

University Contribution Studies Using Input-Output Analysis

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Abstract: Many universities report results based on input-output (I-O) analysis to promote the contribution that they make to a regional economy. How these results are obtained is not always clear. Nor are they always based on best practices. This paper presents best practices when using a regional I-O model to conduct a university contribution study. It also provides examples that suggest a transparent framework for presenting results.

Public universities have come under increasing pressure to promote their contributions to their respective regional economies. One of the most common ways to do so is through the use of a contribution study based on a regional input-output (I-O) model.

Even though regional I-O models have a long tradition of being used to estimate the economy-wide impacts of spending and investment projects, the results of university contribution studies are often difficult to assess because of a lack of transparency. Often little information is included in the report on how the results are generated and the types of economic activities measured.

In cases where sufficient information is provided, the university contribution estimates are often unreasonably high because the model was not properly used.² The most common misuses result in “double counting,” where the impacts of employee or student spending are counted more than once.

Regional I-O models are not well suited for measuring the contribution of some university-related activities, such as “downstream” activities related to research laboratories that locate in the area because of a university’s presence. Regional I-O models also cannot be used to measure the returns to society from the development of human capital.

The main purpose of this paper is to serve as a guide for best practices when using a regional I-O model to conduct a university contribution study. The examples provided in this paper are intended to suggest a transparent framework for generating and presenting results.

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² For a discussion of the pitfalls common to studies of the economic impact of colleges and universities, see Siegfried, Sanderson, and McHenry (2007).

How Regional I-O Models Work

The premise behind a regional I-O model is that an initial change in economic activity leads to additional changes in economic activity in other industries or sectors of an economy—for example, an increase in the provision of educational services leads to an increase in the production of electricity to power dormitories and classrooms. The increased production of power, in turn, leads to an increase in the production of coal and natural gas. Workers and business owners benefiting from these increases in economic activity will also spend more, which results in additional economic activity.

To account for the industry-to-industry and the industry-to-household relationships, most regional I-O models use information from the Bureau of Economic Analysis (BEA) national industry accounts.³ These accounts provide the “recipes” of goods and services used as inputs by industries to produce goods and services—for example, they show how much universities spend on electricity to provide educational services. These accounts also show how much households spend on goods and services.

Regional I-O models adjust these relationships using regional economic data to account for the fact that many goods and services purchased by local industries are “imported” from outside the region—for example, a local utility company may need to purchase coal from another region. These imports result in money “leaking” out of the local economy and no longer affecting the region.

The adjusted relationships are then used to calculate regional “multipliers,” which can be used to estimate the economy-wide effect that an initial change in economic activity has on a region. The economy-wide effect is usually measured in terms of gross output (sales), value added (gross domestic product), earnings, and jobs (full- and part-time).⁴

Most regional I-O models produce two types of multipliers. Type I multipliers account only for the “inter-industry” (direct and indirect) effect of an initial change in economic activity. Type II multipliers account for both the inter-industry and “household-spending” (induced) effects associated with an initial change in economic activity. Most university contribution studies are based on Type II multipliers, which are more difficult to use in a manner that avoids double-counting.

Even though regional I-O multipliers have traditionally been used to estimate the economic impact of an incremental change in economic activity, such as an increase in the provision of educational services, these multipliers have increasingly been used to estimate the contribution of an entire industry, such as the medical industry, or an institution, such as an academic university, to a regional economy.

³ BEA’s industry accounts cover the U.S. national economy. A few regional I-O models are based on survey data that is collected for an individual state to build a state-level I-O table.

⁴ For more information on how the model is created and its underlying assumptions, see Ambargis and Mead (2012).

Conducting a Contribution Study

To calculate a university's contribution to a regional economy, the scope of economic activity and the study region need to be chosen. Once these choices are made, the inputs needed by the model can be determined.

Scope of university activity

I-O models can be used to estimate the economic contribution of the following types of university-related activities:

- University operations
- Capital expenditures
- Student spending
- Visitor spending

Not all of these activities need to be included in a university contribution study, but if they are, their contributions need to be estimated separately because of the difference in inputs required by each activity.

In the context of regional I-O models, university operations include the provision of educational and student services. Student services, such as student health clinics and recreational facilities, and auxiliary operations, such as university-operated book stores, residence halls, and cafeterias, are also considered part of university operations. University operations do not include the operation of university hospitals that provide services to the general public. If the impact of a university hospital is to be included in a study, the results related to the hospital need to be calculated separately by using multipliers for the hospital industry.

Capital investment includes new construction and purchases of equipment and software. Because these expenses are not treated as part of operating expenses in an I-O model, their impact on the regional economy needs to be calculated separately.

Student spending includes purchases made by students who have temporarily moved into the region to attend the university. Their spending includes expenditures for off-campus housing, groceries at local stores, and entertainment at local venues. To avoid double counting, student spending should not include tuition and on-campus housing because this spending is included in university output.

Visitor spending includes purchases made by the regular stream of people who visit the region to see students or attend regularly held university events. At least for long-running, recurring events, this activity supports local business because visitors stay at local hotels and eat at local restaurants.

Study region

The study region consists of the geographic area for which the economic contribution of a local university is measured. Even though the choice of this region often receives little attention, this decision can greatly influence a study's results.

The choice of the study region depends on the purpose of the study and the questions being asked. The region should be large enough to capture the interdependencies among the local industries that support the university but small enough that the results are economically significant. For example, a small liberal arts college may support a large share of a small college town's economic activity but a negligible share of the state's economic activity.

If the effects of university employee spending are to be included in the study, the study region should encompass the area where the employees will spend most of their earnings. One of the biggest mistakes that can be made in studies that include the effects of employee spending is to use a study region that is much larger than the area where the employees are likely to spend their earnings. This practice can lead to overstated estimates of the university's contribution to the region.

Using a political jurisdiction as the study region often does not allow a regional I-O model to properly account for important interrelationships between economic activities—for example, using the county where a university is located as the study region will not capture the spending of the university employees who live outside the county.

Core-based statistical areas, such as the U.S. Office of Management and Budget's metropolitan statistical areas (MSAs), often serve as good choices for a study region because they consist of areas with close economic ties. Smaller regions, if they contain many of the industries that support the university, may also serve as a good choice for the study region.

User inputs

To conduct a university contribution study based on a regional I-O model, an analyst, at a minimum, needs to provide a measure of university output to calculate the contribution of the university's operation to the regional economy. If the study includes the impacts of other university-related spending, information about these other types of spending is also needed.

Regional I-O models assume that there is a common production pattern across all universities. If the spending pattern of the university under consideration differs substantially from the average spending pattern of universities in the national I-O accounts, then using the more involved bill-of-goods method may be more appropriate.⁵

The value of university output should exclude any university services that are purchased by businesses inside the region, regardless of whether a Type I or Type II university multiplier is used for the analysis. When using a Type II university multiplier, the value of university output should also exclude purchases of university services by households in the region. Not following these practices will result in double-counting and inflated results.

⁵ Since labor costs constitute such a large share of a university's expenses, it is important to see if the ratio of employee compensation to output for the university is similar to the analogous ratio in the national I-O accounts when considering the use of the bill-of-goods method. For a discussion of the application bill-of-goods method in university contribution studies, see Ambargis, McComb, and Robbins (2011).

University operations

To calculate the contribution of university operations to the region, a measure of university output is needed. This output can be measured in one of two ways: tuition receipts or university expenses. University expenses are the preferred measure because they more closely align with how university output is measured for a majority of universities in the national I-O accounts. Tuition receipts are more likely to understate the value of university output because state funding, private donations, or endowments may cover much of the university's operating expenses.

When using a regional I-O model, the expenses that are used to measure university output should cover not only the costs of providing educational services, but they should also cover the costs of providing student services. Student services include student health clinics and recreational facilities. They also include other auxiliary operations, such as university-operated book stores, residence halls, and cafeterias. Finally, the measure of university output should include expenses related to research and development expenses.⁶

The expenses used to measure university output should not only include the goods and services purchased by the university, but they should also include the compensation of employees. Scholarships, fellowships, and grants should be included only if they are linked to labor services provided by the recipients of these awards because they represent expenses used to measure university output.

University output should exclude the expenses associated with new construction and purchases of equipment and software that are used for more than a year. These are investment purchases, not the intermediate inputs used in regional I-O models to measure an industry's output. Expenses related to the operation of a university hospital that provides services to the general public should also be excluded because they are treated as part of the hospital industry's output in regional I-O models.

It is recommended that depreciation and interest payments are excluded from the measure of university output because of the special way these measures are calculated in the national I-O accounts. Excluding these two measures will result in more conservative contribution estimates.

The expenses included in output usually appear in the budget reports of universities but may differ across universities because of different reporting standards. An alternative and more consistent source for this information is the financial survey data prepared by universities and collected by the U.S. Department of Education to maintain its Integrated Postsecondary Education Data System (IPEDS).

If a Type II university multiplier is used in the analysis, the value of the university output needs to be adjusted to exclude university output that is purchased by households in the region because the impact of their purchases is captured in the Type II multiplier. This adjustment can be made by prorating the measure of university output by the percentage of students that come from outside the region.

⁶ BEA plans to treat R&D expenses as investment with the release of its 2007 benchmark I-O accounts in late 2013. For regional I-O models that will be based on the 2007 I-O accounts, research and development expenses will need to be excluded from output and treated as a capital investment.

Method. The contribution of the university’s operation to the region can be calculated in four steps:

1. Calculate university output.
2. If using Type II multipliers, prorate university output by the share of non-local students.
3. Separately multiply this measure by the Type I and Type II multipliers for universities.
4. Subtract the result calculated with the Type I multiplier from the result calculated with the Type II multiplier to separately identify the household-spending effect.

Example. Consider a university that is interested in estimating the contribution its operations make to the local economy. The contribution will be measured in terms of gross output, value added (GDP), earnings, and employment (full- and part-time jobs). Only 20 percent of the students are from the region.

Table 1 shows the university expenses that are used to calculate university output. University output based on this information is \$750 million. Because Type II multipliers are used in the analysis, this value needs to be multiplied by 0.80 to account only for the students from outside the region. The resulting value is \$600 million, which is used with the multipliers for universities.

Table 1
Operating Expenses
[Millions of dollars]

	Total	Salaries & wages	Employee fringe benefits	Operation and maintenance of plant	All other
Instruction	380	246	96	8	30
Research	122	55	22	3	42
Public service	30	15	5	1	9
Academic support	43	24	8	1	10
Student services	24	13	4	1	6
Institutional support	59	28	13	1	17
Scholarships and fellowships expenses	27	—	—	—	—
Auxiliary enterprises	65	29	7	2	27
Total	750	410	155	17	141

1. Total excludes depreciation and interest.

Source: Integrated Postsecondary Education Data System (IPEDS) Finance Survey.

Table 2 shows university multipliers for the study region. The Type II multipliers are larger than the Type I multipliers. Not only do the Type II multipliers account for inter-industry effects, but they also account for household-spending effects.

Table 2
University Multipliers for Study Region

	Output	Value added	Earnings	Employment (jobs/ \$1 million)
Type I	1.4463	0.8368	0.5716	15.6997
Type II	2.1618	1.2769	0.7805	21.5568

Table 3 shows the results of multiplying each of the multipliers by the adjusted value of university output (\$600 million). The last row is equal to the difference in the results between the Type I and Type II multipliers for each measure of economic activity and shows the household-spending (induced) effects of all employees affected by the general operation of university in the region.

Table 3
Multiplied Effect of University Operations

[Millions of dollars]

	Output	Value added	Earnings	Employment (jobs)
Type I	868	502	343	9,420
Type II	1,297	766	468	12,934
Induced	429	264	125	3,514

Note: The adjusted value of university output (\$600 million) is applied to both types of multipliers to calculate the induced impact.

The results from these calculations show that the inter-industry effects on output (\$868 million) are greater than the household spending effects (\$429 million). The sum of these effects equals \$1,297 million, which includes the initial \$600 million of university output.

Capital investment

The impact of the university's spending on new construction, equipment, and software needs to be estimated separately from the contribution of university operations. Because construction projects are good candidates for the use of more advanced techniques, this section will focus on estimating the impacts related to purchases of equipment and software.⁷

Calculating the impacts related to purchases of equipment and software from a local wholesaler or retailer should account for the way that these purchases are measured in an I-O model. In an I-O model, the output of the retail and wholesale trade industries is measured by the wholesale and retail markup (margin). Since only the local impact is relevant to the analysis, this accounting practice allows these for

⁷ For more information on how to estimate the impact of construction projects, see the section entitled "Construction" in Ambargis and Mead (2013).

a separate account for the output of producers, wholesalers, and retailers, who are often located in different regions.

Method. The impact of an equipment or software purchase can be calculated in five steps:

1. Determine how much the university spends on equipment and software. This cost should include any sales and excise taxes.
2. Calculate the margins and producer value (purchase price less margins) for the purchase.
3. Multiply the wholesale or retail margin by the retail or wholesale multiplier.
4. If the producer is located in the region, multiply the producer value by the multiplier for the industry producing the equipment or software.
5. Sum the results from steps 3 and 4.

Example. Consider the case where the university purchases \$13.6 million in computer equipment. This equipment is manufactured outside the region but purchased from a local wholesaler. The university would like to calculate the total impact on output related to the purchase.

Because a wholesaler is the only local business involved in the supply of the computer equipment to the university, only a local wholesale margin needs to be calculated. Table 4 shows the wholesale margin and purchaser value for computer equipment purchases at the national level. The wholesale share at the national level is calculated by dividing the national wholesale margin by the national purchaser value.

Table 4

U.S. Wholesale Trade Margin

	Wholesale margin (millions of dollars)	Purchaser value (millions of dollars)	Wholesale share
Computer equipment	11,773	68,223	.17

Source: Commodity Composition of Private Fixed Investment in Equipment and Software (PES), Bureau of Economic Analysis.

Table 5 shows an estimate of the local wholesale margin that is derived by multiplying the purchase price of the computer equipment times the national wholesale share calculated in table 4.

Table 5

Local Wholesale Trade Margin

	Local purchase (millions of dollars)	U.S. wholesale share	Local wholesale margin (millions of dollars)
Computer equipment	13.6	.17	2.3

Table 6 shows how the total change in output is calculated based on the change in local output that is calculated in the previous table. This calculation is made by multiplying the change in output for the wholesale trade industry by the local multiplier for the wholesale industry.

Table 6
Output Impact for Computer Equipment
 [Millions of dollars]

	Local wholesale margin	Output multiplier	Output impact
Wholesale trade	2.3	1.9184	4.4

The impact on output is smaller than might initially be expected because the calculation appropriately recognizes that the computer equipment was not produced in the region.

Student Spending

Two methods are commonly used to calculate the economic impacts of student spending on the region. The first method multiplies total student spending by a household spending multiplier. The second method multiplies student spending on each type of good or service by the related industry multiplier. The second method is preferred because it more accurately accounts for the spending patterns of students.

Tuition and student spending at establishments owned or operated by the university, such as bookstores or dining halls, should be excluded because this spending has already been accounted for in the contribution calculated for university operations. When using Type II multipliers, the spending of students who work in the area should be excluded to avoid double counting, since their spending on tuition is accounted for in the induced impact.

Method. The impact of student spending can be calculated in five steps:

1. Collect detailed information on the spending of students who have temporarily moved to the area to attend the university.
2. For each service, multiply how much they paid for the service by the industry's multiplier.
3. For each good, calculate the margins and producer value.
4. For each local industry involved in the supply of each good, multiply the margin or producer value by the industry's multiplier.
5. Sum the results from steps 2 and 4.

Example. Consider the case where the university has collected survey information on student spending. The university would like to calculate the impact that student spending has on output in the region.

Table 7 shows the spending of residence hall and off-campus students who do not work in the region. This spending of students who work in the region is excluded to avoid double counting.

Table 7
Student Spending
[Thousands of dollars]

	Local spending
Books and supplies	1,495
Restaurants	1,620
Entertainment	1,100
Miscellaneous	170
Housing	1,915
Groceries	480
Total	6,780

The housing estimate excludes spending on on-campus housing. The restaurant estimate excludes spending on meal plans. Spending on both of these services is already accounted for in the impact of university operations.

For this example, it is assumed that retailers are the only local businesses involved in the supply of books, supplies, and groceries to students, so only retail margins need to be calculated. Table 8 shows the retail margins and purchaser values for books and supplies and for groceries. The retail shares at the national level are calculated by dividing the national retail margins by the national purchaser values.

Table 8
U.S. Retail Trade Margin

	Retail margin (millions of dollars)	Purchaser value (millions of dollars)	Retail share
Books and supplies	8,403	13,187	.27
Groceries	155,819	571,999	.27

Source: Commodity Composition of Personal Consumption Expenditures (PCE), Bureau of Economic Analysis.

Table 9 shows estimates of the local retail margin that are derived by multiplying the purchase price of each type of good times the national retail shares calculated in table 8.

Table 9
Local Retail Trade Margin

	Local retail purchase (thousands of dollars)	U.S. retail share	Local retail margin (thousands of dollars)
Books and supplies	1,495	.27	408
Groceries	480	.27	131
Total	1,975	—	539

The results indicate that the retail shares are identical, but the local retail margin on books and supplies is much larger because students spend more on these items. Because there is a single multiplier for the retail trade industry, the retail trade margins for each of the two separate categories of goods can be summed and the result can be used directly with the retail trade multiplier.

Table 10 shows how the total impact of student spending is calculated. The local purchases in the second column are multiplied by the corresponding multiplier in the third column to generate the output impact in the final column. In the case of retail trade, the local retail trade margin (\$539 thousand) is multiplied times the retail trade multiplier. The total impact of student spending represents the sum of the output impacts across all industry.

Table 10
Multiplied Effect of Student Spending
[Thousands of dollars]

	Local purchase	Output multiplier	Output impact
Restaurants	1,620	2.0157	3,265
Entertainment	1,100	2.0292	2,232
Miscellaneous	170	2.0966	356
Housing	1,915	1.5192	2,909
Retail trade	539	1.9421	1,047
Total	5,344	—	9,809

The largest economic impact on the region results from student spending at restaurants. Even though student spending on books and supplies and on groceries is larger than spending at restaurants, the impact on the region resulting from spending on books and supplies and groceries is smaller because the purchased goods were not produced in the region.

Visitor Spending

The impact of visitor spending on a region is calculated in much the same way as the impact of student spending, but an additional consideration needs to be taken into account.

Regional I-O models are not well suited to calculate the impacts associated with non-recurring short-term events, such as one-time sporting events. These models are based on the assumption that any changes in spending are persistent or permanent enough to work their way entirely through the economy.

In the case of visitor spending, the important question to ask is whether it is likely that additional businesses or jobs exist in the local economy solely because of the need to accommodate visitors to the university on a regular basis. For universities that are major tourist attractions, the answer may be yes. However, in the case of many other universities, the answer is likely no. In this second case, the impacts of visitor spending should be excluded from the analysis.

Because the impacts of visitor spending are likely to be small when compared to the contribution of basic university operations, excluding the impacts of visitor spending from a university contribution study is not likely to greatly affect the overall results of the study.

If visitor spending is included in a study, purchases of tickets and concessions at university events should be excluded from the analysis of visitor spending because their impact is already included in the calculation for university operations.

Method. The impact of visitor spending on the local economy can be calculated in five steps:

1. Collect detailed information on visitor spending.
2. For each service, multiply how much they paid for the service by the industry's multiplier.
3. For each good, calculate the margins and producer value.
4. For each local industry involved in the supply of each good, multiply the margin or producer value by the industry's multiplier.
5. Sum the results from steps 2 and 4.

Example. Consider the case where the university has collected information on visitor spending in the region. The university is a major tourist attraction and consistently draws many visitors to the region through its sports program. The university would like to calculate the impact that visitor spending has on output in the region. Most retail items purchased by the visitors are produced outside the region.

Table 11 shows the information collected on visitor spending. Retail sales include purchases on clothing, so retail margins need to be calculated to show the impact that these sales have on local economic activity. Purchases made at the university-operated bookstore are excluded from the analysis because their impact has already been accounted for in the contribution of university operations.

Table 11
Visitor Spending
[Thousands of dollars]

	Local spending
Lodging	790
Restaurants	935
Shopping	300
Total	2,025

Table 12 shows the retail margin and purchaser value for clothing. The retail share at the national level is calculated by dividing the national wholesale margin by the national purchaser value.

Table 12
U.S. Retail Trade Margin

	Retail margin (millions of dollars)	Purchaser value (millions of dollars)	Retail share
Clothing	107,721	265,084	0.41

Source: Commodity Composition of Personal Consumption Expenditures (PCE), Bureau of Economic Analysis.

Because retailers are the only local businesses involved in the supply of clothing, only a retail margin needs to be calculated. Table 13 shows the estimate of the local retail margin that is derived by multiplying the purchase price times the national retail shares calculated in table 12.

Table 13
Local Retail Trade Margin

	Local retail purchase (thousands of dollars)	U.S. retail share	Local retail margin (thousands of dollars)
Clothing	300	0.41	123

Table 14 shows how the total impact of visitor spending is calculated. The local purchases in the second column are multiplied by the corresponding multiplier in the third column to generate the output impact in the final column. In the case of retail trade, the impact is equal to value of the retail trade

margin times the retail trade multiplier. The total impact related to visitor spending represents the sum of the output impacts for each industry.

Table 14
Multiplied Effect of Visitor Spending

[Thousands of dollars]

	Local purchase	Output multiplier	Output impact
Lodging	790	1.9480	1,539
Restaurants	935	2.0226	1,891
Retail trade	123	1.9390	238
Total	1,839	—	3,668

The results indicate that the biggest economic impact that visitors have on the economy is related to spending at restaurants. Even though the analysis appropriately considers only the retail margin for purchases of clothing, the high margin on these goods produces a notable impact on the local economy.

Tying It All Together

There are a number of ways in which the results of a contribution study can be transparently presented and analyzed to allow readers to check the reasonableness of results.

Summing results

The economic contribution of a university on a regional economy can be derived by summing the results for each university-related activity. Separately identifying the contribution for each university-related activity helps readers evaluate the reasonableness of results.

Example. Table 15 presents the main results for the contribution study. The contribution made by each university activity is presented separately. This makes it clear that university operations, capital spending, student spending, and visitor spending are all included in the study.

Table 15
Multiplied Effect of University-related Activities

[Millions of dollars]

	Initial impact	Total
University operations	600.0	1,297.0
Capital expenditures*	2.3	4.4
Student spending*	5.3	9.8
Visitor spending*	1.8	3.7
Total	609.5	1,314.9

*Because none of the goods in these categories were produced in the area, local demand consists of only the related trade margins.

The largest contribution the university makes to the local economy is related to the basic operations of providing educational and student services. Even though capital expenditures, student spending, and visitor spending contribute to local economic activity, their combined contribution is much smaller.

Implicit multiplier

For output, this multiplier is calculated by dividing the sum of the total impacts by the sum of the direct spending. When summing the direct spending related to capital expenditures, student spending, and visitor spending, only the trade margins for goods that were not produced in the region should be used.

The value of this multiplier typically falls within the range of 1.0 to 2.5. A value of 2.5 implies that each dollar of direct spending for the university-related activities results in \$1.5 of additional spending in the region.

Example. The implicit output multiplier based on the information provided in table 15 is 2.16. This value is calculated by dividing the total output impact (\$1,314.9 million) by the local demand (\$609.5 million).

Regional comparison

A comparison of the study's results to the region's gross domestic product (GDP), earnings, and employment is a useful exercise. To make the comparison with region's GDP, results need to be based on value added multipliers. To make a comparison with regional earnings or employment, results need to be based on earnings or employment multipliers.

These comparisons act as a check on the soundness of the study's result and provide a frame of reference. Knowledge of the study region's economy is also important. What may seem to be too large of a contribution in a large metropolitan area, may seem to be too small of a contribution for a small university town.

Concluding Remarks

The case studies in this paper are intended to promote the use of best practices when conducting university economic contribution studies. The case studies also suggest a framework for presenting results in a way that promotes transparency and provides answers to some of the more commonly asked questions used for determining whether the results are sound (see Appendix).

Four separate types of university activity can be assessed with a regional I-O model—university operations, capital investment, student spending, and visitor spending. University operations, which usually make up the largest contribution to a region, consist of the provision of both educational and student services.

When using a regional multiplier for universities to estimate the contribution of university operations, a measure of university output is needed. This measure is best calculated by summing the university's non-investment expenses.

The economic impact related to spending on new construction, equipment, and software needs to be estimated separately to be considered in a university contribution study. The impact of these investment purchases should also account for the possibility that they are not produced in the region. This possibility can be addressed by using only the trade margins to calculate the impact of these purchases.

Economic impacts related to student spending are best addressed through the use of detailed information on the types of goods and services that the students purchase. The impact of these purchases should also account for the possibility that the purchased items were not produced in the study region. Care should also be taken to ensure that student services, such as university housing or meal plans, are excluded from this portion of the analysis because they have already been accounted for in the university's basic operations.

Economic impacts related to visitor spending might be appropriate for inclusion in a university contribution study. The appropriateness of using this spending depends on whether it is reasonable to expect that some jobs and businesses would not be present in the absence of visitors to the university.

Transparency can be encouraged by separately showing impacts for each university-related activity that is included in the contribution study. Separately showing how each impact is calculated not only shows the activities that are included in the study, but it also shows how the results were calculated and how they compare to each other.

Finally, the results of the study can be compared to local measures of economic activity, such as gross domestic product or personal income. This practice can shed light on the relative importance of the university to the region and further corroborate the results of the study.

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Appendix: Questions to Consider When Reviewing University Contribution Studies

If the results of a university contribution study are well presented, you should be able to find the answers to the following questions. These questions are intended to ensure that best practices have been considered.

General Questions

What economic activities are included in the analysis (*e.g.*, university operations, capital investment, student spending, or visitor spending)?

Are any contributions to the local economy that are measured by something other than an I-O model (*e.g.*, downstream benefits, returns to human capital, cultural amenities) separately identified?

How are the “indirect” impacts defined (*e.g.*, upstream, downstream, or a combination of upstream and downstream)?

What geographic region is used to measure the university’s contribution?

Are the results reasonable given the size and structure of the regional economy?

University Operations

Are expenses used to measure the general operations of the university, and are these expenses used with a single multiplier for universities?

Do the operating expenses include spending by the university related to student services (*e.g.*, on-campus housing, cafeterias, university-run bookstores, and sports programs)?

Are the operating expenses adjusted to avoid double counting the impact of local households?

Are expenses related to the operation of a university hospital separately identified, and are these expenses used with a single multiplier for hospitals?

Capital Investment

Is the impact of university spending on new construction, equipment, and software separately estimated?

Are trade margins considered when calculating the impacts purchases of new equipment or software?

Student Spending

Is the impact of student spending based on survey data that separately identifies the types of goods or services that students purchase, and is this information applied to the appropriate multiplier?

Is student spending adjusted to avoid double counting the impact of local households?

Is student spending on university room and board excluded from the analysis to avoid double counting?

Are trade margins considered when calculating the impacts of retail sales?

Visitor Spending

Is visitor spending on only long-term or frequently reoccurring events included in the analysis?

Is the impact of visitor spending based on survey data that separately identifies the types of goods or services that are purchased, and is this information applied to the appropriate multipliers?

Is the spending of visitors from outside the region the only spending that is considered?

Is visitor spending on university-operated events (*e.g.*, sporting events, museum exhibits) excluded to avoid double counting?

Are trade margins considered when calculating the impacts of retail sales?