ECONOMIC ENGAGEMENT FRAMEWORK

Economic Impact Guidelines

DECEMBER 2014

KNOW • MEASURE • TELL • ENGAGE

ASSOCIATION OF PUBLIC & LAND-GRANT UNIVERSITIES

ASSOCIATION OF AMERICAN UNIVERSITIES AAU 1900

Acknowledgements

Many individuals and organizations have contributed to the work described in this publication. APLU and CICEP are grateful for and wish to recognize the contributions of the following.

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On May 3, 2013 in Washington, D.C., AAU and APLU hosted a workshop to present many of the ideas expressed in this publication. The following individuals served as presenters at this workshop.

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About APLU

The Association of Public and Land-grant Universities (APLU) is a research, policy, and advocacy organization representing 238 public research universities, land-grant institutions, state university systems, and affiliated organizations. Founded in 1887, APLU is North America's oldest higher education association with member institutions in all 50 U.S. states, the District of Columbia, four U.S. territories, Canada, and Mexico. Annually, APLU member campuses enroll 4.8 million undergraduates and 1.3 million graduate students, award 1.2 million degrees, employ 1.4 million faculty and staff, and conduct $41.4 billion in university-based research.

APLU's membership includes 209 campuses and 24 university systems, including 75 U.S. land-grant institutions. The association's membership includes 23 historically black colleges and universities (HBCUs), of which 21 are land-grant institutions (19 under the 1890 Morrill Act, 2 under the 1862 Morrill Act). In addition, APLU represents six related higher education organizations, including the American Indian Higher Education Consortium (AIHEC), which serves the interests of the nation's 33 American Indian land-grant colleges.

In 1963, the American Association of Land-Grant Colleges and Universities merged with the National Association of State Universities to form the National Association of State Universities and Land-Grant Colleges. On March 30, 2009, the association adopted the name Association of Public and Land-grant Universities or APLU (the name of each letter is pronounced).

Founded in 1887, APLU is North America's oldest higher education association, with member institutions in all 50 states, the District of Columbia, four U.S. territories, Canada, and Mexico.

Today, APLU is dedicated to advancing learning, discovery and engagement. The association provides a forum for the discussion and development of policies and programs affecting higher education and the public interest.

Learn more about APLU at **www.aplu.org.**

About AAU

The Association of American Universities (AAU) is a nonprofit 501(c)(3) organization of 62 leading public and private research universities in the United States and Canada. Founded in 1900 to advance the international standing of U.S. research universities, AAU today focuses on issues that are important to research-intensive universities, such as funding for research, research policy issues, and graduate and undergraduate education.

AAU member universities are on the leading edge of innovation, scholarship, and solutions that contribute to the nation's economy, security, and well-being. The 60 AAU universities in the United States award nearly one-half of all U.S. doctoral degrees and 55 percent of those in the sciences and engineering.

AAU programs and projects address institutional issues facing its member universities, as well as government actions that affect these and other universities.

AAU works to maintain the productive partnership between the nation's research universities and the federal government. The major activities of the association include federal government relations, policy studies, and public affairs.

Learn more about AAU at **www.aau.edu.**

About CICEP

APLU's Commission on Innovation, Competitiveness, and Economic Prosperity (CICEP) was created to help leaders of APLU member universities—including presidents and chancellors, senior research officers, provosts, other officers and their staffs—plan, assess, and communicate their institutions' work in local and regional economic development. CICEP's Strategic Framework is built around four areas of work:

ECONOMIC ENGAGEMENT LEADERSHIP. CICEP leads APLU efforts to promote, facilitate, support, and communicate about university economic engagement.

NATIONAL RESOURCE. CICEP is a nationally recognized resource for sharing best practices in economic engagement among public research universities' officers and their teams. Themes for best practices include leadership engagement, innovation, entrepreneurship, technology transfer, commercialization, education and talent development, and cultivation of place in regions. CICEP also coordinates development of new tools and resources for public research universities to better measure their activities and contributions to the local, state, regional, and national economy.

CONVENER OF PARTNERSHIPS. CICEP acts as a key convener and collaborator to develop strong connections and partnerships among leadership of APLU member universities and with external partners from industry, government, and other science, research, and economic development focused organizations.

CICEP was created to help leaders of APLU member universities plan, assess, and communicate their institutions' work in local and regional economic development. CICEP's Strategic Framework is built around four areas of work.

COMMUNICATION STRATEGIES. In consultation with university leaders and staff members responsible for economic engagement efforts, CICEP develops communication strategies to bring greater clarity and visibility to university economic development work. Strategies emphasize deepening industry, government, and public commitment to our universities and their role in economic prosperity.

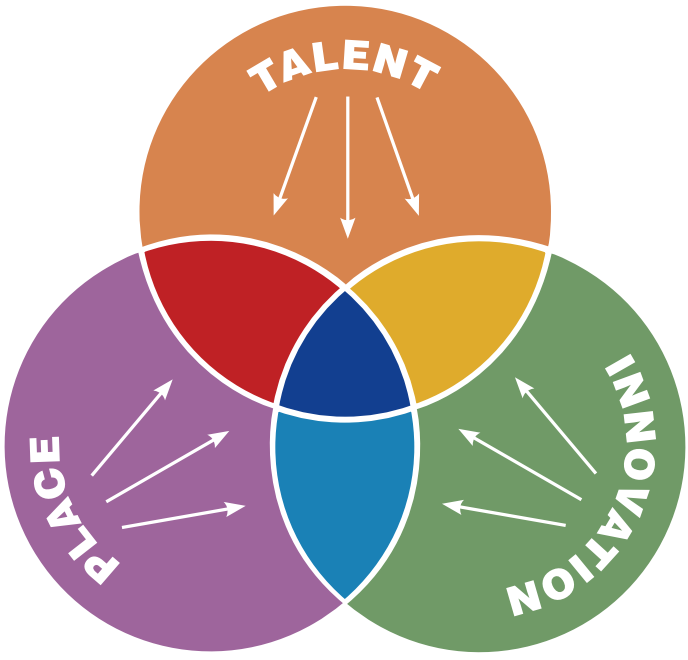
Note: In December 2018 CICEP and the Council on Engagement and Outreach integrated to form the Commission on Economic and Community Engagement. Learn more at **aplu.org/CECE.**

University Contributions to the Economy
TOWARD A TAXONOMY

APLU's Commission on Innovation, Competitiveness, and Economic Prosperity (CICEP) views university contributions to the economy across a spectrum of activity—from educating students and creating the talent necessary for the 21st century workforce to developing innovation ecosystems and entrepreneurship, to enhancing social, cultural and community development. University contributions across this spectrum are summarized in the diagram below as Talent, Innovation, and Place. Note the arrows in the diagram, meant to communicate our belief that working toward the areas of overlap leads to a higher scale of impact of university economic engagement activity.

CICEP is interested in developing a taxonomy to describe the array of university economic engagement efforts. The top-level categories for this taxonomy would be the three circles in the diagram. Four additional categories would be named for each of the areas of overlap (talent + innovation, innovation + place, place + talent, and talent + innovation + place). We hope to include a complete version of the taxonomy in a future version of this publication. Meanwhile, we welcome your ideas and input on this taxonomy.

Visit **www.aplu.org/APLUtaxonomy** to review drafts of the taxonomy as we develop it, and to provide input on the taxonomy through a brief web-based survey.



The CICEP Economic Engagement Framework

The economic impact guidelines make up one part of a wider set of tools that has been developed by CICEP. Some of these tools are available now and others are still under development. As the Commission disseminates these tools and receives feedback, we will continue to re-design and develop as appropriate.

Please be sure to visit the CICEP Economic Engagement Framework web page at **www.aplu.org/APLUframework** to provide us your feedback on the assessment tools and the other Economic Engagement Framework tools.

Universities focus their efforts not only on telling their economic engagement story well, but also growing, improving, and advancing their economic engagement enterprise.

Know, Measure, Tell, Engage

APLU's member institutions are increasingly being asked to demonstrate their economic value and relevance. Among those APLU members participating in CICEP, we frequently hear that we simply do not do a good enough job in telling our story. We are so focused on carrying out the learning, discovery, and engagement missions of our institutions that we do not take the time to frame our contributions in terms of the economy and a larger socioeconomic context.

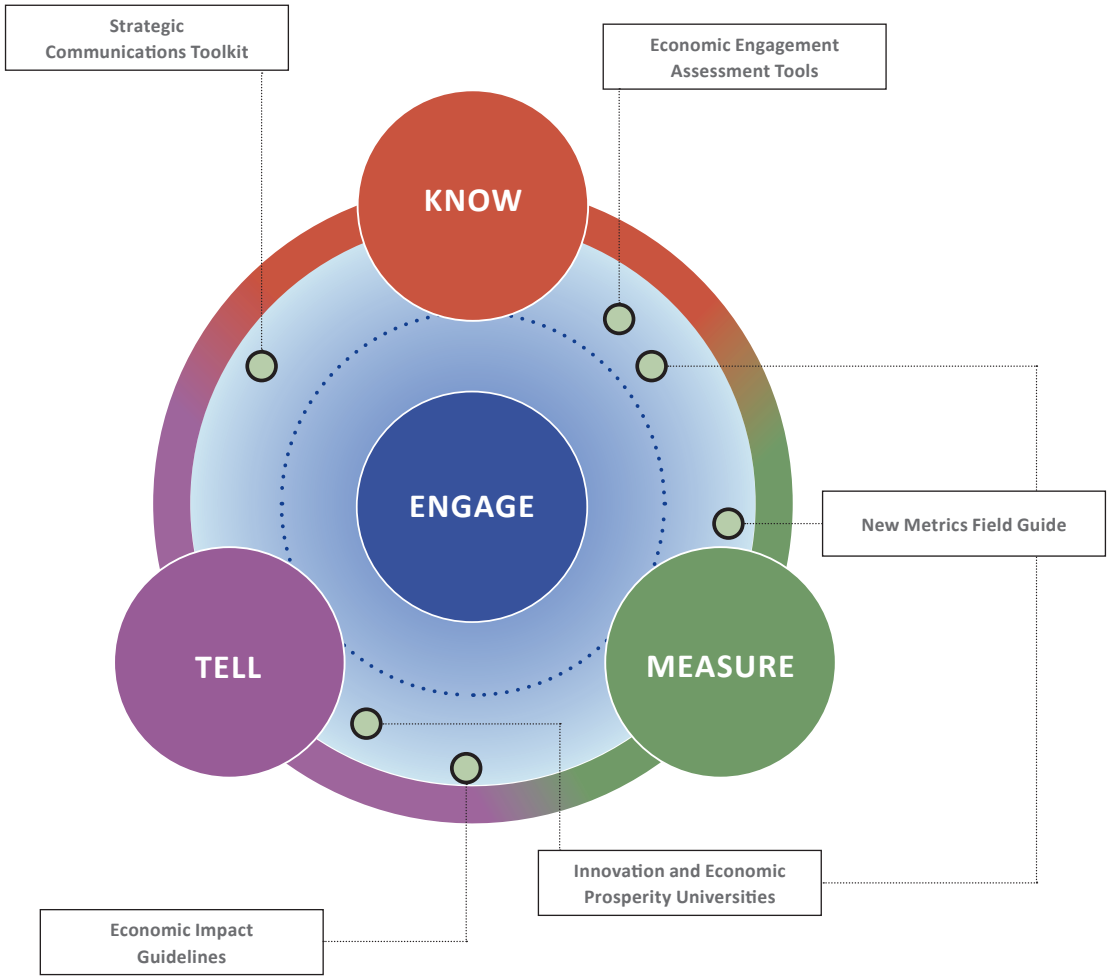
CICEP has been working for the last number of years on developing several tools in an attempt to help universities focus efforts not only on telling their economic engagement story well, but also growing, improving, and advancing their economic engagement enterprise and thereby accelerating economic development in their regions, nationally, and globally. The framework has at its core four simple ideas:

1) institutions should **KNOW** what they're doing well and what they need to improve with regard to economic engagement;

2) institutions should be able to **MEASURE** the extent to which they are engaged;

3) institutions should be able to **TELL** the story of their contributions to economic development, and

4) institutions must **ENGAGE** with external stakeholders throughout the processes of knowing, measuring, and telling in order for their contributions to have meaningful impact.



The suite of tools in the CICEP Economic Engagement framework helps each of these aspects—Know, Measure, Tell, and Engage. Examples:

- The Assessment Tools **(www.aplu.org/APLUAssessmentTools),** for example, help leaders understand (**KNOW**) their university's strengths across a set of about 40 characteristics of economically engaged universities, and where improvements can be made. University leaders can build on this knowledge by setting priorities and planning further engagement.
- The CICEP New Metrics Field Guide **(www.aplu.org/APLUNewMetrics)** can help leaders identify the right measures and indicators to gauge the success of their economic engagement (**MEASURE**) and also helps them communicate (**TELL**) their story.

More information about each of the tools, and where they fit in the framework, is included below.

- As mentioned above, the Economic Engagement Assessment Tools **(www.aplu.org/APLUAssessmentTools),** comprising about 40 characteristics, help universities assess their own performance, and also provide opportunities for external stakeholders to provide input, regarding the university's economic engagement.
- The APLU New Metrics Field Guide **(www.aplu.org/APLUNewMetrics)** helps economic engagement leaders identify the right measures and indicators to use in evaluating the success of their economic engagement.
- The Economic Impact Guidelines **(www.aplu.org/APLUImpactGuide)** offer ideas about the best approach to assessing the economic impact of universities, with an emphasis on the use of input-output models, and can be employed in conjunction with a discussion on broader impacts.
- The Strategic Communications Toolkit provides resources to help economic engagement leaders work with university strategic communications, community relations, and government relations offices to shape messages about the university's contributions to the economy, and to deliver those messages to key audiences.
- APLU's new Innovation and Economic Prosperity Universities designation and awards program **(www.aplu.org/IEP)** has become the primary dissemination mechanism for the CICEP Economic Engagement Framework, and participation in the program is in itself a tool that universities can use in knowing, measuring, telling, and engaging. Participating universities can make use of other tools as part of an economic engagement self-study, and also demonstrate engagement with external stakeholders on key issues.

All these tools help universities understand the institution's accomplishments in economic engagement, identify areas for improvement, and communicate it effectively with various stakeholders.

We encourage you to visit the APLU website **(www.aplu.org/EEF)** and explore the tools in the framework more closely.

Which Tools?

The tools included in the CICEP Economic Engagement Framework work well when used together as part of a larger set of university efforts to define, plan, assess, and communicate about economic engagement efforts. They also work well as stand-alone tools to help you focus on a specific goal. Here are some scenarios that might sound like your institution, and recommended tools.

Our university is still figuring out what we mean by "economic engagement," and trying to get a handle on all of the things that we do with regard to contributing to regional and national economic development.

- **ECONOMIC ENGAGEMENT ASSESSMENT TOOLS.** Use the self-study tool to engage people from across the campus who are involved in economic engagement; use the categories in the tool and responses on the "performance" scale to guide decisions about priority focus areas.
- **NEW METRICS FIELD GUIDE.** Use the field guide to find measures and metrics that might align with the kinds of contributions your institution is making or would like to make. Begin conversations among the appropriate departments on campus about what data are already available for the measures of interest, and what will be required to begin and maintain data collection where necessary.
- **INNOVATION AND ECONOMIC PROSPERITY UNIVERSITIES DESIGNATION PROGRAM.** We have found that institutions benefit from a structured program that requires a self-study on economic engagement to catalyze interest on campus. Participation in the IEP Universities designation program can be such a catalyst.

We have a pretty well defined economic engagement enterprise—we know what we're doing but we want to get a better handle on how well we're doing it, and we want to set some goals for improvement.

- **NEW METRICS FIELD GUIDE.** Use the field guide to find measures and metrics that might align with the kinds of contributions your institution is making. Prioritize campus efforts to collect data on these measures. Set goals for improving institutional measures.
- **ECONOMIC IMPACT GUIDELINES.** Perhaps your institution is planning to undertake an economic impact study, and the Economic Impact Guidelines provide expert help for such an undertaking. Even if you're not planning to undertake a study, however, the Guidelines can help your institution identify the kinds of impact the university is having, and consider ways to best measure these impacts.
- **INNOVATION AND ECONOMIC PROSPERITY UNIVERSITIES DESIGNATION PROGRAM.** Again, the structured IEP Universities designation program requiring a self-study on economic engagement can help focus institutional efforts on identifying areas of impact and considering appropriate measures.

Our university needs to better understand what our external stakeholders are looking for from us with regard to economic engagement, what they think we're doing well, and what priorities we should establish moving forward.

- **ECONOMIC ENGAGEMENT ASSESSMENT TOOLS.** Use the stakeholder input tool to find out what your external stakeholders think about your institution's economic engagement efforts. Find out what your external stakeholders think the university is doing well, and also what they think should be the main priorities.
- **INNOVATION AND ECONOMIC PROSPERITY UNIVERSITIES DESIGNATION PROGRAM.** The IEP Universities designation program requires stakeholder engagement as part of the application preparation process. Use this program as an opportunity to plan and implement some focused stakeholder engagement around these issues.

We simply need to better communicate what our university is doing and the contributions we are making.

- **ECONOMIC IMPACT GUIDELINES.** The Economic Impact Guidelines provide a variety of ideas about how best to tell your university's economic engagement story. It focuses on how you define and communicate about impact—whether through a traditional input/output economic impact study, or a variety of other ways to highlight impact.
- **STRATEGIC COMMUNICATIONS TOOLKIT.** The Strategic Communications Toolkit will give you ideas about how your university can tell its story. The Toolkit includes examples from other universities as well as suggestions for developing messages.
- **INNOVATION AND ECONOMIC PROSPERITY UNIVERSITIES AWARDS PROGRAM.** If your institution has already garnered the IEP University designation, you qualify to participate in the awards program of the same name. Developing your award application will encourage you to refine some of your institution's success stories, and if you win an award you will have another success to talk about!

Chapter 1

Tailoring the Toolbox

Selecting Appropriate Measures of Economic Impact to Tell the University's Story

JANET M. WEISENBERGER, THE OHIO STATE UNIVERSITY

The mission of public and land-grant universities (and, to a substantial degree, private universities) has changed in recent decades to include a charge to enhance the regional economy of the states in which these institutions are located. This shift in mission has prompted universities to employ a variety of measures of economic impact in an attempt to measure and communicate their importance to a region's economy.

Models that generate multipliers to yield estimates of an entity's economic impact, such as input-output analysis methods, provide one way to assess university contributions to a regional economy. However, the misuse of traditional economic impact analyses has created a situation where any use of such models is suspect.

Many universities have turned to less prescriptive ways to report their economic value to their communities. However, complete avoidance of traditional economic impact analyses eliminates an important way that universities can tell their economic engagement story. There can be considerable utility to a university from performing an economic impact analysis. Not only does such an analysis capture economic influence in a way that many other analyses do not, but it also can be very useful to the university in strategic planning for future activities and initiatives.

At the present time, a myriad of economic value measures are in use. Although this situation makes it difficult to measure progress over time and to differentiate among institutions on some more standard economic impact scale, it is not entirely a bad thing. Because many aspects of a university's involvement with its community and region are very specific to individual institutions and regions, a "one size fits all" approach does not serve all universities equally. Indeed, one motivation for the 2006 establishment of APLU's Commission on Innovation, Competitiveness, and Economic Prosperity (CICEP) was to create a set of common measures that could help to tell the economic impact story. In bringing a focus to the expanded economic impact mission of public universities, the goals of CICEP included a sharing of best-practice and novel ways in which universities were changing regional economies, as well as the creation of a set of tools for quantifying and enhancing the ways in which universities could affect regional stakeholders. The RIMS II multiplier models discussed in this guidebook are one tool for such quantification. A set of alternative metrics proposed by CICEP (see the APLU New Metrics Field Guide **www.aplu.**

org/APLUNewMetrics) offers other tools. Pictorial representations, such as that employed by the University of Missouri system **(www.umsystem.edu)** provide yet another type of tool.

Traditional input-output models can provide an impressive assessment of a university's economic footprint in a region, if used correctly. The next chapter of this guidebook provides potential users with the guidance needed to ensure correct implementation. But creating a truly powerful story of how a university enhances the regional economy need not stop there, and in fact, because the RIMS II models do not include some important and quantifiable indicators of economic value, the story would be incomplete if only traditional input-output models were reported. Thus, the use of other tools, together with traditional models, allows the creation of a much more complete and informative assessment of economic activity generated by a university.

APLU's Economic Engagement Framework **(www.aplu.org/EEF)** (described on pages viii–x of this guidebook) offers a number of suggested measurements and tools for universities that wish to tell more powerful stories. The remaining tools include Assessment Tools **(www.aplu.org/APLUAssessmentTools)**, which can be used to gauge areas of strength as well as areas for improvement in regional impact. In addition, a set of alternative metrics—the APLU New Metrics **(www.aplu.org/APLUNewMetrics)**—has been developed with input from the CICEP community. These alternative metrics attempt to quantify the ways in which universities impact regional economies, but which are not captured in a standard economic impact analysis. These metrics include such things as the average wages of alumni living in the state, an impact not seen in input-output analyses.

Taken together, the APLU Economic Engagement Framework contains a wealth of resources that can help university leadership to tell a comprehensive and powerful economic impact story. Not every university will find every technique or measurement useful in crafting its own story, and a judicious selection of items tailored to meet the needs of an individual university will likely have the greatest utility for an institution. However, in the picking and choosing of measures, care should be taken to consider how the various pieces in the toolbox should and should not be used. As noted previously, input-output models are not appropriate for some kinds of analyses, and universities must maintain credibility by using these models, as well as the other tools, correctly and in the appropriate circumstances. In addition, the typical considerations in strategic messaging (e.g., tailoring the message to the audience) should be observed. In this section, some of these more general considerations are discussed, and a few examples of how aspects of the CICEP tools could be used to craft strong economic impact messages are provided.

General Considerations in Crafting an Economic Impact Message

1. What is the message to be conveyed?

The first consideration in selecting appropriate measurement tools is the question of the message that a university wishes to convey. On the surface, this seems obvious. However,

there are many communicators within most large universities, and the messages that are crafted and disseminated can sometimes be sufficiently discrepant and confusing that they work to the overall detriment of the institution. At many universities, there is a comprehensive communications strategy for the institution that attempts to manage the cacophony that can result from multiple communicators. Such a strategy has a priority list of core messages that the university wishes to convey. While it is important to be cognizant of the core messaging strategy of the university, if one exists, it is even more important not to include core messaging that is irrelevant to the content to be conveyed, because gratuitous inclusion of irrelevant core sub-messages can serve to discredit the entire message.

Even at universities that do not espouse a single common communications strategy and core messaging, there are university priorities and new initiatives that should be taken into account when devising an economic development message. These initiatives can be around industry-university partnerships, commercialization ventures, new academic or research internal investments, etc. The selection of metrics to include in the message should fit with and underscore the university's big initiatives, points of pride, or reputational signature, wherever appropriate. Again, the caveat is that credibility is paramount in any such messaging, and that sub-messages not be tacked on gratuitously.

2. Who is the audience?

A second and critically important consideration is the audience to whom the communication is directed. Universities have many stakeholders, and the metrics that are chosen for a message must be ones that the selected audience will understand and respond to. Universities, and their faculty members, can be myopic when attempting to talk about accomplishments and achievements. Working within the academic walls often creates an inwardly-focused view that the things that are important to us will be equally important and valued by external constituencies. It could be argued that such inward focus has been a major contributor to the dismissal of the value of university education in the popular media. Failure to tell a compelling story that resonates with the public provides the opening to focus on the costs of education, rather than the value provided by universities.

Such short-sightedness of perspective can even occur when communicating within the institution. When administrators wish to communicate to their own faculty and staff, there is often a lack of understanding of the differing priorities of these groups. A similar caveat applies when communicating to students. Expanding communication efforts outside the university to close constituencies such as parents and alumni requires additional care. Potential donors pose a particular challenge, as many development professionals can attest. Industry leaders often require communications with yet a different approach. And messages targeted to government officials can vary widely, depending on the level of the government entity—local, state, or national. For each of these groups, metrics for inclusion in the message should be carefully selected.

It is important for university communicators of economic impact messages to understand that the message needs to be specifically tailored for the intended audience in order for it to be effective. Asking the question, "Will this constituency care about this particular

metric?" is critical in crafting a message that will be positively received. In order to answer this question accurately, conversations and interactions with various stakeholder groups, on a regular basis, are extremely helpful. Below are a few examples of metrics that might be effective with particular stakeholder groups.

3. Is it better to message with partners?

A third consideration in crafting an effective economic impact message is whether there is value in partnering to create a common message. In some cases, institutions with similar missions and activities can collaborate on an economic impact message to create a much stronger impression in regional constituencies. These collaborators can be selected to emphasize the contributions of institutions within a state, within a region, within a particular established "conference" of institutions, or across the nation. In any given situation, care should be given to determining what set of collaborators might create the most effective communication. For example, messages from a university system (e.g., University of California, University of Texas) might make a stronger impression than messages from the individual universities within the system. Similarly, messages from a group of universities within a state (e.g., University of North Carolina, North Carolina State University, and Duke University) can make a powerful statement. With a broader regional focus, a message from a conference, such as the Committee on Institutional Cooperation (CIC), which represents the Big 10, can appeal to stakeholders from the entire Midwest and beyond.

4. What measures are appropriate?

After answering the questions listed above, one caveat remains in determining the metrics and measures that might be included in an economic impact message. Selection of metrics that incorrectly portray the nature of the economic activity are likely to lead to loss of credibility in the same way that the improper use of the RIMS II models did. Thus, it is very important to understand the metrics that are selected, and to ensure that they do not misrepresent the facts that form the basis of the message. It is very common for university leaders to use the terms "leverage," "return on investment," and similar language unknowingly or carelessly. Although this is probably not harmful in most situations, using economic impact terminology correctly ensures credibility in messaging, even when the audience includes economists.

In the next section, a few examples are offered, describing how metrics might be selected for inclusion in economic impact messages after answering the questions posed above.

Examples of Economic Impact Messaging

1. Aligning with Institutional Priorities

Most universities have one or more big initiatives underway at any given time. The potential economic value and growth over time of these big initiatives can be messaged by selecting the appropriate metrics. The University of Illinois, for example, is in the midst of a faculty hiring program, dubbed the Illinois Strategic Excellence Hiring Program, designed to bring

top academic talent to the campus. This program focuses hiring clusters in four targeted areas: Information, Technology and Society; Human Health and Wellness; Energy and Sustainability; and Culture, Communication, and Global Issues. These target areas were selected based on an assessment of the university's strengths, both on the national and international scales. Similar initiatives are underway at other universities. At Ohio State University, the Discovery Themes initiative targets a large number of new faculty hires in three areas: Food Safety and Security, Health and Wellness, and Energy and Environment. To make the case for existing strength in these areas, and to measure the improvements in these areas resulting from the new faculty hires, metrics are chosen, some of which measure value to the economy, such as research expenditures in a target area (e.g., health and wellness), or number of patents and startups in a target area.

Large faculty hiring initiatives are often not viewed as tools for economic development by the larger community. However, as these faculty train students who can contribute to the regional workforce, generate groundbreaking research that can lead to applications with commercial relevance, and attract new companies and talent to the region, the impact of such programs may be considerable. To ensure that such large university initiatives are well understood by the community in terms of their impact on economic development, other metrics of progress over time could be included in an evaluation plan, including wages of alumni in state, number of industry-sponsored research projects, number of student internships, number of university-based startups, etc.

2. Targeting the Audience

For state and regional governmental entities, a comprehensive understanding of the economic impact of a university on the region can lead to better support for the university's programs and initiatives. These constituencies are exactly the ones with which a traditional input-output economic impact analysis might be most appropriate. One example of a comprehensive analysis is that of Louisiana State University (LSU), which houses a Division of Economic Development that prepares a statewide economic forecast for industries in Louisiana. LSU releases an annual report on the economic impact of the university on the region. In their annual reports, the LSU group uses RIMS II modeling and multipliers to estimate a total economic impact on the Baton Rouge region. They take a conservative approach, excluding, for example, student spending by students whose permanent residence is in the region. In their 2011 report,[1] the group estimates the total LSU impact to be approximately $1.3 billion, a number that includes student spending, university operations, athletic department impacts, and capital improvement expenditures.

However, the group also uses this report to incorporate other metrics of LSU impact, including information about the total number of students enrolled, the top-ten ranking of the LSU College of Business MBA program in drawing corporate recruiters, and the top national ranking of the landscape architecture program. These items are used to underscore the statement that the presence of LSU in Baton Rouge makes the area a very attractive place to

1 Barnes, S.R. and Terrell, D. (2011). The Economic Impact of Louisiana State University on the Baton Rouge MSA. Available online: www.lsu.edu/ur/ocur/lsunews/MediaCenter/MediaImages/2011/02/item25534.pdf

study, work, and live. By combining the traditional economic impact analysis approach with these other points of pride, LSU creates a powerful message of economic importance.

Other constituencies might be more receptive to a different set of metrics altogether. Parents of prospective students, for example, might be very interested in the availability of internship programs for students, or data on the number of students going on to graduate programs, whereas some industry leaders might have greater interest in technology transfer metrics such as the number of patents filed, the number of invention disclosures, or the number of university-fueled startups. Still other industries might find a large number of patent findings less attractive, and respond better instead to data on the dollar amount of industry sponsored research at the institution. Ohio State University, for example, publishes a national map of its industry partners, with a listing of the partners in each state (and region of the state within Ohio). This publication has been extremely useful in making the case to a new potential industry partner that Ohio State is a good institution to engage with in solving their research-related problems.

3. Messaging with Partners

Several examples of creative messaging with partners can be found across US public universities. One platform that has created considerable interest is Advancing Missouri, a web portal produced by the University of Missouri System that represents the four University of Missouri campuses (Columbia, Kansas City, Rolla, and St. Louis). This site was the first to present statewide data on a county-by-county basis on an interactive map, with which users can gain a small snapshot of impact by moving a mouse over a particular county. For each county, the snapshot shows the number of current university students, the number of alumni, and the dollar value economic impact of the university system for that county. In addition, a very brief story of how the university has impacted the county is presented. These stories can include such items as interactions with a company located in the county, a story about extension educators in the county, or an outstanding student from the county. This tool provides a compelling picture of the impact of the university across the state, and offers utility to state and local stakeholders and governments, as well as to alumni and parents.

Michigan's University Research Corridor **(urcmich.org)** represents an alliance of Michigan State University, Wayne State University, and the University of Michigan. Born from a realization that a joint message carries significantly more weight than an individual message, these three universities have come together to communicate the economic value of their activities across the state. In their annual reports of economic impact, they combine a statement about economic impact ($15.5 billion in 2012) with a report of research expenditures ($2 billion), and the number of degrees awarded across the three universities (31,600), to create a powerful economic message for the region. Beginning in 2012, they added an interactive state map similar to that used by the University of Missouri system, with which a user can get a short set of statistics about activity on a county-by-county basis. In the details of the report are included information about state tax revenue and direct and indirect job creation, as well as an estimate of leveraged dollars for every $1 invested by the state of Michigan in the three universities. Startup companies are also highlighted, as are patents and licenses. Further, an analysis of the additional money earned by alumni of the

universities who live in Michigan due to their college degrees and the spending of current university students are called out. This overall report contains an impressive number of statistics, accompanied with anecdotal stories about individual faculty entrepreneurs and comparisons to other research corridors across the nation.

Yet another type of effort involves the creation of searchable databases of research expertise for universities in a given region. One example, REACH NC (Research, Education, and Capabilities Hub of North Carolina, **reachnc.org**) is a web portal that represents the collective expertise of some 15 universities in North Carolina. It is designed to connect researchers at these universities with industries and companies that can utilize that expertise to enhance the economy of the state and the region. Anchored by the University of North Carolina, Duke University, and North Carolina State University, REACH NC offers users the ability to make connections with experts and access the capabilities and assets of the higher education institutions across the region. Through an interface with SciVal Experts, REACH NC also features recent grants and publications of the scientists in the database. Featured on the University Economic Development Association website **(university.eda.org)**, REACH NC has allowed users to find not only research experts for collaboration and technical assistance, but also speakers, reviewers, and mentors for a variety of events.

4. Selecting Appropriate Measures

As described above, universities have lost some messaging credibility by less-than-accurate use of economic impact analysis models. In addition, it should be remembered that terms such as “leverage” and “return on investment” can mean somewhat different things to different audiences. These terms are broadly used in all walks of life, but when an economic message is intended, care should be taken to ensure correct use of terminology. For example, the accepted finance definition of “return on investment” is the (gain from the investment minus cost of the investment) divided by cost of the investment, but this phrase is often used without subtracting the cost of the investment from the gain in the numerator. Although such omissions do not always make a large difference in the core message, regaining credibility in the economic world mandates careful attention to accuracy in any message that is disseminated.

Chapter 2

Enhancing University Impact Studies
Credibility of Analysis, Alternative Measures of University Worth

DAVID SWENSON, IOWA STATE UNIVERSITY

The Underlying Issue: The Growing Need to Profile and Promote University Economic Contributions

Universities are complicated and diverse institutions. They provide a very wide range of services, and the users and providers of those services interact with one another and with society in unique ways. Their values to the economy and to society are both tangible, in the sense that they can be quantified using a variety of conventional measures, and they are intangible in that they may infuse and enhance a city, state, or region's cultural, historical, and recreational heritage and identities.

A university's presence in a region or state may exert considerable influence on educational opportunities, as well as cultural options, recreational choices, health care, and the tone and tenor of regional economic vitality. Universities are large institutions; they employ many people, they serve even more people, and they are directly and indirectly responsible for substantial fractions of regional incomes. A university influences the types of businesses in an area, housing values, the availability of area goods and services, and private and public infrastructure investments. In short, most universities have large and lasting economic and social footprints.

Many universities have found it necessary to measure and promote their regional or statewide economic values in recent years, especially in light of tight state fiscal accounts, keen competition among service providers for scarce dollars, and increasing expectations from the public for greater accountability of public investments in education and research. The last decade has seen a proliferation of university economic impact reports.

Measuring Impacts: Applying Input-Output Type Methods to University Activities

American universities are a complicated amalgam of institutions that depend on taxpayer support, fees and charges, donations, and grants to provide:

- Higher education services
- Medical or veterinary care

- Service extension to agriculture, natural resource management, businesses, and households
- Research, product development, and technology transfer services
- Recreational, entertainment, and cultural activities

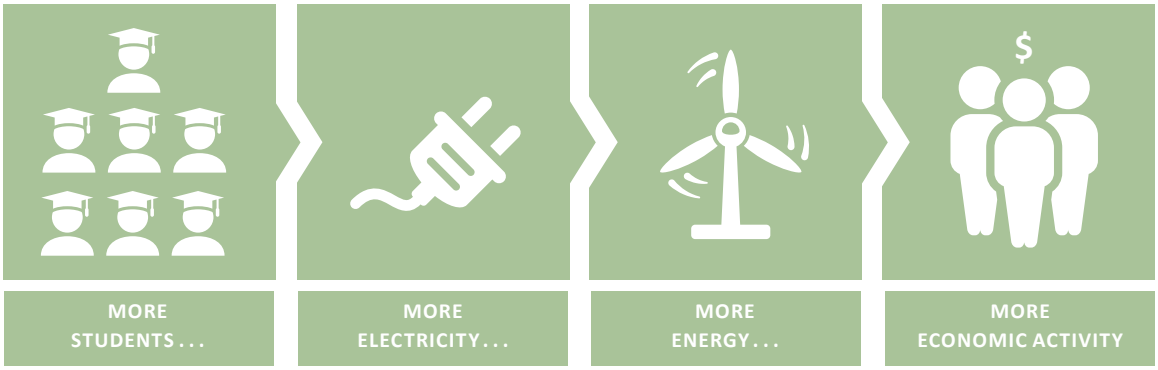
The degrees to which any given institution produces these services may vary widely, but the primary justification for our universities is to deliver higher education. In recent years, there has been a growing emphasis on identifying the economic "impacts," or, perhaps more accurately, the economic "contributions" of our universities to regional or state economies. These kinds of measures take into account not only a university's actual direct spending for payroll, goods, and services, but also consider the indirect effects a university has on in-state (or in-region) suppliers to the university, and the economic activity that emanates from university and supplying-sector employee spending as they convert their paychecks into household purchases.

If properly done, this process identifies a multiplier effect attributable to university spending in terms of total regional (or statewide) business activity, incomes to workers, and jobs that is greater than the annual outlays of the university, its staffing, and payroll. It allows officials to claim a share of regional economic potency in excess of reported annual spending, that speaks to its regional economic importance extending beyond the normal boundaries of a university's primary service and employment area. A university's multiplier effects for a region or a state are primarily determined through the use of two conventional mechanisms:

- Researchers will configure a suitably detailed input-output (I-O) model of the regional economy of scrutiny, or
- Researchers will apply a set of higher education multipliers to total university outlays or, alternatively, will apply a detailed schedule of multipliers to itemized university outlays that occur in the region.

How Regional I-O Models Work

The premise behind regional I-O models 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 energy. 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 relationships between industries and households, most regional I-O models use information from the Bureau of Economic Analysis (BEA) national industry accounts. 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).

One widely-used I-O modeling system is distributed by IMPLAN Group, LLC.[2] Their model structure allows skilled analysts to configure a study subject's (in this case a university's) industrial accounts, in a manner that is generally consistent with I-O measurement procedures. Implan has been supplying data for substate-level modeling for over 25 years, and is the most relied-upon source for I-O data among academics and government agencies. Implan models have high industrial specificity, as well as high regional specificity. There are 440 industrial sectors in the national Implan model, and study regions can be a zip-code area, a county, a combination of contiguous counties, state, state combinations, or the nation.

A common source for industrial multipliers is the RIMS II system of the BEA. RIMS II is not an I-O model; instead, the service produces for-a-fee regionally-specific multipliers from I-O models managed internally at BEA.[3] Analysts then apply the multipliers to their scenario of interest. As the BEA is the U.S.'s chief agency for compiling national industrial information, the agency periodically produces benchmark input output accounts at the national level, which serve as the technical foundation for most I-O systems used in the United States.

Whether analysts use an I-O model or a table of multipliers, it is imperative they utilize coefficients that are appropriate to the region of analysis. A researcher studying a statewide university system would use an I-O model or table of multipliers specified for that particular

2 This company was formerly known as the Minnesota Implan Group (MIG).

3 In 2015, BEA plans to release a modified economic model that will replace RIMS II. The new model will also produce regional multipliers that can be used in economic impact studies, but the input-output data will be updated less frequently. BEA will continue to make RIMS II multipliers available until the modified model is released.

state. It is inappropriate to use multipliers from another state or from the nation because there is wide variance in multipliers across states owing to their sizes and the overall mix of industries that might be found in, say, South Dakota compared to Oregon. The use of state multipliers to estimate a much smaller sub-region, or the use of national multipliers to measure a state have the effects of minimizing trade leakages and over-describing economic activity. It is also inappropriate to use some sort of single, trans-university multiplier for institutions in different states.

Choosing the Study Region

The study region consists of the geographic area or local economy for which the 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 amount of economic activity in a small college town but support a negligible amount of economic activity in a large state.

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 study 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 that encompass a cluster of industries that support a university such as a few counties surrounding a university town in a rural area may also serve as a good choice for the study region.

Scope of University Activity

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

- **UNIVERSITY OPERATIONS:** includes 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. The contribution made by a university hospital needs to be calculated separately by using multipliers for the hospital industry if their impact on the local economy is to be included in the study.

- **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. Student spending should not include tuition.
- **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, reoccurring events, this activity supports local business as visitors stay at local hotels and eat at local restaurants.

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.

The Problem: University Economic Impact Studies Are Sometimes Methodologically Indefensible

With the proliferation of economic impact studies, non-standard and questionable conclusions about university values to regional, state, and even national economic accounts have occurred. As universities vied to convey their importance, many embraced conclusions about their economic potency that extended well beyond the practical reach of university efficacy in its conventional sense. Some reports include little information on how the results are generated and the types of economic activities measured. In cases where sufficient information is provided, results may be unreasonably high if the model is not used properly. 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. I-O models also cannot be used to measure the returns to society from the development of human capital.

Siegfried, et al. surveyed the state of the art of university impact studies in 2007.[4] This well focused and to-the-point critical article was met with both consternation and concern among

4 Siegfried, John J., Allen R. Sanderson, Peter McHenry. The Economic Impact of Colleges and Universities. Economics of Education Review. 26 (2007) 546–558

organizations tasked with promoting higher education and maintaining public support for higher education policies.[5]

Siegfried, et al. were blunt in their evaluation of university economic impact efforts. After reviewing dozens of modern examples, they concluded:

5 Evaluations of higher education impacts often refer to much earlier work done in 1992 by Leslie and Slaughter. See Leslie, L.L., and Slaughter, S.A. Higher Education and Regional Development, in F. Welch & E Hanushek (eds), The Economics of American Higher Education. Dordecht: Klewer Academic Publishers. 1992.

- Evaluators and clients were prone to use inappropriately compiled data or misleading ratios and inferences when describing higher education economic importance.
- Little attention was paid to identifying and justifying the appropriate geographic territory, and evaluators sometimes failed to distinguish between the required education services to meet native demand, and education sales in excess of regional demand (i.e., the net gains in regional productivity or the actual marginal economic impacts associated with increments of higher education service).
- Inappropriate or ill-applied multipliers were frequently employed that were either not reflective of the region's economic structure, or not reflective, when applied in a detailed fashion, of the institution's actual purchasing patterns in the area economy.
- Too much effort was made trying to quantify secondary, tangential economic impacts, to include knowledge spillovers and economic activity that logically flows from a university but occurs outside of a university's traditional sphere of operations (e.g., consulting, business start-ups, etc., including enhanced community quality of life measures).
- Broadly, the authors criticized the use of inappropriate ratios (leverage levels, return on investment language, etc.) as well as confusing reporting that do not lend themselves to content clarity.
- Finally, the multitude of economic and social spillovers flowing from a university can be acknowledged and described, but may be difficult to measure with traditional impact analysis structures.

The Solution: Learning to Appropriately Represent University Economic Worth

There is a difference between measuring the total economic contributions a university makes to a state or regional economy and the estimated economic impact an institution makes. The economic impact occurs as we segregate activity that is exogenously demanded or funded, and via an appropriate measurement and modeling process conclude that it explains net gains in our regional or statewide economic accounts—that "but-for" the university's activity described, the state or regional economy would have been smaller. It is therefore not correct to claim that the total economic contribution of a university constitutes its economic impact. As it is absurd to consider a university as a "with or without" element of one's economy, it is just as erroneous to analytically pretend university economic activity is ostensibly in jeopardy of vaporizing when describing findings and imputing its value.

Analysts and promoters are also advised to not get caught up in the imprecise use of otherwise conventional social or financial measures that in fact have well defined, and consequently restrictive, meanings in public and private finance. For example, some analysts have attempted to divide the total economic output of a university considering all linkages to suppliers and university staff's household spending by the state funding to arrive at a gross "return on state investment" (ROI) ratio. Yet gross economic output is not a "return"

in any sense of the word, it is simply the identified pattern and amount of spending directly and indirectly attributable to a university. Secondly, state funding in general is not an "investment," in a traditional financial sense; the ROI term is used colloquially and often indiscriminately to infer robust returns to taxpayers.

General state funding is the use of taxpayer money to provide a wide array of public goods that have intrinsic social, economic, cultural, and human capital value. We do not invest in court services, law enforcement, prison guards, highway patrol officers, or clean air and water in hopes of a tangible financial return relative to outlays. These spending categories are classified as public goods that do not have, as measured on a gross provisions basis, market-based values. Nonetheless, promoters of universities (and state legislative funders) have become fond of the "investment" term, despite its inaccurate application to the situation that was evaluated. An investment means that we expect a monetary return that can be utilized in lieu of our original payment. Hence, ROI jargon distorts and misleads supporters, citizens, and legislators.

It is also often the case that state support of higher education is said to leverage external funds. This claim is analogous to the ROI implication. For example, state support of higher education does not leverage tuitions or federal grants in that an increase in state funding, for example, would lead to an increase in either. This causal characterization of state spending is inaccurate and should be avoided.

Another common misuse, analogous to ROI, is to imply a benefit-to-cost outcome due to university activities or services. In conventional and well-established government evaluation language, benefits have a defined meaning, as do costs. Economic benefits are agreed-upon, quantifiable, and tangible enhancements to general social well-being as a result of public spending over an extended period of time. By its very nature, there are enhancements to net social productivity attributable to institutions of higher education—education is positively and strongly correlated with higher lifetime earnings, high levels of productivity for longer periods of time, and far lower levels of lifetime social costs. This is similar to public health spending, which generates enhancements to net social productivity or well-being—vaccinations, for example, are positively and strongly correlated to longer and healthier lives. Just as we can quantify the benefits of public health programs vis a vis the costs, we can do much the same for elements of higher education.

Benefit-cost analysis is, however, an activity that is completely distinct from economic impact assessment. Economic impact studies look at the value of sets of institutional, student, and visitor activities within a circumscribed economy on, typically, an annual basis. Benefit-cost analysis is much different. It measures the value of increments to consumer or producer surpluses (benefits) over a long period of time that are meaningfully linked to discrete sets of publicly funded activities (the costs). Generally, when we have a mature system of public goods delivery, we measure benefits and costs on the margins; i.e., changes in benefits attributable to changes in costs for a particular aspect of new or revised programming.

Stated simply, benefit-cost analysis and economic impact or economic contribution analysis are two completely separate measures of the worth of institutions of higher education. The

multiplied-through output, value added, labor income, and job outcomes are not benefits within the restricted meaning in government decision making, and characterizing them as such is inappropriate.

Finally, an ersatz benefit-cost conclusion is sometimes implied regarding fiscal outcomes associated with university economic contributions. Measures of university economic contributions will occasionally include estimates of state government tax revenues that would be associated with the incomes that are directly and indirectly supported by university operations and other activities. Next, analysts compare those gross state tax receipts to taxpayer support for the university, implying that the university and all its related activities fully or significantly reimburses the state for its support. State taxes that householders pay into state accounts are in fact used to pay for the entire range of state goods and services demanded by those households. To infer full or even significant taxpayer repayment for higher education costs is highly misleading.

A Summary of Guidelines for Enhancing University Impact Study Credibility

These guidelines are distilled from an earlier report[6] generated for CICEP in reforming and improving university economic impacts studies. They also represent a basic qualitative and procedural checklist from which existing studies can be evaluated. The guidelines are subdivided into those that apply to measurement and those that apply to the reporting of findings.

When Measuring University Economic Contributions and Economic Impacts:

Any study of university economic contributions to a regional or a statewide economy must employ proper and up-to-date modeling systems:

- Are the analysts using a current I-O modeling system like Implan or its structural equivalent, or a current table of RIMS II multipliers, and
- Have the models or the multiplier tables been specified for the appropriate region of analysis?

The ability of the analyst is of primary importance in conducting university economic impact reports as the quality of the research will directly reflect on the higher institution at large:

- Do the analysts demonstrate a solid and thorough understanding of I-O methods and procedures, and
- Can the analysts adequately explain and defend findings to the public, policy makers, or the media with the kind of confidence and authority that universities expect from all of their scholars?

6 Swenson, D. (2011). Measuring University Contributions to Regional Economies: A Discussion of Guidelines for Enhancing Credibility.

A clear understanding of regional economic accounts (for example, including the ability to differentiate between economic activity that is intrinsic to a state or regional economy and that which represents net new regional or statewide productivity) is essential to producing credible studies of overall university economic contributions and economic impacts:

- Are the analysts able to clearly describe and distinguish economic activity that has occurred in the state or region "but-for" the presence of the university from the activity that would have occurred nonetheless by virtue of expected state service delivery, and
- Have the analysts carefully segregated their evaluation so that it is clear to readers which components of regional or statewide economic contribution and impact are attributable to university activities and which are attributable to the activities of students and visitors?

Extra-university spending can constitute a sizable component of the direct and indirect contribution universities make to regional economies:

- Have the researchers employed procedures that distinguish between student on-campus and off-campus spending,
- Have researchers controlled for student spending in a manner that does not double count student spending with all university spending, and
- Have researchers used defensible and statistically reliable methods to estimate the economic value of non-student visitors to the region?

When measuring a university's activities, it is useful to differentiate among its core educational activities, research and public service, its revenue-generating enterprises, and its health care or veterinary services (if appropriate) in order to properly allocate regional economic contributions and labor-related outcomes to specific university functions:

- Have researchers adequately described university expenditures in manners that suggest an awareness of the range of activities universities are engaged in, and
- Have researchers allocated university faculty and staff across those many functions to describe where the job and income-related outcomes of university spending are located?

When Reporting Economic Contribution Outcomes:

Clear and concise reporting of I-O modeling or other estimation procedures is critical to conveying an accurate understanding of the economic contribution of universities to regional or state accounts:

- Are the findings presented in a manner that allows a reader to distinguish among the components of economic activity attributable to the university, and
- Do the results and the resulting implicit or declared multipliers make sense in general?

Economic contribution analysis should use standard and straightforward language to describe the findings, and should forgo the use of private investment jargon when describing university values:

- Do the consultants lapse into discussing ROI or the leveraging value of state spending,
- Do the results improperly claim that state taxpayers, in essence, have been made whole in that university relative economic impacts generate more than enough tax revenues to cover state support, or
- Are annual economic outcomes described in a manner as to inappropriately imply net-beneficial gains to social welfare?

There are knowledge and other intangible spillovers emanating from all universities. Universities may create the conditions for entrepreneurship and enhanced regional productivity; however, measuring those regional gains or the lifetime worth of university attendance is difficult and highly imprecise, as is apportioning such measurements to particular institutions:

- Has the study attempted to impute "downstream" economic activity with the assumption that there a causality between university activities and spillover regional growth, or
- Have university researchers attempted via measures of lifetime earnings and other measures to differentiate themselves from some alternative?

University-linked incubators and business development centers are private ventures that tap into university services, talent, or knowledge spillovers. Similarly, university staff entrepreneurship produces a wide array of products, services, and contributions to regional economies:

- Have universities attempted to fold in private economic gains into their declarations of regional economic worth, or
- Have universities attempted to appropriate the value of staff entrepreneurship as a tangible output of the university?

A complete list of questions to consider when reviewing, and producing, university contribution studies is provided in the Appendix to Chapter 3.

Incorporating Alternative Measures of University Worth

I-O studies should only be used to describe ongoing university operations: current expenditures for educational, research, health care delivery, along with all other recreational and cultural activities that take place within the university's primary sphere of operation. Impact studies should not be confused with or used to replace other types of evaluation approaches. Following are several other evaluation and reporting approaches that may have appropriate places in the characterization of university activity to society.

Benefit-Cost Analysis

Benefit-cost analysis is completely different from conventional economic impact assessment, though the two are sometimes confused or conflated. Impact assessment merely measures economic activity within a region. Benefit-costs analysis, on the other hand, quantifies tangible improvements to society as a result of a particular government activity or policy change. For example, suppose a university had a program to provide an intense regime of summer classes to build the core skills of a set of entering freshmen who had historically high drop-out rates—for argument's sake, let's assume they are economically disadvantaged students. A social scientist might simply care whether the treatment influenced the likelihood of staying in school longer or of eventually achieving a degree. Policy makers, however, would want to know whether the gains to society, i.e., increased earning potential coupled with decreased social dependency outlays, outweighed the costs of the program. If, over the long run, society's gains exceed society's costs, then the program would be net beneficial to society. Accordingly, benefit-cost descriptions might be used to complement a university's declaration of social worth. Those are most valuable when describing marginal changes in university activities in demonstrating incremental gains.

Case Studies and Success Stories

There are many kinds of case studies, but in the context of university promotion, case studies that clearly profile successful university activities can often provide a better sense of the worth or implied worth of university functions or programs than can be inferred from economic impact studies. Examples of faculty, researcher, or student successes associated with particular emphases or initiatives help to introduce stakeholders to the range of socially valuable activities in which universities are engaged, as well as reinforce understanding of the unique role universities hold in society. And in the current fiscal environment, success stories emphasizing creative service delivery, assistance to other state agencies, or innovations in instructional delivery may yield robust public support dividends.

Linkages and Flows

Although financial outcomes are dominant in recent years, it is sometimes very appropriate and informative to describe the functional outcomes of university activities. For example, suppose a university was in the process of developing its capacity to engage in bio-industrial research and education. Diagrams showing the flow from on-campus programs to sets of discrete activities, which in turn might link to sets of social, environmental, or economic outcomes might better convey the value of the activity to a reader than by compiling an R&D economic impact summary.

Periodic Surveys of Alumni or Stakeholders

Properly conducted surveys can produce very valuable information and provide feedback to university planners. The results of surveys can be used to reinforce the job-getting value of higher education or particular behaviors of graduates. Surveys can help identify majors that perform better or worse in the outside economy, but those same surveys can also be used to measure the potential value of specific university activities on different life choices or other social outcomes.

Universities are also centers for health care delivery, technical services, and a range of extension-like activities. Again, properly conducted surveys can help elicit useful feedback for university planning as well as research-based conclusions about the perceived value of different types of university services.

Testimonials

There are many consumers of university services beyond students and parents. Citizens, business groups, farmers, and many other industries and occupations are also prime recipients of university services. First-person testimonials are an effective method of conveying value. In practice, testimonials can also be paired with case studies in order to better articulate a particular university practice's or activity's practical outcome.

Basic Quantifications

University activity is diverse. The products of the educational process yield a wide array of outcomes. These may be awards, scholarships, or other distinctions that can describe faculty, research staff, professional activities, and students. Tallies of distinguished outcomes have great value in conveying the socio-economic importance of universities. Likewise, the activities of students—scholastically, socially, and entrepreneurially—can be tallied or cross-tabulated to highlight services, social contributions, and accomplishments.

Chapter 3

University Contribution Studies Using Input-Output Analysis

A working paper from the U.S. Department of Commerce, Bureau of Economic Analysis

ZOË O. AMBARGIS, CHARLES IAN MEAD, AND STANISLAW J. RZEZNIK[7]

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.[8] 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.

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7 All three authors are from the Bureau of Economic Analysis (BEA). The views expressed in this paper are solely those of the authors and not necessarily those of the U.S. Bureau of Economic Analysis or the U.S. Department of Commerce. This paper is based on presentations made by the authors at a University Economic Impact Workshop sponsored by the Association of American Universities (AAU) and the Association of Public Land-grant Universities (APLU) on May 3, 2013. The authors thank session participants and their colleagues at BEA for valuable comments.

8 For a discussion of the pitfalls common to studies of the economic impact of colleges and universities, see Siegfried, John J., Allen R. Sanderson, and Peter McHenry (2007). "The Economic Impact of Colleges and Universities," Economics of Education Review, 26(5), 546–558.

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.

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.[9] 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 many 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).[10]

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

9 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.

10 For more information on how the model is created and its underlying assumptions, see Ambargis, Zoë O. and Charles Ian Mead (2012). RIMS II: An Essential Tool for Regional Developers and Planners. U.S. Department of Commerce, Bureau of Economic Analysis.

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.

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 collage 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.[11]

11 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, Zoë O., Thomas McComb, and Carol A. Robbins (2011). "Estimating the Local Economic Impacts of University Activity Using a Bill of Goods Approach", BEA Working Paper, June 2011.

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.

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.[12]

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).

12 BEA plans to treat R&D expenses as investment with the release of its 2007 benchmark I-O accounts. 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.

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.

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 $)

	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

Table 609 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

	Output (millions of $)	Value added (millions of $)	Earnings (millions of $)	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.[13]

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

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

relevant to the analysis, this accounting practice allows these for 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 $)	Purchaser value (millions of $)	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 $)	U.S. wholesale share	Local wholesale margin (millions of $)
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

	Local wholesale margin (millions of $)	Output multiplier	Output impact (millions of $)
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 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 $)	
	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 $)	Purchaser value (millions of $)	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 $)	U.S. retail share	Local retail margin (thousands of $)
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 ($539,000) 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

	Local purchase (thousands of $)	Output multiplier	Output impact (thousands of $)
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 $)

	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 $)	Purchaser value (millions of $)	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 $)	U.S. retail share	Local retail margin (thousands of $)
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			
	Local purchase (thousands of $)	Output multiplier	Output impact (thousands of $)
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 $)

	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.

Appendix to Chapter 3: 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?

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