Methodology – Economic Contribution of Maine's Private Colleges

Economic Model

The economic contribution of Maine's private colleges was estimated using the Regional Input-output Modeling System (RIMS II) that was developed by the US. Bureau of Economic Analysis (BEA). The RIMS II model is a widely used model for quantifying the regional economic effects of economic activities related to spending, employment, and earnings. The model uses input-output tables that quantify how revenues and expenditures in one industry relate to other industries and the economy as a whole. It provides multipliers for 406 detailed industries and 62 aggregate industries, defined by the North American Industry Classification System (NAICS), that estimate the total change in economic activity across all industries in the region resulting from the economic activity from one industry or project.

For this analysis, we followed the RIMS II approach to Contribution Studies as described in the RIM II Users Guide. For an economic contribution study of Maine's private colleges, the RIMS II model requires two types of data: the initial levels of economic activity that are associated with the private colleges, including their operational spending, capital expenditures, and student and visitor spending; and the regional multipliers that reflect the inter-industry relationships and household spending patterns within the local economy. The initial levels of economic activity related to the colleges are derived from data provided by the Maine Independent Colleges Association (MICA) and adjusted by Stepwise to align with the RIMS II methodology. Separate multipliers were purchased from RIMS II for each college's economic region (county) and for the state as a whole. Spending by the colleges was separated by the industry it occurred in and multiplied by the appropriate RIMS II multiplier for that region and industry.

The results of the RIMS II modeling characterize the economic contribution of Maine's private colleges through four indicators: output, earnings, employment, and value-add. Output is the value of goods and services produced in the region as a result of the colleges' activities. Earnings are the wages and salaries paid to workers in the region who are employed directly or indirectly by the colleges or by the industries that benefit from the colleges' activities. Employment is the number of full-time and part-time jobs created or supported by the colleges' activities in the region. Value-add is the additional value that is created at each stage of production in the economy; that is, the difference between the total output of an industry and the intermediate inputs used by that industry.

For instance, the RIMS II final demand multiplier for output for the private college industry in the Maine economy is 1.8. This means a dollar of output by the college supports roughly $1.80 of output throughout the Maine economy.

Note that for earnings and jobs, RIMS II also provides direct-effect multipliers. These direct-effect multipliers resulted in higher estimates of total economic activity and therefore were not used in order to be as conservative in our estimation of possible.

More information can be found here: https://www.bea.gov/resources/methodologies/RIMSII-user-guide.

Estimation Procedure

Detailed financial information for each college was collected to estimate the initial footprint of economic activity. With the exception of capital expenses, the information for each college was then applied to a unique RIMS II model of the college's regional economy. For example, the Androscoggin County RIMS II model was used for Bates College and the Hancock County RIMS II model was used for College of the Atlantic. For capital expenses, because the labor and materials are sourced statewide, the statewide multipliers were used instead of the regional models. The economic contribution for each college was calculated in four categories:

1. The operational contribution was estimated using a college's operating expenses, compensation, and employment which were then applied to the RIMS II industry for "Junior colleges, colleges, universities, and professional schools." Consistent with the requirements of the RIMS II model, the amount of operating expenses that went to employee retirement (which is not spent in the economy immediately) was excluded. Student employees were also excluded from the counts of employees.
2. Capital expenses were reported by each college separately for construction, equipment, software, and books and art. Only expenses paid to Maine-based companies were included. For non-construction categories, the portion of expenses that went to the production of the commodity that was not produced in Maine was also excluded. The exclusion amounts were estimated using data from the US Bureau of Economic Analysis Personal Consumption Expenditures and Private Equipment Bridge accounts (PEQ and PCE, 2022): 51% of expenditures on Software was excluded (PCE category of Computer Software and Accessories); 45% of expenditures on Books/Art was excluded (PCE category of Educational Books); and 55% of expenditures on equipment was excluded (PEQ category of Autos, which made up the bulk of equipment purchases). The reduced expenses were then applied to the appropriate statewide RIMS II multipliers: nonresidential construction for construction ; motor vehicle and parts dealers for equipment software publishers for software; book publishers for books and art. In consultation with RIMS II staff, the statewide multipliers were used because, unlike the other types of expenses, the materials and labor would likely come from around the state as opposed to locally.
3. The economic contribution from students was conservatively estimated in the following way: full-time students who were not on a room and meal plan were assumed to spend the equivalent of their college's room and meal costs in the local community. This spending was then applied to the RIMS II categories for Food and Beverage Stores (representing meals) and Real Estate (representing board). Then, for all full-time students, the amount that each college provides to students as budget for non-billable expenses was used to estimate additional spending in the community. The average non-billable spending for all MICA colleges for books and personal expenses was $2,300 and this amount was multiplied by the number of full-time students for each college. The RIMS II multipliers for household spending were then used, which represents general household income/spending and is among the most conservative multipliers.
4. The economic contributions from visitors were also conservatively estimated. Only parents and alumni were included in the economic analysis. Visitors for cultural, sporting, or other

events were not included. Most of the parent and alumni visitor estimates came directly from the MICA colleges. For two colleges who did not provide an estimate, the average per student estimates for parent visits (1.8) and alumni (0.4) for the other MICA colleges were used. Visitor spending was then estimated by using detailed spending information from the Maine Office of Tourism (MOT). An analysis of the MOT data estimated that overnight visitors spent $214/day among a multitude of categories. The estimated parent and alumni visits were multiplied by the spending per day and allocated across these categories. Transportation expenses were assumed to be mostly gasoline and reduced by 75% according to the Us Energy Information Agency's estimate of the percentage of gas costs attributed to the production of the commodity. Retail expenses were assumed to be clothing and reduced by 50% to exclude the production value of the commodity (per the BEA PEC). Each of these categories was then mapped to the appropriate RIMS II industry: Accommodations to Accommodations; Restaurants to Full Service Restaurants; Retail to General Merchandise Stores; Ground Transportation (including gas) to Transit and ground passenger transportation; Recreation and Arts to Museums, historical sites, zoos, and parks.

These four parts of a college's economic contribution were added together to derive the total economic contribution for each college. The total contribution economic of all MICA colleges is then simply the sum of each college's economic contribution.

5. Finally, the total earnings associated with each college were multiplied by the Maine Revenue Services tax incidence tables for income, sales, and property taxes to estimate the amount of taxes that all of this economic activity generated.