Economic impact study methodology

Economic Impact Analysis

When exploring the economic impact of the institution, we consider the following hypothetical question:

How would the region's economic activity change if the institution and all its alumni did not exist in the fiscal year?

The analysis breaks out the impact measures into different components and focuses on assessing the change in income in a given region, similar to the commonly used Gross Domestic Product (GDP), except at the regional level. Another way to state the impact is in terms of sales, which is the change in business sales revenue in the economy as a result of increased economic activity. Bear in mind, however, that unlike income, sales includes intermediary transactions and does not account for money that leaks out of the region. Finally, a frequently used measure is the jobs impact, a measure of the number of full- and part-time jobs that would be required to support the change in income. To calculate the jobs impact, we consider how much each industry is being impacted in terms of added income, whether it's through the institution's expenditures or student spending, and divide that by the regional average wage in each industry. Finally, we sum these jobs by industry to arrive at the total number of jobs supported.

Whichever measure is used, each measure is broken out into different effects. First, the initial effect, or initial spending of money, occurs when salaries, wages, and benefits are paid or goods and services are purchased. Then, the initial spending of money creates more spending in the economy, commonly known as a multiplier or ripple effect. For example, such spending includes an employee using wages to purchase groceries and then the grocery store's purchases from their supplier and so on. All the additional income created in the economy as a result of the institution and its students spending money in the region is accounted for in the multiplier effect.

Of course, the types of goods and services purchased by the institution are very different from those purchased by a student or resident in the region. Lightcast's model relies on a matrix representation of industry-to-industry purchasing patterns and is referred to as a multi-regional social accounting matrix (MR-SAM). The purchasing patterns used in the model are derived from the U.S. Department of Commerce Bureau of Economic Analysis (BEA) Make and Use Tables, called MUTs, which are the basis for any such model in the U.S. However, the BEA MUTs, because of data suppression, do not provide us with spending patterns for all U.S. industries. Furthermore, the BEA MUTs are more accurate at capturing spending patterns at a state level rather than a county level. As a result, Lightcast uses additional data sources, from federal institutions as the Bureau of Labor Statistics and Census Bureau, as well as proprietary algorithms to fill in any gaps in the MUTs.

Finally, we aim to be conservative in our methodologies. The impacts presented in analysis are reported as net impacts. The gross impacts represent an upper-bound estimate of all economic activity stemming from the institution. We adjust this downward by considering several counteractions that result in the net impact being a truer and more accurate impact. For example, for the operations impact, we estimate the counterfactual by simulating a scenario where in-region monies spent on the institution are instead spent by local taxpayers and in-region students, thus creating an impact regardless of the institution's presence in the region. In addition, we do not consider the entire year's student population in the student spending impact; we only consider those who would not have been in the regional economy if not for the institution's presence. And finally, for the alumni impact, we apply two counterfactual scenarios. First, we assume a portion of the institution's alumni would have received a comparable education elsewhere, whether its inside or outside of the region, and returned to the region to work in the regional workforce. Second, we account for a labor import effect. If the institution did not exist and there were fewer skilled workers in the region, businesses would satisfy some of their need for skilled labor by recruiting from outside the region.

The following sections describe the methodologies used to calculate the value of the operations and student spending impacts and the alumni impact in the economic impact analysis.

Operations, construction, and student spending impacts

Classify spending: For the operations impact, the initial income effect comprises the payroll of employees. For construction and students, there is no initial income effect, only an initial sales effect.

Distribute spending across industries: Payroll —To calculate the impact of the multiplier effects, the payroll of employees living in the institution's service region is distributed across the detailed industries in the MR-SAM model using average household spending patterns. Non-Pay Spending — Other, that is non-pay, institutional spending is also distributed across the detailed industries in the MR-SAM model, in order to capture the multiplier effects. For operations spending, other spending is distributed across industries using average college spending patterns.

Net out what's non-applicable: For the student spending impacts, only the expenditures of out-of-region and retained students are considered. Spending is distributed to the various industries using average student spending patterns.

Determine in-region spending: Once payroll and other spending are distributed across the detailed industries in the MR-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 MR-SAM model's multiplier matrix to estimate inter-industry multiplier impacts.

Apply "alternate use of funds" counterfactual: The calculation of operations impacts additionally considers 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.

Sum multipliers and initial for total impact: All multiplier effects calculated by the MR-SAM model are reported in either added income or jobs supported. Multiplier effects together with the initial effect comprise the total added income created in the economy.

Alumni impact

Obtain headcount: Determine how many alumni were served by the college. These data are provided by the college.

Net out non-active alumni: Subtract alumni who are not 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 Center for Disease Control, the Bureau of Labor Statistics, and the Internal Revenue Service.

Determine alumni credit achievements: Divide the year's total credits attained by the year's students. Now we know the average credit load per student for the fiscal year, and we apply this average credit attainment to the alumni as well.

Apply the counterfactual alternative education variable: Even if the institution did not exist, a portion of the students would still get a similar education through other means. Therefore, this portion of the impact is subtracted from the gross impact.

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).

Institutional data provide the entry level of education (i.e., the starting point) of the fiscal 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 fiscal 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's value per credit.

Multiply value per credit by active alumni 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 institution did not 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 from the gross value.

Use the added income to quantify the student contribution to their businesses (the non-labor income):

Determine the students' current occupations by using a program to occupation mapping and then tie the occupations to regional industry data. The mapping is based upon the one developed by the Bureau of Labor Statistics, and the MR-SAM is used to determine which industries employ the specific occupations.

Apply industry-specific jobs-to-sales ratios to see the extra value that the employed students added to their businesses.

Run multiplier effects and sum together for total alumni impact:

Run the income and non-labor income through the MR-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 the fiscal year.

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 students' perspective compares the benefits and costs that accrue to the institution's fiscal year's student population.

Benefits include the incremental increase in lifetime earnings enjoyed by the fiscal year's student population as a result of the skills they attained during the year. Earnings are projected out over the working life of the student population and are discounted back to the present. The discount rate is derived from the baseline forecast of the 10-year Treasury rate published by the Congressional Budget Office. 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 in the state.

Benefits include the added income created in the state as a result of the institution's spending impacts during the fiscal year, the higher lifetime earnings that accrue to the fiscal year's student population, the increased profits that accrue to businesses that employ the institution's fiscal year's 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 year), benefits are projected out to the future and discounted back to the present. 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).