



Emsi Economic Impact Study: Outline of Methodology

Economic Impact Analysis

Economic impact analysis assesses the impact of a given economic event – in this case, the presence of the institution— on the economy of a specified region. Economic impact analyses use different types of impacts to measure results. The one employed in the Emsi study is the “income” impact, which assesses the change in earnings and business profits in the region. This is also known as “value added,” because these are earnings and profits that wouldn’t occur otherwise.

Emsi uses its Social Accounting Matrix (SAM) input-output model to break out impact measures into different components. The initial effect is the exogenous (external) shock to the economy caused by the initial spending of money, whether to pay for salaries and wages or purchase goods or services. This initial round of spending creates more spending across all industries in the economy, resulting in what is commonly known as the multiplier effect. Results for each impact measure shown in the Fact Sheet equal the sum of all initial and multiplier effects.

Spending impacts (operations and students)

- 1) **CLASSIFY SPENDING:** For operations impacts, the initial income effect comprises the payroll of employees. For students and visitors, there is no initial income effect, only an initial sales effect.
- 2) **DISTRIBUTE SPENDING ACROSS INDUSTRIES:** Payroll –To calculate the impact of multiplier effects, the payroll of employees living in the institution’s primary service region is distributed across the detailed industries in the SAM model using average household spending patterns. Non-Pay Spending – Other (i.e., non-pay) institutional spending is also distributed across the detailed industries in the SAM model in order to capture multiplier effects. For operations, other spending is distributed across industries using average college spending patterns.
- 3) **NET OUT WHAT’S NON-APPLICABLE:** For student spending impacts, only the expenditures of out-of-region students are considered. Spending is distributed to the various industries using average student and visitor spending patterns.
- 4) **DETERMINE IN-REGION SPENDING:** Once payroll and other spending are distributed across the detailed industries in the Social Accounting Matrix (SAM) model, regional purchasing coefficients—records of purchases between industries within the region—are used to estimate the amount of spending that occurs in the region. This automatically removes from the analysis any dollars spent outside region. In-region spending by industry is run through the SAM model’s multiplier matrix to estimate inter-industry multiplier impacts.
- 5) **APPLY “ALTERNATE USE OF FUNDS” COUNTERFACTUAL:** The calculation of operations impacts additionally considers a counterfactual scenario where all money from local sources is returned to the original consumers and spent instead on households, rather than being spent by the institution. This represents the opportunity cost of money received by the institution from local sources, and is subtracted from the gross spending impact.
- 6) **SUM MULTIPLIERS AND INITIAL FOR TOTAL IMPACT:** All multiplier effects calculated by the SAM model are reported in either income or jobs. Multiplier effects together with the initial effect comprise the total added income created in the economy.

Alumni impacts

- 1) OBTAIN HEADCOUNT: Determine how many alumni were served by the college. These data are provided by the college.
- 2) NET OUT NON-ACTIVE ALUMNI: Subtract alumni who are not still actively employed in the region—that is, those who have died, retired, are unemployed, or have migrated out of the region. These data come from the CDC, BLS, and the Census Bureau.
- 3) DETERMINE ALUMNI'S CREDIT ACHIEVEMENTS. Divide this year's total credits attained by this year's students. Now we know the average credit load per student this year, and we apply this average credit attainment to the alumni as well.
- 4) APPLY THE COUNTERFACTUAL "ALTERNATIVE EDUCATION" VARIABLE: Even if the college didn't exist, a portion of the students would still get a similar education through other means. Therefore, this portion of the impact is subtracted.
- 5) DETERMINE THE VALUE PER CREDIT:
 - By means of public data sources, determine regional earnings by education level, including the earnings increases associated with different levels of credit attainment between award levels (the rungs on the educational ladder).
 - College data provides the entry level of education (i.e., the starting point) of this year's students. The total earnings change - attributable to the education that the institution imparts - for each student category (starting point category) is calculated by adding the earnings change associated with the average credit load of the students (credits achieved beyond their starting point) and subtracting previous levels of attainment. This yields the marginal gain in wages due to the students' education.
 - Next, this earnings change is divided by the number of credits attained in the analysis year. This provides an average value per credit at each educational category.
 - Lastly multiply the number of total credits at each category / education level by their associated value per credit. Sum total earnings change of all categories. The total earnings change of all categories divided by total credit attainment results in the student body wide value per credit.
- 6) MULTIPLY VALUE PER CREDIT TIMES ALUMNI'S ACTIVE CREDITS
 - Multiply the value per credit by the number of credits still active in the region (Step 3). This gives us the total added income received in the region by all active alumni during the analysis year.
 - Apply the "substitution" counterfactual: If the college didn't exist, a portion of this income would have been added to the region anyway as employers would meet their workforce needs by importing labor. Therefore, this portion of income is subtracted.
- 7) USE THE ADDED INCOME TO QUANTIFY THE STUDENT CONTRIBUTION to their businesses (the non-labor income)
 - Determine the occupations the students are currently employed, by using the BLS "CIP to SOC" crosswalk, and the industries which employ these occupations, using Social Accounting Matrix (SAM).
 - Then apply industry-specific "jobs to sales" ratios to see the extra value that the employed students added to their businesses.
- 8) RUN MULTIPLIER EFFECTS AND SUM TOGETHER FOR TOTAL ALUMNI IMPACT
 - Run the income and non-labor income through the SAM to derive the multipliers.
 - These are the "ripple effects" when the students with extra income spend their money in the region and when extra productive businesses buy more from their supply chains.
 - Sum up the initial values with these multipliers, and the result is the total alumni impact for 2013-14.

Investment Analysis

Investment analysis is a standard method for determining whether or not an existing or proposed investment is economically viable. This methodology is appropriate in situations where a stakeholder puts up a certain amount of money with the expectation of receiving benefits in return, where the benefits to the stakeholder are distributed over time, and where a discount rate must be applied in order to account for the time value of money. After all, \$1 today is worth more than \$1 tomorrow.

The measures most commonly used in investment analysis are the net present value, the benefit-cost ratio, and the internal rate of return. The net present value indicates the magnitude of a given investment and is equal to the present value of the benefits less the present value of the costs. The benefit-cost ratio is used to indicate the amount of benefits received by the stakeholder for every dollar spent and is calculated simply by dividing the present value of the benefits by the present value of the costs. The rate of return measures the yield of the investment. The rate of return must be greater than the minimum acceptable rate of return (assumed in this study to be the discount rate) in order to be considered a worthwhile investment.

Student perspective

- The investment analysis from the student perspective compares benefits and costs that accrue to the institution's 2013-14 student population.
- Benefits include the incremental increase in lifetime earnings enjoyed by the 2013-14 student population as a result of the skills they attained during the analysis year. Earnings are projected out over the working life of the student population and are discounted back to the present using a discount rate of 4.5%. The projected benefits stream factors in death, unemployment, and retirement rates in order to determine how many students leave the workforce over time.
- Student costs include the direct outlays incurred by students – including tuition, fees, books, and supplies – and the opportunity cost of the time spent on education rather than working.

Social perspective

- The social perspective compares the benefits and costs that accrue to society as a whole in the state.
- Benefits include the added income created in the state as a result of the institution's spending impacts during the single analysis year, the higher lifetime earnings that accrue to the 2013-14 student population, the increased profits that accrue to businesses that employ the institution's 2013-14 students, and the social savings that occur across the state from the reduced demand for health, unemployment, and law enforcement services (both private and public).
- With the exception of the institution's spending impacts (these only occur during the single analysis year), benefits are projected out to the future and discounted back to the present using a discount rate of 1.1%. The discount rate from the social perspective is defined by the Office of Management and Budget and is the same one used by the federal government to assess the feasibility of government programs.
- Costs to society include all institutional expenses (less tuition) and all student costs (including tuition and opportunity costs).

Taxpayer perspective

- The taxpayer perspective compares the benefits and costs that accrue to state and local taxpayers in the state.
- Benefits comprise the added tax revenue and avoided costs to state and local government in the state. They are calculated by applying average state and local tax rates to the same benefits stream used in determining the investment analysis results from the social perspective.
- Costs include all state and local government support received by the institution. If the institution received no state and local government support during the analysis year, standard investment measures such as the net present value, benefit-cost ratio, and rate of return are not reported in the Fact Sheet.