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Economic Impact of North Central Michigan College

Final Report

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Introduction and Findings

This report provides an estimation of the total economic impact that North Central Michigan College (NCMC) makes on its four-county service area: Charlevoix, Cheboygan, Emmet, and Otsego Counties.

Since 1958, North Central Michigan College has been opening the door to academic success for residents by offering two-year associate degrees in the arts and sciences that are transferable to four-year universities. In addition, NCMC has paved the path to better-paying careers through its applied science programs in business, education, health science, criminal justice, information technology, and legal assistance. Equally important, NCMC provides a second chance for residents by advancing their skills, switching careers, or just getting more from life through education. NCMC offers 20 degrees and 40 certificates.

Moreover, North Central's Corporate & Community Education (CCE) has partnered with eight manufacturers in the region, training more than 540 workers and creating 40 new positions. Companies assisted by the college's CCE include Moeller Aerospace, Link Industries, Wojan Windows & Doors, JB Webb, Central Industrial, Petoskey Plastics, Tube Fab, and Honeywell. CCE also provides training in health care, safety, agriculture, business, education, hospitality, computer software, and more. Through its Ed2Go partnership, CCE offers numerous on-line professional development courses and classes especially designed to meet the needs of small businesses and future entrepreneurs. North Central Michigan College also has partnered with the Little Traverse Bay Bands of Odawa Indians to establish a Computer Numerical Controlled (CNC) lab, allowing it to offer advanced manufacturing technology programming. This is in addition to its mobile "FabLab," which allows it to provide similar training at various sites within NCMC's service area.

Finally, NCMC has partnered with Lake Superior State University and Spring Arbor University to offer one master's degree and eight bachelor's degree programs at its University Center in Petoskey.

In addition to its Petoskey campus, NCMC maintains campuses in Cheboygan and Gaylord, both in northern Michigan. The college recently started a Certificate of Development in Business Development in Cheboygan focusing on entrepreneurship and small business development. At the Gaylord location, residents can enroll in eight bachelor-degree programs, ranging from social work to Geographic Information Systems (GIS) in partnership with four-year-degree colleges and universities.

Of course, the economic impact of the college is only one measure of its importance to the greater Petoskey region. North Central Michigan College has greatly enhanced the livability of the region through programs such as its lifelong learning courses in partnership with the Petoskey District Library and the North Central Lecture Series and Luncheon Lectures which bring national and regional speakers into the region and are open to the public. Finally, its campus offers the Harris Sculpture Garden with more than 25 unique pieces of outdoor art for the public to enjoy. In short, Petoskey would not be the same place without North Central Michigan College.

This report's findings are presented in two sections. The first section presents an estimation of North Central Michigan College's economic impact. Estimating economic impact is a task that involves making valuations of the status quo compared to a counterfactual situation in which the college is absent from the region. In measuring the impact of a new facility to a region, such as a factory, the level of economic activity with the facility in full operation is compared to the level of economic activity in the region before the facility was constructed. Similarly, to measure the economic impact of an existing facility, a strictly hypothetical level of the region's economic activity without the facility must be estimated.

The second section of the report estimates the impact of North Central Michigan College on the potential earnings of its graduates. During the course of their working career, associate-degree holders in northern Michigan earn \$459,000 more than persons who only have a high school diploma. The net present value of the return on investment for a student successfully completing a two-year associate's degree, which discounts the value of future earnings, is estimated to be between \$6.87 and \$10.70 for each dollar he/she spent on tuition and foregone income while attending school. The student's return on investment depends on whether he/she receives federal aid and attends school full or part time. This is a conservative estimate as it does not factor in the unique, high-demand technical degrees that the college offers nor does it factor in the higher probability that the associate-degree holders will remain employed during their working careers.

North Central Michigan College's economic contribution is estimated by an economic simulation model especially constructed for the college's four-county service area by Regional Economic Models Incorporated (REMI). The REMI model is considered one of the best regional impact models available due to its flexibility and structure. A brief description of the model is provided in the Appendix.

NCMC's economic contribution is measured by its impact on:

- Total year-round employment in the region, both full and part time;
- Personal income of the region's full-time residents which includes earned income, such as wages and salaries, and unearned income such as pensions and dividends; note that personal income is based on where someone lives while wages are based on where someone works;
- The increase in total sales: the purchase of all goods and services in the region including purchases made by businesses to suppliers; and
- The change in the service area's Gross Regional Product (GRP).

The last measure, the region's GRP, equals the increase in the purchases of goods and services generated by NCMC minus the value of all intermediate goods and services that are either shipped or provided outside the region. For example, the purchase price of a text book would be included in total sales, while only the "mark-up" earned by the local seller is included in the GRP.

Due solely to the presence of North Central Michigan College, there are 1,470 additional jobs in the region; total sales are \$253.6 million higher; personal income is \$66.1 million greater; and the region's Gross Regional Product is \$120.2 million higher (Table 1).

Table 1 Summary of Economic Impact of North Central Michigan College

Employment	1,470
Personal income (\$ mil 2015)	66.1
Total increase in sales (\$ mil 2015)	253.6
Total increase in Regional Gross Product (\$ mil 2015)	120.2

The students attending North Central Michigan College can also expect a significant increase in their lifelong earnings.

- Individuals holding an associate's degree in Northern Michigan had a low 6.3 percent unemployment rate in 2013 (most current data available) compared to a high 12.2 percent rate for persons with only a high school degree.
- Annual earnings for associate-degree holders in Northern Michigan were \$34,000 in 2013 compared to \$22,800 for individuals with only a high school diploma.

Economic Impact

With an annual budget of nearly \$16 million in 2015, North Central Michigan College's full- and part-time faculty and staff numbered 346¹ and its enrollment reached 2,633 in the year's winter semester. The college is among the top five, year-round largest employers in Emmet County.

¹ Average quarterly employment level at the college from June 2014 to June 2015.

The full economic impact of the college is much more than its direct employment and the consumer expenditures of its students, however. Its full economic impact includes:

- The college's purchases of supplies and services from local vendors
- The consumer expenditures by its faculty and staff
- The consumer expenditures of its students
- The retention of workers and the expansion of employment opportunities generated by the region's employers taking advantage of the college's customized training programs through its Corporate & Community Education (CCE) Department.

The economic impact of North Central Michigan College centers around answering the strictly hypothetical question: What would the size of the economy in the four-county region be without NCMC?

For a grocery store or a convenience store, it is very likely that a new store would open or an existing store would expand, resulting in a very small economic impact. The store's workers and shoppers would simply transfer over to a new or expanding existing facility. On the other hand, in the case of a manufacturer, the countless number of abandoned industrial structures indicates that when a factory shuts down, there is no reason to assume that another one will take its place. The economic impact of a factory closing can be quite large.

In the analysis, we assumed that the population of Emmet County and its surrounding area is too small to support the construction of a new community college nor would an existing community college establish a substantial branch facility in the city.

In addition to assuming that neither a new community college nor a substantial branch campus would open in the region, we also assume that

1. All of the students living outside of the four-county service area who currently are attending NCMC would pursue their education elsewhere;
2. Approximately 50 percent of the student residents in the four-county area would also move to another community college location or to a four-year university or college; and
3. The training needs of the region's business community would be addressed internally by companies.

As shown in Table 2 below, the ongoing operation of North Central Michigan College—which includes the consumption expenditures of its staff and faculty, as well as the supplies and services it buys directly—generates 127 additional indirect jobs in the four-county region on top of the college's 346 year-round employees for a total employment impact of 473. The college's operations increase total sales in the four-county region by \$31.5 million annually. Since most of these sales are for goods and services that are generated outside the region, the college's impact on the region's Gross Regional Product—the value of goods and services generated in the region—is somewhat lower, at \$20.9 million. Finally, the ongoing operation of NCMC adds \$15.9 million in personal income in the region.

Table 2 Summary of Economic Impact of North Central Michigan College

Ongoing Operations	
Direct employment	346
Indirect Employment	127
Total Employment	473
Personal income (\$ mil 2015)	15.9
Total increase in sales (\$ mil 2015)	31.5
Total increase in Regional Gross Product (\$ mil 2015)	20.9
Student Expenditures	
Employment	8
Personal income (\$ mil 2015)	0.3
Total increase in sales (\$ mil 2015)	0.7
Total increase in Regional Gross Product (\$ mil 2015)	0.5
Corporate and Community Education	
Employment	989
Personal income (\$ mil 2015)	49.9
Total increase in sales (\$ mil 2015)	221.4
Total increase in Regional Gross Product (\$ mil 2015)	98.9
Total Impact	
Employment	1,470
Personal income (\$ mil 2015)	66.1
Total increase in sales (\$ mil 2015)	253.6
Total increase in Regional Gross Product (\$ mil 2015)	120.2

As shown above in Table 2, the economic impact of North Central Michigan College also includes the economic contribution of the consumption expenditures of the students who are living in the region solely because of the college. It is estimated that without NCMC in the area, the reduced numbers of students would result in a decline of approximately \$1.6 million in consumer spending, as shown in Table 3 below. This includes spending outside the region, including internet sales and credit card fees. This impact amounts to a modest increase of eight jobs, and increases of \$700,000 in total regional sales, \$300,000 in personal income, and \$500,000 in the Gross Regional Product.

According to the finding of a study prepared by Geoffrey Paulin, full-time college students spend \$3,700 per quarter.² However, roughly 70 percent of NCMC students attend the school on a part-time basis. These individuals may include working adults taking career advancement courses and/or retirees taking classes for personal enrichment as well as credential-seeking students. Since, for these individuals, attending class is not their primary activity, their consumer expenditures are excluded from estimating economic impact.³ In addition, some full-time and three-quarter-time students attending NCMC live at home with their parents and do not pay rent.

² Geoffrey D. Paulin, "Expenditures of College-Age Students and Nonstudents," *Monthly Labor Review*, July 2001, pp. 46–50. He found that in the 1996–1998 period, college students spent \$2,584 per quarter. In our calculations, we subtracted housing expenditures from this total since we assumed many NCMC students live at home and used an inflation factor of 52 percent.

³ While this step is required for this study, it is unfortunate because it neglects the importance of the college to the area's quality of life.

Table 3 provides a more detailed breakdown of the estimated decrease in consumer expenditures by NCMC students during the 2014–2015 school year than would occur if the college did not exist. Again, the impacted enrollment is the estimated number of students who would move out of the region to attend college elsewhere if NCMC did not exist or who would stop driving into the region to attend classes at NCMC.

Table 3 2014–2015 Student Enrollment and Estimated Consumption Expenditures

Semester	Total enrollment	Impacted enrollment	Estimated consumer expenditures
Summer 2014	577	141	106,475
Winter 2014	2,069	625	810,335
Spring 2015	2,053	543	673,439
	Total	\$	1,590,249

Note: Impacted enrollment includes 50 percent of in-district, full-time students and all full- and part-time students living out-of-district.

SOURCE: North Central Michigan College; calculation made by the W.E. Upjohn Institute.

Business Community Impact

North Central Michigan College is a vital economic asset for the regional business community. NCMC Career and Community Education program (CCE) has been effective in developing partnerships with the region’s manufacturers and service-producing firms. Through its activities, 40 new jobs have been generated in the four-county region and 540 jobs have been retained in 2015.⁴

The total employment contribution of NCMC’s CCE to the region in 2015 is shown below in Table 4. The impact of NCMC generated an estimated 989 jobs in the four-county region. Moreover, as shown previously in Table 2, CCE activities increased personal income by \$49.9 million and total sales by \$221.4 million.

Table 4 Employment Impact of NCMC’s Corporate & Community Education (CCE)

Jobs created	40
Jobs retained	540
Total direct jobs	580
Indirect impact	409
Total impact	989

A more detailed illustration of the college’s contribution to the region’s employment is shown in Table 5. The table breaks out both the direct impact of the college, its 346 employees, the 580 manufacturing jobs created or retained due to CCE training activity, and the resulting indirect employment impact due to these activities, as well as student expenditures. Major sectors impacted by the college include construction, retail, professional services, and health care.

⁴ <http://www.ncmich.edu/cce2/index.php/cce-highlights-2015>.

Table 5 Detailed Employment Breakdown of NCMC Indirect Impact on Employment

	Operations	Student expenditures	CCE	Total
Direct Impact	346	0	580	
Indirect Impact				
Forestry, fishing	0	0	0	0
Mining	3	0	6	9
Utilities	1	0	3	4
Construction	48	1	91	139
Manufacturing	2	0	16	18
Wholesale trade	0	0	4	5
Retail trade	19	2	60	82
Transportation and warehousing	1	0	5	6
Information	0	0	1	1
Finance and insurance	3	0	17	20
Real estate, rental and leasing	3	0	7	10
Professional, scientific, and technical	6	0	31	37
Management of companies	0	0	0	0
Administrative	4	0	26	30
Educational services	0	0	0	0
Health care and social assist	9	1	32	42
Arts, entertainment, and recreation	0	0	2	2
Accommodation and food	8	1	30	38
Other services	8	1	27	36
Government	12	0	50	62
Total	473	8	989	1,470

Often an employment multiplier is calculated to illustrate the total employment impact of a facility or organization. The multiplier is derived by dividing the organization's total employment impact on the region by the number of workers it employs. The multiplier for NCMC's ongoing operations in the four-county region is 1.4. In other words, every ten employees at the college support another four jobs in the region in 2015. More importantly, the employment multiplier generated by the college's full impact, which includes employment created by its students' expenditures and the direct and indirect impact of the training services provided by CCE, climbs to 4.2. In other words, because of the college's ongoing operations, training programs for the region's businesses, and the expenditures of its students, every college employee supports an additional 3.2 jobs in the region.

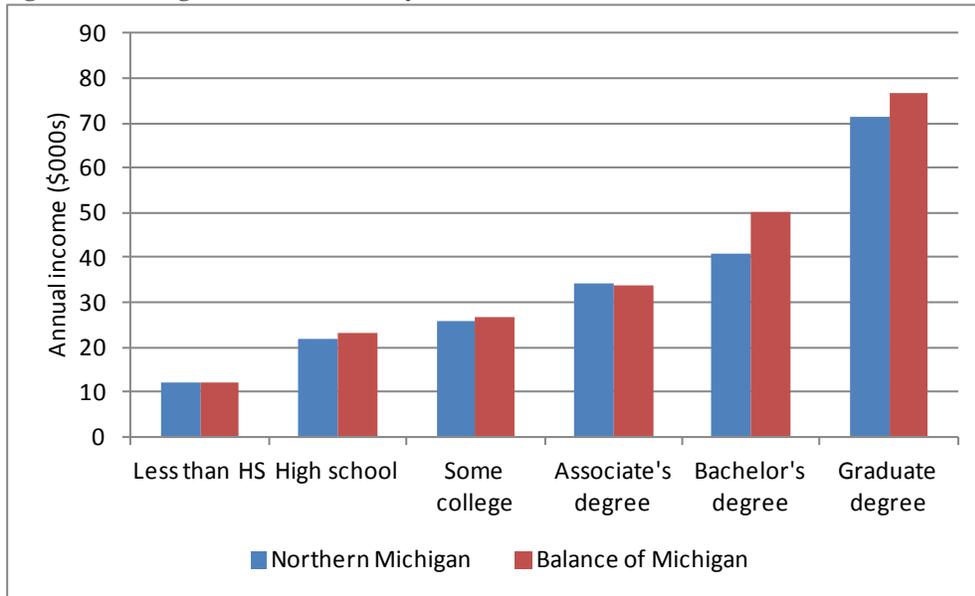
Impact on Potential Graduate Earnings

If young adults decide not to further their academic careers because of the absence of North Central Michigan College, it would significantly lower their lifetime earning potential. In the following figures, we show the 2013 average annual earnings and unemployment rates for working-age adults living in Alcona, Alpena, Antrim, Charlevoix, Cheboygan, Crawford, Emmet, Kalkaska, Missaukee, Montmorency, Oscoda, Otsego, Presque Isle, and Wexford counties.⁵ As can be seen in Figure 1, the average annual income of individuals with an associate's degree is 30 percent higher than that of persons who hold only a high school diploma. Moreover, as seen in Figure 2, associate-degree holders also experience lower unemployment rates than persons with only a high school diploma.

⁵ The geographic limitation of the IPUMS database, which provides a five percent sample of individual records from the 2013 U.S. American Community Survey, requires this large geographic area.

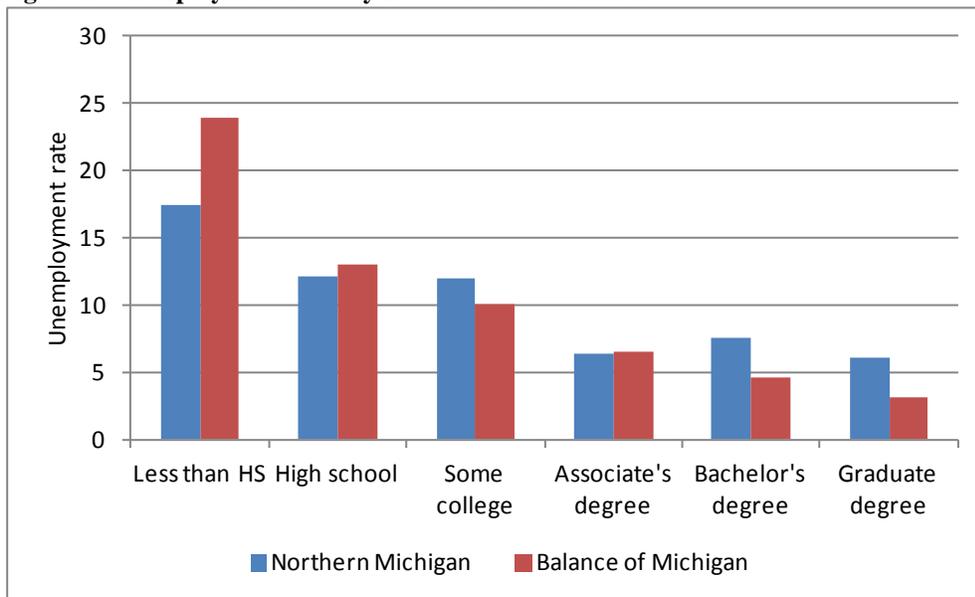
Over the course of their working careers, associate-degree holders in northern Michigan earn \$459,000 more than persons who only have a high school diploma. This calculation does not tell the full story; however, because it assumes that both the associate-degree holder and the high school graduate remain fully employed. As seen in Figure 2, associate-degree holders also experience lower unemployment rates than persons with only a high school diploma. Therefore, the likely returns of obtaining an associate degree are higher than \$459,000 during the person's lifetime.

Figure 1 Average Annual Income by Educational Attainment



SOURCE: Ruggles et al., IPUMS USA, 2013.

Figure 2 Unemployment Rate by Educational Attainment



SOURCE: Ruggles et al., IPUMS USA, 2013.

It should be noted that the above data do not specifically reflect the value of an NCMC associate's degree but rather an associate's degree from any institution of those employed in the Northern Michigan region.

Estimated Return on Investment of Attending NCMC

It is difficult to estimate the average return on investment (ROI) of a student attending North Central Michigan College for several reasons. First, some do not complete a certificate or degree program and yet receive economic benefits from attending classes which upgrade their skills. Second, NCMC offers a wide selection of unique programs that charge differential tuition rates based on higher program costs. Therefore, there is increasing variability in the cost of attendance depending on the program pursued. Third, students may take longer than two years to complete, and may not be successful in finding a career that uses their education to its utmost. Fourth, the opportunity cost of attending college—the loss of income from not working full time—varies greatly between students and their economic conditions. Finally, in estimating a lifetime flow of earnings generated by attending college, a proper discount rate must be used. There is much debate on this topic: too low of a discount rate will overvalue long-term returns, while the opposite is true if the discount rate is set too high.

As shown in Table 6, we provide three separate estimates for the return on investment for students completing their associate degrees at NCMC. These three scenarios are as follows:

- Scenario 1: A student completes an associate's degree from NCMC in two years, without receiving any financial support.
- Scenario 2: A student completes an associate's degree from NCMC in two years and receives financial support (Federal Pell Grant).

In both of the scenarios above, the student would forego the opportunity to earn \$9,600 per year for the 30 weeks that he/she is attending class for each of the two years. This is based on the student working full-time for \$8.00 per hour for 30 weeks each year.

- Scenario 3: A student goes to NCMC on a part-time basis, taking 11 credit hours each semester and completes an associate's degree in three years. During these three years he/she is also working part time, 20 hours per week, earning \$4,800 per year.

We estimate that the student paying full tuition (scenario 1) would see a \$6.87 return for every dollar spent attending college (2013 dollars); including foregoing earned income during the two years. As shown in the table, the earning difference between an associate's degree and a high school diploma expands with age as workers gain additional experience and additional training on the job. For the student receiving the average federal assistance package (Pell Grants—scenario 2) who completes in two years, the return is \$10.70 per every dollar invested. Finally, for the student who works and attends NCMC on a part-time basis, completing in three years (scenario 3), the return on his/her investment is \$8.50. Under scenarios 1 and 2, the average associate-degree holder earns an estimated \$459,000 more during their working career than a high school graduate.⁶ In the third scenario it is slightly lower. To estimate the current value of this difference in earning streams between an associate-degree holder and a high school graduate, a three percent discount rate was used to adjust for time preferences; current earnings are valued more than future earnings even when accounting for inflation.

⁶ It again should be noted that this assumes that both the associate-degree holder and the high school graduate remain employed during their working career. As shown in Figure 2, associate-degree holders face lower unemployment rates than high school graduates.

It is clear that the student’s ROI for attending college will vary greatly depending on the courses taken, parental support, and career success. Nevertheless, even under the conservative conditions stated above, attending NCMC is a smart move.

Table 6 Annual Return on Investment for Attending and Completing an Associate Degree at North Central Michigan College

Scenario	Total costs* (2013 dollars)	Total amount of federal assistance	Forgone earnings due to attending NCMC	Annual earning difference between associate's degree and high school diploma (2013 dollars)				Net present value	Return on investment
				20 to 34	35 to 44	45 to 54	55 to 64		
Full-time student completing in two years without financial support	\$9,166	\$0	\$9,600	\$6,237	\$9,605	\$13,970	\$12,987	\$194,965	\$6.87
Full-time student completing in two years with federal Pell Grant assistance	\$9,166	\$8,200	\$9,600	\$6,237	\$9,605	\$13,970	\$12,987	\$215,751	\$10.70
Part-time student completing in three years working part time	\$9,166	\$0	\$14,400	\$6,237	\$9,605	\$13,970	\$12,987	\$200,228	\$8.50

*In-district tuition, books, fees, and supplies - but does not include room and board

Estimated Cost Savings of Attending NCMC for the First Two Years of a Bachelor’s Degree

NCMC offers an extremely affordable avenue to earn a four-year bachelor degree at any of the state’s four-year colleges or universities. As shown in Table 7, in-district students can save nearly \$43,000 when obtaining a degree from the University of Michigan by attending NCMC and living at home during the first two years of the four-year degree. Substantial cost savings are available for students, living at home, who decide to attend Michigan State University, Central Michigan University, or Northern Michigan University, as well. For students choosing to live on their own while attending NCMC, the cost savings are still large and also shown in Table 7.

Table 7 Estimated Cost Savings of Attending North Central Michigan College for the First Two Years and Completing Bachelor Program at Four-Year College or University

2015–2016 School Year	
<u>Student living at home while attending NCMC</u>	
University of Michigan	\$42,931
Michigan State University	\$39,418
Central Michigan University	\$30,178
Northern Michigan University	\$29,765
<u>Student living on their own while attending NCMC</u>	
University of Michigan	\$29,251
Michigan State University	\$25,738
Central Michigan University	\$16,498
Northern Michigan University	\$16,085

Note: Assuming a 4.0 percent increase in tuition and room and board.

Source: IPEDS.

Summary

This analysis quantifies the significant economic impact of North Central Michigan College in its four-county service region. NCMC contributed \$253.6 million in total sales, \$66.1 million in personal income and \$120.2 million in total Gross Regional Product.

The college and its training activity generated 1,470 jobs in the four-county district. Every NCMC job supports 3.2 additional jobs in the four-county region. Clearly, NCMC is a net positive investment for the community. Local businesses are more competitive because NCMC contributes to a trained workforce.

At the student level, attaining an associate's degree yields a return of \$6.87 to \$10.70 for every \$1.00 of tuition and historically offers lower levels of unemployment. Finally, for students seeking a four-year degree at one of the state's universities or four-year colleges, NCMC offers an affordable pathway by allowing them to complete the first two years locally and at a much lower cost.

Appendix

Description of the REMI Model

The W.E. Upjohn Institute maintains an economic computer model specifically designed to estimate the economic impact of changes in the greater Petoskey region: Charlevoix, Cheboygan, Emmet and Otsego Counties. The model was constructed by Regional Economic Models Incorporated (REMI) and contains three separate components that together capture the resulting total impact to the local economy due to a change in employment. These components are:

- An input-output model that estimates the impact of changes in inter-industry purchases on the local economy. This component of the model captures the impact of an increase in orders to local suppliers of goods and services, as well as the impact of households increasing their purchases of consumer goods and services.
- A relative wage component that estimates the impact of the expected changes in the area's cost structure due to changes in economic activity. For instance, when a major employer moves into the area, it can cause wages to increase across almost all industries due to the increased demand for workers and other local resources. This boost in wages, while generating additional consumption expenditures, increases the cost of doing business in the area, making the area slightly less attractive to other industries. On the other hand, an increase in the number of skilled workers enhances the area's productivity, and thereby lowers the cost per unit of production, making the region more competitive.
- A forecasting and demographic component that forecasts the resulting changes in future employment and population levels due to a change in economic activity. The model generates an annual forecast which averages seasonal jobs by their duration. For example, four summer jobs that have durations of three months each are modeled as only one year-round job in REMI.

The model is particularly suited to measure the economic impact of higher-education institutions because:

- It contains a highly detailed breakdown of expenditures made by higher-education institutions. Other models use a more general breakdown that includes expenditures made by all education institutions including K-12 public and private schools.
- It allows for estimating the unique consumption expenditures made by students and the college's faculty and staff.
- Finally, it includes a residential component that allows for the modeling of the impact of students, faculty, and staff staying in the county and working outside the county. Other models mistakenly assume that once an employer has left the county, all of the workers would leave as well.

Finally, the model has been rigorously reviewed in numerous academic journals.