate	343	4,217	\$3,797,608	\$756	\$3,188,052	\$609,556
U of WI-Milwaukee Undergraduate	99	1,184	\$529,606	\$252	\$298,368	\$231,238
U of WI-Milwaukee Graduate	30	261	\$212,092	\$756	\$197,316	\$14,776
U of WI-Green Bay Undergraduate	101	1,258	\$380,361	\$197	\$247,826	\$132,535
U of WI-Green Bay Graduate	7	74	\$39,220	\$591	\$43,734	-\$4,514
U of WI-Stout Undergraduate	4,064	46,259	\$13,945,237	\$197	\$9,113,023	\$4,832,214
U of WI-Stout Graduate	95	844	\$443,307	\$591	\$498,804	-\$55,497
U of WI-Eau Claire Undergraduate	5,842	71,284	\$19,416,368	\$197	\$14,042,948	\$5,373,420
U of WI-Eau Claire Graduate	73	556	\$317,993	\$591	\$328,596	-\$10,603
U of WI-LaCrosse Undergraduate	2,911	36,936	\$11,349,442	\$197	\$7,276,392	\$4,073,050
U of WI-LaCrosse Graduate	319	3,404	\$1,373,355	\$591	\$2,011,764	-\$638,409
U of WI-Oshkosh Undergraduate	59	757	\$233,112	\$197	\$149,129	\$83,983
U of WI-Oshkosh Graduate	0	0	\$0	\$591	\$0	\$0
U of WI-Platteville Undergraduate	250	3,320	\$997,947	\$197	\$654,040	\$343,907
U of WI-Platteville Graduate	0	0	\$0	\$591	\$0	\$0
U of WI-River Falls Undergraduate	4,529	56,672	\$17,042,413	\$197	\$11,164,384	\$5,878,029
U of WI-River Falls Graduate	182	1,083	\$682,389	\$591	\$640,053	\$42,336
U of WI-Stevens Point Undergraduate	619	7,897	\$2,324,752	\$197	\$1,555,709	\$769,043
U of WI-Stevens Point Graduate	17	138	\$102,840	\$591	\$81,558	\$21,282
U of WI-Superior Undergraduate	938	12,625	\$3,518,891	\$197	\$2,487,125	\$1,031,766
U of WI-Superior Graduate	35	237	\$180,622	\$591	\$140,067	\$40,555
U of WI-Whitewater Undergraduate	94	1,254	\$384,590	\$197	\$247,038	\$137,552
U of WI-Whitewater Graduate	3	15	\$2,775	\$591	\$8,865	-\$6,090
U of WI-Parkside Undergraduate	13	163	\$48,857	\$197	\$32,111	\$16,746
U of WI-Parkside Graduate	0	0	\$0	\$591	\$0	\$0
						\$44,266,526

³ An earlier version of this memo showed a much less significant difference between the 64% flat marginal rate and a marginal rate that varies by institution type. The differences here are due primarily to adjustments to the marginal rates being assigned to UW-Milwaukee and UM-Duluth as research-intensive institutions. UM-Duluth receives much heavier use of the reciprocity policy by Wisconsin residents relative to Minnesota residents who attend UW-Milwaukee.





	Students	Credits	Tuition Paid	Cost Differential	Cost Differential Amount	Excess Tuition
Riverland Community College	0	0	\$0	\$113	\$0	\$0
Bemidji State University Undergrad	0	0	\$0	\$197	\$0	\$0
Bemidji State University Graduate	0	0	\$0	\$591	\$0	\$0
Central Lakes College	0	0	\$0	\$113	\$0	\$0
MN State Cmty & Tech College	27	323	\$65,106	\$113	\$36,499	\$28,607
Lake Superior College	71	722	\$122,931	\$113	\$81,530	\$41,401
MN North College	62	773	\$157,109	\$113	\$87,349	\$69,760
MN State Univ, Mankato Undergrad	1,306	17,349	\$4,924,019	\$197	\$3,417,753	\$1,506,266
MN State Univ, Mankato Graduate	72	545	\$276,609	\$591	\$322,095	-\$45,486
Fond du Lac Tribal & Cmty College	0	0	\$0	\$113	\$0	\$0
Minneapolis Cmty & Tech College	3	44	\$9,112	\$113	\$4,972	\$4,140
MN State Univ Moorhead Undergrad	150	1,930	\$567,376	\$197	\$380,210	\$187,166
MN State Univ Moorhead Graduate	22	139	\$76,073	\$591	\$82,149	-\$6,076
Rochester Cmty & Tech College	3	29	\$5,859	\$113	\$3,277	\$2,582
St Cloud State Univ Undergraduate	342	4,406	\$1,346,203	\$197	\$867,982	\$478,221
St Cloud State Univ graduate	55	419	\$213,021	\$591	\$247,629	-\$34,608
University of MN-TC Undergrad	7,353	105,111	\$48,045,015	\$252	\$26,487,972	\$21,557,043
University of MN-TC Law	0	0	\$0	\$756	\$0	\$0
University of MN-TC Graduate	925	10,555	\$9,845,833	\$756	\$7,979,656	\$1,866,177
University of MN-Duluth Undergrad	1,646	22,780	\$9,561,976	\$197	\$4,487,660	\$5,074,316
University of MN-Duluth Graduate	131	1,561	\$1,339,108	\$591	\$922,510	\$416,598
University of MN-Morris Undergrad	24	318	\$136,413	\$197	\$62,646	\$73,767
Ridgewater College	2	8	\$1,610	\$113	\$904	\$706
Winona State University Undergrad	2,521	32,996	\$9,364,354	\$197	\$6,500,212	\$2,864,142
Winona State University Graduate	199	1,339	\$761,762	\$591	\$791,349	-\$29,587
MN West Cmty & Tech College	24	105	\$21,576	\$113	\$11,809	\$9,768
Anoka-Ramsey Community College	0	0	\$0	\$113	\$0	\$0
Normandale Community College	7	70	\$13,331	\$113	\$7,910	\$5,421
Century College	17	187	\$35,761	\$113	\$21,131	\$14,630
Inver Hills Community College	0	0	\$0	\$113	\$0	\$0
North Hennipen Community College	0	0	\$0	\$113	\$0	\$0
Univ of MN-Crookston Undergrad	119	1,200	\$494,575	\$197	\$236,302	\$258,273
Southwest MN State Univ Undergrad	10	175	\$44,200	\$197	\$34,475	\$9,725
Southwest MN State Univ Graduate	4	30	\$14,580	\$591	\$17,730	-\$3,150
Northland Cmty & Tech College	12	194	\$42,311	\$113	\$21,866	\$20,446
Metro State Univ Undergraduate	0	0	\$0	\$197	\$0	\$0
Metro State Univ Graduate	0	0	\$0	\$591	\$0	\$0
						\$34,370,250

These results indicate that the net payment obligation from Wisconsin to Minnesota for FY23 is \$9,896,276. The results are based on a simple inflation adjustment using HECA of the cost differentials from the prior FY21 tables. We also ran the analysis by recalculating the cost differentials from scratch, and the results were substantially similar. The net obligation calculated this way was \$10,583,675.





NCHEMS also formulated another approach to calculating the net payment obligation. In this method, rather than using the sum of I,SS,iAS and total expenditures less hospital and independent operations and scholarships and fellowships, we calculated amounts for the sum of instruction and student services and for the sum of those two categories plus instruction's share of academic support and of institutional support. This approach focuses more specifically on the delivery of instruction and student services in the numerator, and leaves out research and public services in the denominator. But it reduces the cost differentials due to the much lower value of the expenditure amounts to which the marginal cost rate is applied. This reduction is greater at the public research universities, however, so the result is that the net payment obligation owed by Wisconsin to Minnesota is reduced.

Recommended Approach

Having run multiple regressions and multiple versions of the fixed and variable cost method, we recommend the variable cost method as outlined above using IPEDS data to develop a marginal cost rate with I,SS,iAS and total expenditures less the sum of hospital and independent operations and scholarships and fellowships. We further recommend the use of consistent calculations of the cost differential drawn from all institutions nationally. Doing so may yield marginal cost rates that differ from the specific amounts applicable in Minnesota and Wisconsin, but it should make for a more stable calculation by preventing significant changes in any single year in one or the other state that could potentially cause an abrupt change in the magnitude and direction of the net payment obligation. Although we did not run the numbers this way here, NCHEMS further recommends that the cost differentials be calculated as a three-year inflation-adjusted average (using HECA as the inflation adjustment) to provide further stability in the calculation.

We prefer this method to the alternative in which instruction and student services are compared to the sum of those two categories plus instruction's share of academic support and institutional support for two key reasons. First, there is judgment to be exercised in the reporting of what constitutes spending in each expenditure category in IPEDS, making a calculation involving as much of the institution's total budget as is reasonable a more objective measure. Second, while we routinely use a measure of instruction's share of academic support as a reasonable approach to isolating the costs of instruction that are embedded in academic support, we recognize that it is likely an imperfect proxy. Applying the same logic—that instructional expenses are a reasonable reflection of the priorities an institution gives instruction relative to its other components of its mission—to institutional support costs is less tested or obvious.

Although it requires a lot of arithmetic, the fixed and variable cost methodology is more transparent, easier to explain, and easier to calculate. A typical spreadsheet with appropriate documentation will be sufficient for any stakeholder to use to arrive at the same answer. All of the necessary data are readily available.



Appendix A

There are three main types of models for reciprocity.

1. Bilateral Interstate Agreement with Financial Considerations.
2. Bilateral Interstate Agreement without Financial Considerations.
3. Higher Education Compact Programs with and without Considerations.

Other types of tuition reciprocity agreements or programs exist, but they are either small in scope or are marketing-related and do not involve the states.

1. Bilateral Interstate Agreement With Financial Considerations

The first type of interstate tuition reciprocity agreement involves state legislation and payments or potential payments between two states based on a formula.

Table 1. Bilateral Interstate Agreements with Financial Considerations

Agreement	Details	Payment Details	Resource Link
Minnesota-Wisconsin	Minnesota and Wisconsin residents can attend each other's institutions at varying tuition rates. According to the Minnesota Office of Higher Education, Wisconsin students typically pay the in-state Minnesota rate. On the other hand, Minnesota students pay a rate that neither incentivizes nor disincentivizes them from attending an institution out of state.	Payments are based on the "marginal instructional costs," which are calculated to be 64% of per-student instructional costs. If the calculated marginal instructional cost is greater than the tuition paid by the student, the corresponding state is responsible for making up the difference. The state obligations are calculated for both states and a difference is calculated to understand which state owes an obligation.	MOHE Wisconsin Tuition Reciprocity Overview
Minnesota-Wisconsin (pre-2007)	Residents of either state were charged the resident tuition rate at a "comparable" institution in the state of residence. For example, Wisconsin students paid the UW-Madison tuition rate to attend UM-Twin Cities, which resulted in Wisconsin students paying less to attend	The formula resulted in higher transfer payments from Wisconsin to Minnesota to subsidize the instructional cost difference.	MOHE 2020-2021 Tuition Reciprocity Report





	UM-Twin Cities than Minnesota residents.		
Minnesota-North Dakota	According to the Minnesota Office of Higher Education (OHE), Minnesota residents pay the North Dakota in-state tuition rate plus a 12% surcharge for undergraduate programs and a 27% surcharge for graduate programs. North Dakota students pay the higher of the two in-state rates. This is the only tuition policy in Minnesota that varies based on the student's state of residency.	<p>Minnesota's obligation to North Dakota is to be lesser of the program costs for each fiscal year or the annual amount appropriated by the legislature. In exchange, North Dakota can increase the surcharge charged to Minnesota residents without Minnesota approval if Minnesota lowers its annual appropriation. Since then, Minnesota has lowered its appropriation, but it doesn't seem North Dakota has responded with an increase.</p> <p>Formula: The formula with North Dakota is similar in that a marginal cost is calculated. However, since more students from Minnesota attend institutions in North Dakota, the formula multiplies the calculated marginal costs by the gap in the FTEs who participated in the program.</p>	MN-ND Agreement
Minnesota-South Dakota (defunct)	Terminated at the end of the 2023-2024 academic year.	According to the OHE, Minnesota and South Dakota mutually agreed to waive the interstate payment rule due to the small number of residents participating in the program.	

2. Bilateral State Agreements Without Financial Consideration

The bilateral agreement without financial consideration is a type of tuition reciprocity agreement that aims to improve regional access to higher education, offer a more comprehensive range of educational programs to residents of border counties in each state, and benefit taxpayers by reducing the need to invest in expensive programs and facilities. The agreements formally involve the state in some capacity.

Table 2. Bilateral Interstate Agreements without Financial Considerations

Agreement	Details	Resource Link
Kentucky-Indiana	The eligible residents of each state enroll at the in-state rate. Based on county residence.	https://cpe.ky.gov/policies/finance/reciprocity-ky-indiana.pdf





Kentucky-Ohio	The eligible residents of each state enroll at the in-state rate. Three regional agreements. Based on county residence.	Cincinnati Metro - https://cpe.ky.gov/policies/finance/reciprocity-ohio-nku-gctc.pdf Central Kentucky - https://cpe.ky.gov/policies/finance/reciprocity-ohio-mosu-actc-mctc.pdf And https://cpe.ky.gov/policies/finance/reciprocity-ohio-mctc.pdf
Kentucky-West Virginia	The residents of each state enroll at the in-state rate. Based on county residence.	https://cpe.ky.gov/policies/finance/reciprocity-ky-westvirginia.pdf
Indiana-Ohio	The residents of specific counties enroll at the in-state rate. This agreement includes numerous program exemptions.	https://www.in.gov/che/files/OH-IN-Executed-Agreement-for-2023-2025.pdf
Ohio-West Virginia	A select number of institutions offer in-state tuition rates for select programs. All residents of the state are eligible.	https://higher.ed.ohio.gov/educators/budget-financial/tuition-fees/tuition-reciprocity-agreements/tuition-reciprocity
Colorado-New Mexico	The purpose of this Agreement is to establish a tuition reciprocity program (hereinafter referred to as the Program) to enable selected students from the State of New Mexico to enroll at designated institutions of higher education in the State of Colorado with authorization to pay Colorado resident tuition rates, and to enable an equal number of selected students from the State of Colorado to enroll at selected institutions in New Mexico with authorization to pay New Mexico resident tuition rates.	CO-NM Agreement

3. Higher Education Compact Programs With and Without Financial Considerations

The most commonly used tuition reciprocity agreement across the country is administered through state compacts. In these agreements, a fee is typically paid from the state to a compact organization rather than from state to state to operate the program. The program is usually





administered by institutions aiming to increase out-of-state enrollment and offer programs not accessible in other states. There are two compact reciprocity agreements that are more complex, involve only professional programs, and more involved in state funds' distribution. These two agreements include the Southern Regional Education Board's Regional Contract Program and the Western Interstate Commission for Higher Education (WICHE)'s Professional Student Exchange Program (PSEP).

Table 3. Higher Education Compact Programs with and without Financial Considerations

Agreement	Details	Resource Link
Midwestern Higher Education Compact	Midwestern Student Exchange Program - Discounted tuition rate for participating institutions – no more than 150% of in-state tuition students in the compact states. MHEC program includes select private institutions.	https://www.mhec.org/programs/midwest-student-exchange-program
New England Board of Higher Education	Tuition Break Program – Discounted tuition rates for participating institutions – no more than 175% of in-state tuition. Only select programs are available at some institutions. States pay a membership fee to be a part of the program.	https://nebhe.org/tuitionbreak/eligibility-faqs/
Southern Regional Education Board	Academic Common Market Program – Focused on specific programs. In-state tuition is offered to students who meet eligibility requirements. Regional Contract Program – For Professional Degrees.	https://www.sreb.org/AcademicCommonMarket
WICHE	The Western Undergraduate Exchange (WUE) - Discounted tuition rate for students within the WICHE region. Participating institutions charge only 150% of in-state tuition. Western Regional Graduate Program (WRGP) – Similar to WUE, but at the graduate level. Professional Student Exchange Program (PSEP)—To help states provide more professional education programs and opportunities to their residents, the PSEP program allows students who reside in a state where a program does not exist to enroll in another state that offers the program at the in-state tuition rate. The state where the student resides then sends compensation directly to the institution providing the education.	WUE – https://www.wiche.edu/tuition-savings/wue/ WRGP – https://www.wiche.edu/tuition-savings/wrgp/ PSEP - https://www.wiche.edu/tuition-savings/psep/





4. Additional State and Institutional Agreements Without Financial Compensation

There are other types of tuition reciprocity agreements, such as regional and border agreements that do not formally involve the state and do not include financial compensation. Almost every state in the country has some type of border agreement. These agreements usually involve regional two-year or four-year comprehensive colleges, although a few also allow students to attend a research institution. Due to the large number of these agreements and the lack of historical information, it is difficult to generalize a specific reason for the implementation of these programs or to determine how many have ended. Nevertheless, a theme amongst most the agreements is that they provide additional access and educational opportunities to residents living in predominately rural areas. Table 4 includes a short list of the numerous regional tuition agreements around the country.

Table 4. Addition Reciprocity Agreements without Financial Consideration

Agreement	Details	Resource Link
California-Nevada	The California-Nevada Interstate Attendance Agreement (CNIAA) is a program established by the California Legislature and authorizes students to be exempt from non-resident tuition if they attend Lake Tahoe Community College and reside in specific communities in the state of Nevada. LTCC is authorized under California Law to serve a maximum of 200 students (headcount) annually.	https://www.ltcc.edu/admissions/cniaa_wue.php
Michigan-Ohio	A tuition reciprocity agreement with Ohio, entered into by the Michigan State Board of Education and the Ohio Board of Regent in 1980, allows an Ohio resident to attend Eastern Michigan University at Michigan resident tuition rates. Monroe County residents can attend the University of Toledo at Ohio resident tuition rates.	https://www.emich.edu/regents/board-documents/2022/6-16-2022/tab_f_redacted.pdf
Minnesota-Iowa	There is a limited reciprocity agreement between Minnesota West Community & Technical College and Iowa Lakes Community College (with campuses in Algona, Estherville, Emmetsburg, Spencer, and Spirit Lake)	https://www.ohe.state.mn.us/mPg.cfm?pageID=124
West Virginia-Maryland	West Virginia University agrees to enroll residents of Garrett County, Maryland, as full/part-time baccalaureate degree-seeking students at resident tuition and fee rates based on criteria established by West Virginia University at the main campus in Morgantown and the Potomac State campus in Keyser.	https://provost.wvu.edu/academic-programs-and-policies/tuition-agreements





Tennessee-Multiple States (Virginia, North Carolina, and South Carolina, Alabama)	Students residing in select bordering counties in North Carolina and Virginia may attend ETSU at the in-state tuition rate, and they may be considered for certain in-state scholarships. Incoming students from non-Tennessee regional counties in North Georgia and Alabama are saving thousands of dollars with UT- Chattanooga's regional tuition rate. Participating students pay in-state tuition and receive a 50% discount off the non-resident tuition amount. (UT-Chattanooga's agreement looks to be independent from the compact agreement).	https://www.etsu.edu/financial-aid-and-scholarships/cost/cofa.php https://www.utc.edu/enrollment-management-and-student-affairs/admissions/out-of-state
Texas-Multiple Border States (Arkansas, Louisiana, New Mexico and Oklahoma)	This program provides a waiver of nonresident tuition for students from neighboring states (Arkansas, Louisiana, New Mexico and Oklahoma) enrolled in certain public institutions in Texas. Students may be from any part of the neighboring state; however, the institution must have an agreement with a similar institution in the student's home state, to allow Texas residents attending the other state's institution to pay a reduced tuition rate.	https://comptroller.texas.gov/programs/education/msp/funding/aid/state-programs/lreep.php#:~:text=This%20program%20provides%20a%20waiver,certain%20public%20institutions%20in%20Texas.
Nebraska-Colorado and other states (South Dakota and Wyoming)	Western Nebraska Community College offers in-state tuition rates for Colorado residents. Chadron, Peru and Wayne State Colleges have a "non-resident scholars program" that reduces tuition for out-of-state students.	https://www.wncc.edu/admissions-aid/tuition-fees/index
Georgia-Multiple States (Alabama, Florida, North Carolina, South Carolina, Tennessee)	Tuition waiver program for border residents. Border County Rules - The Georgia Board of Regents review and decide on which institutions and counties are eligible. Border Residents - The Chancellor of each institution reviews enrollment and has the authority to grant in-state tuition to residents in border states.	https://www.usg.edu/student_affairs/assets/student_affairs/documents/border_waivers.pdf
Washington-Oregon	The border county project designated Oregon residents living in 13 of Oregon's northern border counties as Washington residents for purposes of tuition.	https://wsac.wa.gov/sites/default/files/2015/Reciprocity.Report.pdf

International border tuition agreements exist. For example, the state of Minnesota has an agreement with Manitoba in Canada. California is currently in the process to set up a tuition reciprocity agreement with Mexico. The state of Washington previously had an agreement with British Columbia, but the agreement mutually ended.





Appendix B

A more detailed description of the calculations presented in the memo follow.

1. Organize institutions into sectors based on Carnegie Basic Classifications from 2021. We aggregated the following values into groups and applied to the institutions as follows:
 - a. Public research extensive (15) – University of Wisconsin – Madison, University of Wisconsin – Milwaukee, and University of Minnesota – Twin Cities
 - b. Public comprehensive universities (18-20, 21-23, 26, 27, 30, 31, 33) – University of Wisconsin’s campuses at Eau Claire, Green Bay, LaCrosse, Oshkosh, Parkside, Platteville, River Falls, Stevens Point, Stout, Superior, Whitewater; Duluth, Bemidji State, Mankato, Moorhead, St. Cloud State, Morris, Winona State, Crookston, Metro State.
 - c. Public two-year institutions (1-14, 23) – all others
2. Sum the following expenditures for all institutions in the IPEDS universe for each of the sectors above: instruction, student support services, and instruction’s share of academic support. This gives the amount labeled “I,SS,iAS” in the memo.
 - a. Instruction’s share of academic support is calculated by multiply academic support by the ratio of instruction expenses to the sum of instruction, research, and public service expenses.
3. Sum total expenditures, less expenditures on hospital operations, independent operations, and scholarships and fellowships, for each of the sectors above.
4. Adjust all monetary variable for inflation using HECA.
5. For each sector, calculate the ratio of I,SS,iAS from #2 to total expenditures less hospital operations, independent operations, and scholarships and fellowships from #3.
6. Average the ratio in #5 together with the ratios for the two preceding years. This gives the marginal cost rate based on national data to be used for calculating the cost differentials by sector.
7. Multiply the sector-specific marginal cost rate by national sum for total expenditures less hospital operations, independent operations, and scholarships and fellowships (from #3).
8. To get the marginal cost differential for an undergraduate student, divide the number from #7 by four, four being the divisor you get by applying the assumption (validated by research cited in #4 in the memo) that graduate education is three times as costly as undergraduate education.
9. Divide the result in #8 by 24 to get a per-credit hour cost difference for undergraduates, assuming that full-time enrollment is defined as 24 credits.
10. Multiply the result in #9 by three to get a per-credit hour cost difference for graduate students.





11. For each institution, multiply the number of semester credit hours consumed by reciprocity students by the applicable sector-based cost differential by level. This produces the value in the “Cost Differential Amount” column in the tables in the memo.
12. Subtract this cost differential amount from the “Tuition Paid” amount to get “Excess Tuition.”
13. Subtract one state’s total excess tuition from the other’s to get the Net Payment Obligation.

