

Pitfalls of Traditional Measures of Higher Education's Role in Economic Development*

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Abstract

This essay describes methodological approaches and pitfalls common to studies of the economic impact of colleges and universities. Such studies often claim preposterous levels of local benefits that imply annualized rates of return exceeding 100 percent. We address problems in these studies pertaining to the specification of the counterfactual, the definition of the local area, the identification of “new” expenditures, the tendency to double-count economic impacts, the role of local taxes, and the omission of local spillover benefits from enhanced human capital created by higher education, and offer several suggestions for improvement. If these economic impact studies were conducted at the level of accuracy most institutions require of faculty research, their claims of local economic benefits would not be so egregious, and, as a result, trust in and respect for higher education officials would be enhanced.

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1. Introduction

Colleges and universities often claim they contribute significantly to their local and/or regional economy, in part through job creation and generation of tax revenue. Periodically they commission, or produce “in house,” economic-impact reports to bolster these claims. The purpose of many of these studies is to articulate the value of an institution of higher education, including spillover effects, often to help the institution compete for state funding (or resist cutbacks), maintain its threatened tax-exempt status, obtain a subvention, fend off criticism, or as a core plank in some new fund-raising initiative.

Concomitant with these efforts, however, are frequent methodological and measurement pitfalls and potholes. The purposes of this chapter are: (1) to describe common approaches, errors, and extensions in many of these impact studies, and (2) to suggest better ways to think about the economic impact of institutions of higher education. It is certainly not our intention to belittle the colleges that conduct or commission studies of their economic impact, but we believe that the fundamental mission of these institutions compels them to apply equally high standards of scholarship, accuracy, and transparency in assessing their own activities that they would demand of faculty and others engaged in scholarly research.

Section Two provides an overview of popular economic impact studies and the claims in many of them when the subject is higher education. Sections Three through Nine dissect the various components common among these studies—the implicit counterfactual or “but for” alternative, definition of the local area, measuring expenditures and avoiding double-counting, the use of appropriate multipliers or indirect effects, local taxes, spillover effects, and ancillary activities. In Section Ten we offer our conclusions and recommendations for anyone embarking on, or involved in the creation of, an economic impact study of an institution of higher education.

2. Economic Impact Studies

Higher education is just one industry among many that generate estimates of local economic impact. Newspapers are replete with estimates of purported economic benefits due to the opening of a casino, production of a movie, or a national political convention. Some accounts describe negative impacts – damage caused by 100-year floods, or business lost due to new regulation. Claims of enormous economic gain are ubiquitous in the sports world as well. The National Football League estimates the Super Bowl’s value to its host city at over \$500 million. Promoters claim that a new minor-league baseball park is worth seven-figures in dollars and five-figures in jobs. In some cases these claims are harmless self-promotion, but in many instances exaggerated impact studies are used to secure public funding that competes with other social agendas, or cause policy makers or private institutions to misallocate resources, and thus cause spending inefficiencies.

Colleges and universities have been commissioning economic impact studies for decades. Many still follow the template codified in Caffrey and Isaacs (1971), although innovations have added to the complexity and breadth of these studies over time. The basic procedure is to sum expenditures of the college community (students, faculty, staff and visitors) created by the presence of the institution and apply multipliersⁱ to reflect the churning of direct expenditures through a local economy (e.g., part of a dollar paid to a local printing press is subsequently paid to a local repair service). The result is an estimated “local economic impact.” This common dollar figure often appears in the headline of the report, is invariably in the millions (often reaching billions) of dollars, and is frequently complemented by an estimate of job creation. For example:

- “The study found that the University [of Florida’s] total economic impact on the state for the 2009-2010 fiscal year was \$8.76 billion, and total employment impact was more than 100,000 jobs.”ⁱⁱ
- “Combining the impact of spending by the University, its students and visitors, and taking into account the multiplier effect of this combined spending, we estimate that in fiscal year 2008, Tulane accounted for: approximately \$694.6 million in economic activity and more than 8,300 FTE jobs in New Orleans.”ⁱⁱⁱ

Inputs into a college impact analysis include: direct employment and payroll, minus federal taxes; expenditures for equipment, supplies and services; construction costs; public and private support of research grants and contracts; spending in the local community by students from outside the local area and by local students who alternatively would have attended college elsewhere; and expenditures by visitors, including alumni, who visit the campus for academic and/or athletic events. Universities with medical centers sometimes include corresponding expenditures at their hospitals. Multipliers are applied to these sums to account for indirect and induced impacts.

Some studies take credit for in-migration of students (from out of state who come for college and remain) as well as incremental lifetime incomes and sales taxes paid to the state. Impacts in the form of innovation and technology transfer are highlighted with lists of local companies that spun off from university research or student initiatives. Colleges claim to enhance the quality of the local work force and promote public service (e.g., “On average, Liberty University students provide approximately 4.3 hours of volunteer service per month or a total of 586,262 hours per year.”^{iv}). Colleges also tout their contributions to local culture and the overall quality of life – theater, music performances, museums, and art exhibitions, most of which are open to the public – but they are difficult to quantify (“Texas Tech offers a number of cultural and educational programs, as well as facilities, to the public and thus provides intangible benefits that improve the quality of life of those in the local community.”^v). Some studies argue

that colleges are valuable because they are “stable” components of the economy, less prone to contraction in recessions than other businesses.

There is no comprehensive list of college economic impact studies. In a review completed prior to 1992, Leslie and Slaughter (1992) surveyed about 60 reports. For this chapter, we reviewed the results of another 186 studies done since 1992, covering 617 individual institutions (updating our review in Siegfried, et al. 2007). Some institutions enter the statistics multiple times because they commissioned multiple studies over time or because they were involved in both individual and group impact studies (e.g., “Higher Education in Middle Tennessee”). Because of their reliance on government support, 86 percent of these impact studies are for state-affiliated institutions.

In addition to Caffrey and Isaacs, and Leslie and Slaughter, other contributions to the college/university economic impact literature include: Beck, Elliott, Meisel and Wagner (1995), who proposed new methodologies, attempted to account for short- and long-run flows, and gave alternative ways of thinking about geographic regions; Brown and Heaney (1997), who discussed the traditional "economic-base" approach; Felsenstein (1996), who used Northwestern as an example of a university's impact on a metropolitan area; and Blackwell, Cobb and Weinberg (2002), who discussed traditional and human capital impacts, and conducted a case study of Xavier University in Cincinnati.

The complexity of impact studies and their emphasis on persuasion leads to more dispersion in measurements than the diversity among colleges would imply, raising doubt about their accuracy. A recent study for the University of Wisconsin-Madison claimed a \$12.4 billion impact on Wisconsin in 2010.^{vi} But a 2002 study by the same contractor claimed that the entire University of Wisconsin System (the Madison campus plus 12 other four-year universities and

13 two-year colleges) had a smaller impact, equal to \$11.5 billion when converted to 2010 dollars.^{vii} Most of the difference arises because the Madison-only study claimed credit for the UW hospital: a change in methodology adding to dispersion but absent from the sound-byte version of a total impact.

Consider some standardized measures of impacts that should vary modestly among colleges. Leslie and Slaughter (1992) standardized economic impacts by dividing “business volume” by the college budget. We interpret business volume as the headline economic impact in dollars and budget as total expenditures. Among 77 of the post-1992 studies we reviewed, the estimated impact divided by budget ranges from 0.61 to 6.18, with a mean of 2.33 and standard deviation of 1.21. In 130 reviewed studies,^{viii} the estimated employment impact divided by budget (in \$ million) ranges from 9 to 271, with mean 38.2 and standard deviation of 36.9. The implied multipliers for job impacts^{ix} in 136 studies range from 1.03 to 10.47. Although colleges and their communities are heterogeneous, the variety is not enough to justify such a large range of estimates.

In the analysis that follows we address common methodological challenges that affect the accuracy and reliability of these estimates.

3. The Counterfactual

The key consideration for studies assessing the local impact of a college is the extent to which area residents are better off with the institution there than they would be in its absence. “Better off” is usually defined as higher employment, per capita income or, perhaps more controversial, local tax revenue, but it surely should also include the many aspects of life that are not measured in dollars and cents, such as health conditions, social status, personal relationships,

security, cultural opportunities, and other living conditions that are difficult to quantify. The proper procedure is to compare economic indicators in the presence of the institution with predictions of those same indicators “but for” the college – that is, compare actual to “counterfactual” outcomes. From this perspective *that portion of an institution’s economic activity that would remain in the local area even if the institution were not there is not a contribution to the local economy.* Or, as an impact study of the College of St. Benedict and St. John’s University in Minnesota put it graphically:

“Essentially, one must imagine that some type of giant laser gun suddenly eliminates both the College and University, and all students, faculty and staff are immediately ‘beamed’ elsewhere to ‘rematerialize’ and continue with their work. By measuring the change in economic activity if this happened, we come to the impact that these campuses have on the community.”^x

Few studies of the local economic impact of colleges and universities explicitly articulate such a counterfactual.

The absence of a clear vision of a realistic alternative elevates the risk of using inconsistent counterfactuals that exaggerate the impact of a single institution. Moreover, a divergence between the area of study and the area appropriate to the multiplier can lead to internally inconsistent estimates.

The extent of relevant activity depends on the scope of the pertinent area, the capacity of alternative local suppliers of services to substitute for those produced by the institution, and the extent to which consumers would accept alternative suppliers. For example, a university that attracts students who otherwise would enroll at other institutions in the same metropolitan area does not draw many new students or dollars to the area if the other local colleges can increase their enrollment. In contrast, an isolated rural college is likely the sole local attraction to its students, and thus reasonably might be credited with virtually all of the impact stimulated by its

students' expenditures. The extent to which colleges and universities attract outside money to an area, i.e. sell "exports" or induce "import substitution" (revenues from students who live inside the local area who, but for the college, would have attended a college elsewhere), depends on both the origin of their students, and what the students would have done if the college had not been there.

Establishing a counterfactual for a college is challenging. First, institutions of higher education do not appear and disappear quickly. Conceptualizing Williamsburg, Virginia, without The College of William and Mary (founded 1693) is difficult. The annual number of colleges opening or closing is modest.^{xi} Because most colleges start small and grow slowly over time, it is also usually impossible to identify a short period of time over which the difference between the absence and presence of a college on its local area might be discerned. The abrupt closing in 2008 and reopening in 2011 of Antioch College in Yellow Springs, Ohio, is an unusual counter-example that could provide an opportunity to assess the local economic impact of a small college with a natural experiment.

Second, no one cares about the effect of any economic stimulus on a geographic area void of residents. Interest in impact is a concern about people and their standard of living, in which case the precise relevant population must be identified. This is where many studies of the economic impact of colleges and universities collapse methodologically.

Who, precisely, is of concern? Were a college to leave an area, who would stay, and who would leave? If a new campus were opened that might stimulate economic activity, for example, the University of California-Merced, whose welfare should be measured – the 67,000 Merced residents living in the northern part of the San Joachin Valley before anyone thought of locating a university there, the 100,000 permanent residents who might live there in 2020 when the new

university operates at planned scale, or the 130,000 residents, including students, who might live there in academic year 2021? If welfare were measured by the difference between one's income and what one could earn in his or her next best alternative, a general increase in local wages and salaries stimulated by locating the newest University of California campus in Merced would benefit the original residents. But those who move to Merced because of the university may or may not find better opportunities there. Similarly, increases in local property values stimulated by the new Merced campus would accrue to those who owned property there when knowledge of the development was released. But these gains would be offset elsewhere in the state to the extent that this new campus attracts students who would alternatively enroll at other California institutions.

As another recent example, similar to the expansion of California's university system, Florida opened its tenth public four-year university in 1997 in Fort Myers, on the southwest Gulf Coast. Florida Gulf Coast University held its first graduation in 1998, awarding 81 degrees to transfer students. A dozen years later, in 2009-10, Florida Gulf Coast enrolled slightly over 7,000 students and awarded 1,460 bachelor's degrees, a remarkable rate of growth. The main local economic impact of Florida Gulf Coast must be to reduce the number of residents in the Fort Myers and Naples area from migrating to other regions of the state to attend one of the nine public Florida universities established earlier.

Studies conducted to enhance the political standing of a college naturally promote benefits accruing to local residents who likely would reside in the area even if the college were absent. The institution's in-migrant administrators and faculty already know they are beneficiaries. They either understand that and are loyal allies of the institution already, or expect they would have enjoyed analogous benefits elsewhere. But hardly any economic impact studies

separate the effect of the institution on residents attracted to the area by the institution from the effect on those who would have resided there anyway. The effect on those who migrated to take jobs at the institution is only the extent to which those jobs are better than the ones their occupants left behind.

Migration incentives created by a college complicate the identification of local economic impact even further. Imagine a university that “creates” 1,500 new jobs, attracting 1,800 new workers to the local area, 300 arriving as members of families of faculty and other specialists migrating to work for the institution. The university touts the addition of 1,500 jobs added to the area, while the residents who would live there anyway face 300 new competitors for other local jobs. While the impact study trumpets additional jobs, those who would have lived there anyway may be worse off, some perhaps newly unemployed, and others employed at wages diluted by an increased labor supply.^{xiii}

On the other hand, it is possible that a college or university attracts ancillary businesses that require a skilled workforce, affording improved employment opportunities to the local residents who would have lived in the area absent the college. Such a favorable outcome, of course, presumes that the local labor force is able to land the skilled jobs at the ancillary businesses, probably an impractical assumption if we contemplate many chemists, computer scientists or engineers working for such businesses.

Third, because the impact of *all* the economic activity generated by the institution is compared implicitly to doing nothing, the implied counterfactual in most impact studies is the complete absence of the institution. But few decisions are of such an “all or nothing” nature, particularly in academe, where change occurs slowly. When considering the effect of an expansion or contraction of a college, it is the effect of *incremental* investment that is relevant.

The impact implied by “all or nothing” analysis is an average measure, confounding the irrelevant impact of, say, the first 10,000 students with the effect of the last 100 students to enroll. Diminishing marginal returns can create mischief when an average impact of the entire investment in a college or university is inappropriately interpreted as the relevant effect of an incremental expansion.

Fourth, when a college or university hires faculty and administrators who migrate to the area, the size of the community changes. Most individuals have preferences regarding the population size and density of their environment. Larger communities may create positive externalities such as greater entertainment, recreation, cultural, medical, shopping and dining opportunities. Unfortunately, they also usually create more congestion, conflict and pollution.^{xiii} If a college changes the size of its host community (e.g. Iowa City, Iowa), the debate over the local economic impact of the institution should also consider optimal city size (Getz and Huang, 1978).

Even more important than the challenge of articulating a precise and consistent counterfactual implicit for the college or university is the more general issue of the opportunity cost of public or private investment in higher education. A \$100 million infusion of tax revenue to the budget of a state university catering to in-state students might have been directed by the legislature instead to K-12 education, crime prevention, road repairs or even tax relief. There is no reason to expect that the re-circulation of dollars spent on teachers, police or paving contractors has a different, or smaller, indirect effect on the local economy than dollars initially spent on college inputs.

A dollar spent by a college or university may eventually create multiple dollars of local economic activity. But a dollar spent golfing or for a seafood buffet does the same. One

difference between colleges and other establishments is the extent to which initial expenditures of colleges and universities attract new money into an area.

Not all colleges and universities are alike in this regard – some attract much new money to an area, while others attract little. Vanderbilt in Tennessee and the University of Wyoming enroll an entire student body destined to attend an out-of-state college if those two institutions did not exist.^{xiv} Other colleges, e.g., Colby in Maine or the University of Texas, enroll many students who would attend a different institution in the same state (e.g., Bowdoin or Texas A & M, respectively) if their first choice were not available. Each college or university must be examined closely to determine the extent to which the revenue it collects would remain in the defined local area if the institution did not exist.

Perhaps partially in response to this critique, some colleges in the same area form groups and measure their economic impact collectively. This circumvents the substitutes issue, since there might be no existing substitute for the entire group of existing colleges. The sixteen colleges and universities in Baltimore are an example. Although Towson University might not be able to claim credit for drawing to Baltimore students who otherwise would have attended the University of Baltimore or another college in the city were there no Towson, the group of sixteen has a legitimate claim that they collectively draw out-of-town students to Baltimore.

The absence of a substantial local economic effect of an individual college or university because reasonable substitutes are available does not imply low value for higher education in general. The overall effect of higher education on the economy is quite substantial. For persons age 25 and over, in 2010 the unemployment rate averaged 5.4 percent for bachelor's degree holders (with no post-graduate degree), in contrast to 9.2 percent for individuals with some college, but no degree, and 10.3 percent for those holding only a high school diploma. For full-

time workers in 2010, median annualized earnings averaged \$54,000 for bachelor's degree holders, \$37,000 for those with some college but no degree, and \$32,500 for individuals who ended their formal education with a high school diploma (Bureau of Labor Statistics, July 2011). A careful study (Heckman, Lochner and Todd, 2008) calculates the average private rate of return to an investment in four-year college tuition and fees (but not room and board, because those costs would have been incurred even without investing in higher education) to be over 15 percent. This is far greater than the average expected return on the investment in incremental physical capital or most financial instruments.

4. Defining the “Local Area”

To estimate the impact of a college or university on all or some (e.g., those who would have lived there absent the institution) of the residents of a “local area,” one must carefully delineate geographic boundaries. Two principles govern the choice of boundaries. First, the area should fit the purpose of the economic impact study. Second, however delineated, the boundaries must remain consistent throughout the analysis.

The appropriate geographic boundary for analyzing local economic impact depends on the question(s) at hand. If a state university wishes to justify a subvention from its legislature, the geographic boundaries should be congruent with the interests of the legislature – e.g., the state's borders. A private college using a study to justify exemption from local property taxes would presumably delineate the area on the basis of the local tax jurisdiction. A research university seeking more media attention might focus on the television reception or newspaper distribution area surrounding it.

Geographic boundaries have two important effects on the analysis. First, only export sales from, or import substitution into, the defined area constitute “new spending” that would have a significant first-round economic impact. Sales that substitute for other purchases by local residents may increase the apparent economic impact of a college or university, but they will generate an offsetting negative effect elsewhere in the area. For example, if a student from New York City enrolls at Columbia instead of her second choice, New York University, and NYU does not replace her with another student, Columbia generates no net economic expenditure in New York City.

In contrast, almost all student expenditures in Boulder by University of Colorado students are either exports or import substitution from the perspective of Boulder because there are no other traditional colleges there. If the area of interest is expanded to the state of Colorado, many UC-Boulder students alternatively would have remained in-state and attended Colorado State University, University of Northern Colorado, or Colorado College. As the relevant area expands, the amount of expenditure that is “new” to it declines. The smaller the area considered, the larger the proportion of total expenditure that is properly treated as exports or import substitution.

Second, the appropriate multiplier grows as the area under consideration expands. In a narrowly defined perimeter, e.g., just Boulder, much of the first-round of expenditures by the university to purchase goods and services leaves the area immediately.^{xv} Not only are many of UC-Boulder’s vendors located in Denver and Fort Collins, but also many of its employees live and spend much of their disposable income outside Boulder. When UC-Boulder’s expenditures re-circulate beyond Boulder, they do not expand Boulder’s economy. Viewed from the entire state of Colorado, however, many first-round expenditures on vendors and employees who live

in Colorado but outside Boulder remain “local.” The multiplier is largest in a completely closed economy, devoid of leakages.

It is tempting to define the area narrowly so as to maximize the export and import substitution nature of enrollments and spending, and simultaneously use a multiplier that has been derived by following economic activity through a larger, inconsistently defined, self-contained area. Because many college impact studies use “off-the-shelf” multipliers not tailored to the particular area under consideration, they are susceptible to such an analytical sleight of hand. In reality, there is always a tradeoff between the extent of export sales and the magnitude of the multiplier.^{xvi} When using off-the-shelf multipliers, the analysis must necessarily use the same “local area” as was used to compute the multiplier.

5. Measuring Expenditures, Double Counting, and *Cui Bono*

Some economic impact studies conducted by colleges and universities apply a regional multiplier to *all* expenditures by the institution. Such an approach is *never* valid. It is inconceivable that every dollar of any college’s revenues (and corresponding expenditures) is derived from export (or import substitution) sales. Surely some revenue, if only from a resident who purchases lunch at the campus grill rather than a local Olive Garden, does not represent new money attracted from outside the area.

In order to identify the amount of *net* new spending a college or university contributes to a local area, it is necessary to measure funds *that are new to the area* as they pass a particular portal, and *to apply the appropriate multiplier only to the portion of those new-to-the-area funds that are spent in the local area*. Funds that are new to the area include spending on tuition, room and board, and incidentals (e.g., purchases of supplies at a local Wal-Mart, or haircuts at a

barber down the street) by students who would not otherwise (“but for” the college) live or attend college locally. This includes revenues from students from inside the area who, absent the college, would have attended a college elsewhere (import substitution).

New spending also includes grants for research projects funded by organizations that would have sent their grant money elsewhere but for the college, gifts and contributions to the college that would have gone elsewhere but for the college, and any other local revenue flows originating outside the area that would not have materialized absent the college, e.g., money spent by visitors attracted by the institution on potential college scouting trips for high school seniors, on journeys to attend college sporting events, or visiting friends or family attending the institution, money spent by retirees who moved there because of the college, or medical bills paid by patients consuming specialized teaching hospital services that are not available from alternative local medical centers.^{xvii}

The fundamental underlying principle is to count funds new to the area only once. It is improper to add together *all* spending by students *plus* expenditures by the college or university, because (a) some of the spending by students might have occurred in the area but for the college if some students are local residents who, absent the college, would not have continued their education beyond high school or would have attended another local college, and (b) the majority of student spending is made *to the college or university*, which, in turn, spends those same funds to meet its payroll and pay vendors for goods and services consumed by the college. So, counting tuition revenue and spending by the college is double-counting.^{xviii}

After new-to-the-area revenue is isolated, multipliers should be applied to it that reflect the extent to which each portion of the revenue is spent and re-spent within the local boundary. Some college expenditures immediately leave the area, for example, purchases of goods or

services that are not produced there, and salaries paid to employees who live and spend most of their income somewhere else. Also leaving the area immediately are most federal income and payroll taxes. It is more appropriate to use disposable income plus local (sales, income and property) taxes to measure first-round expenditures that affect the local area. The multiplier for expenditures that immediately leave the area is one, or at least very low, since most of those funds are not re-spent locally. Other expenditures remain in the area for many rounds of re-spending, for example, payments by the college to a plumber who repairs a leaky water line and, who, in turn, spends the money at a neighborhood restaurant that, in its turn, pays its workers and local produce suppliers, and so on.

If the appropriate criterion for evaluating economic impact is the welfare effect on residents living in the area were the college or university not there, then, quite importantly, *none* of the college expenditures made to in-migrants (faculty and specialized staff, such as librarians and computer specialists) should be counted in the first round of expenditures, because those in-migrants are not part of the “but for” population. *However, the second and subsequent rounds of expenditures passing through these employees and on to individuals who would have lived in the area absent the college should be counted.*

Colleges and universities have another characteristic that induces double-counting: they sell products and services to their own employees, or hire their “customers” as student-workers. Colleges typically sell lunches, books, logo merchandise apparel, supplies, and athletic tickets to their employees. Universities with hospitals often self-insure employee medical benefits and create incentives for employees to consume medical services at university facilities. In such cases, compensation paid to employees overstates expenditures that move on to a second round locally because a portion of the compensation is spent “internally” within the university, thus

constituting revenue for the institution that does not originate from outside the local area. Including such internal transactions may lead to non-trivial double-counting. Similarly, charitable donations from faculty and staff to the institution that employs them should be excluded from first-round expenditures because such donations are transferred back to the employer as revenues.

Construction and other investment spending require special treatment in impact studies. If construction on a state university campus is financed via a capital expenditure budget, and the opportunity cost of building, say, a new student residence hall is the resurfacing of roads in the same geographic area, the construction expenditure is not net new spending. If, on the other hand, investment in educational facilities is financed from outside the area (say, by federal support), reflecting no local opportunity cost, the expenditures should be included because they represent new economic activity for the local area.

Another counting issue arises from the distinction between head counts and what is generally referred to as an "FTE" (full-time equivalent) when it comes to number of students served, jobs created, or another aspect of some activity. For example, estimates of the impact of a Super Bowl game on the local economy invariably count the number of jobs created while ignoring the fact that most of them are temporary and for only a fraction of something akin to full-time employment. If one is hired for, say, 20 hours a week for the four weeks leading up to the game, that's a total of 80 hours a year (or for ten years if the Super Bowl won't return to town again for a decade), or only 1/25 of a full-time job, defined as working 2,000 hours a year (40 hours a week for 50 weeks).

Like the National Football League, some colleges claim their presence is responsible for thousands of jobs without specifying clearly that many of them are temporary and/or part-time

jobs. This ambiguity can confound comparisons of the economic impact of a college or university across academic settings. Institutions could state that they have an annual enrollment of 20,000, but if each of those students takes one course per semester at one college, but in another college students take a full-time, academic-year load of eight courses, then the former only has 5,000 students on an FTE basis. The same is true on the faculty side of things as well. One institution may employ a large number of adjunct instructors who, over the course of a year, may teach only a fraction of what a full-time faculty member would teach. Many hourly employees, such as cafeteria workers, do not work at all--or get paid--in the summer months. When comparing an institution's impact in terms of jobs created, it is important to express results in terms of conventional full-time-equivalent units.

6. Multipliers

Two approaches are used to convert an injection of first-round expenditures into the total impact of an institution. Both rely on the idea that local expenditures new to an area create income for other firms and individuals, and they, in turn, spend some of their added income locally, thereby “multiplying” the initial infusion. Most economic impact studies commissioned or conducted by colleges and universities (68 percent of the studies we reviewed) make use of a standard “off-the-shelf” regional analysis software model to estimate their local and/or regional economic impact. IMPLAN (IMpact analysis for PLANing) and RIMS (Regional Input-Output Multiplier System) are two of the more popular packages used.

Feeding in data on goods and services flows, as well as employment and compensation levels, these “I/O” models can capture both the direct (or “first-round”) and secondary (or indirect or “induced”) impacts of tourism, a transportation system, the fishing industry, or a big-

ticket sporting event such as the Super Bowl. And, of course, the economic impact of an institution of higher education. The I/O models predict local economic activity in two situations: 1) the institution is present and operating, and 2) the institution is absent, so its expenditures did not occur (the “but for” situation). The difference between the predictions is the impact of the institution on the local area.

Some impact studies apply a simpler method that does not require I/O models like IMPLAN. Authors of such studies typically apply a single numeric multiplier to all new expenditures attracted to the area by the institution,^{xix} in order to capture the subsequent rounds in spending. Thus an initial expenditure eventually boosts spending more than the initial outlay.^{xx}

Regional impact models allow researchers to change parameters to suit the circumstances, while simple numeric multipliers are less costly to use. Regional models used to estimate the local impact of new expenditures in an area are calibrated on the basis of the average interactions among all economic agents in the area. They assume that new expenditures are distributed as the average of historical expenditures.

There are several reasons to suspect that the coefficients relating inputs to outputs in a regional economic model may be inappropriate for estimating the local impact of a college or university. First, if the pattern of *incremental* local expenditures differs from the pattern of average local expenditures (perhaps because incremental expenditures contain less infrastructure content than average expenditures) the use of average inter-industry interactions imbedded in a regional economic model will distort the estimate. Second, the outputs of a college or university – individuals with innovative and technical skills, and new technology itself – are intended explicitly to alter a regional economic model’s coefficients, thus eventually rendering obsolete

the model's estimated relationships between inputs and outputs in the local economy. Third, the coefficients in the model often assume that preferences of residents for purchasing goods and services in a "college town" match those of residents in other areas, which may not be true.

Regional multipliers usually have a magnitude around two (Elliott, Levin, and Meisel, 1988, p. 26). The size of the multiplier varies with the scope of the local area. Among impact studies we reviewed are 34 separately reported expenditure multipliers, ranging from 1.34 to 3.25, with a median of 1.7. The upper end of this range is almost certainly too high, since colleges study their impacts on cities and states that leak plenty of spending (say, in the form of federal taxes or Internet purchases).

Some state-supported colleges and universities engage in a sleight of words that exaggerates the multiplier even further. The crafty statement from a 2010 study that "For every \$1 invested in the University of Iowa by the state, \$15.81 is generated in the state's economy"^{xxi} may be accurate, but it is misleading. It implies that every dollar spent on the university causes a return of \$15.81 to the state annually, for an annual rate of return on state investment near 1500 percent. When stock returns of just 10 percent bring joy to investors, a 1500 percent annual rate of return sounds too good to be true. And, of course, it is, because it attributes all of the return from the university's myriad activities to the small portion of its budget contributed by the state, and no return to tuition, fees, private donations, or grants and contracts received by the university's faculty. These measures are particularly sensitive to the proportion of an institution's budget that is paid by government, but have little to do with local economic impact.

In 76 studies that reported a relationship between state appropriations and economic impact, the multiplier ranges from 1.84 to 26 with a median of 5. Some studies drop the sleight of words and claim explicitly that readers should interpret the state-appropriations-to-impact

relationship as causal. For example, “Maine taxpayers realize a more than 800 percent return on their investment of \$184.7 million through state appropriation.”^{xxii} Such a claim is all too common and also incorrect. This kind of logic has even been applied to state tax revenues, with the implication that the college is a money machine: “For every \$1 in state funding allocated to the UW [University of Washington], \$1.48 in tax revenue is returned to the state.”^{xxiii} This makes it sound like the University of Washington is better than a perpetual-motion machine. An institution of higher learning should never make such an obviously misleading statement.

7. Local and Not-So-Local Taxes

“As recession-racked cities struggle to balance their budgets . . . a growing number are seeking more money – just don’t use the word taxes – from nonprofit institutions that occupy valuable land but by law do not pay property taxes.”^{xxiv}

Tax considerations regarding colleges and universities may also affect state finances and their surrounding areas in a number of ways. On the one hand, most not-for-profit institutions are exempt from local property taxes and sales taxes. (More than half of the land in the Greater Boston area is tax exempt.) To the extent that it consumes local public services and replaces otherwise taxpaying property, a college or university creates an added burden on other taxpayers in its area. For example, Pittsburgh has challenged the tax-exempt status of an apartment building Duquesne University purchased in order to use as a dormitory, therefore taking it off local property tax rolls. The conversion would cost the city about \$350,000 in lost property taxes annually.^{xxv} In November 2004, when Northwestern University purchased an office building, it made payments totaling \$2.1 million over three years to the city of Evanston and school districts, payments it estimated were approximately equal to the amount of real estate taxes that these

public units would have received in those years had the university not purchased and converted the property.^{xxvi}

Many colleges and universities make “payments in-lieu-of-taxes” (or “Pilots” in common parlance) and provide some private services such as police protection and trash disposal. (Princeton University contributes \$1.7 million to its two local political jurisdictions.^{xxvii}) In 1989, eleven percent of university communities received payments in lieu of taxes from universities; 38 percent of cities with fewer than 25,000 residents received payments in lieu of taxes (Gumprecht 2005, page 44). To the extent that “in-lieu-of” payments exceed the remaining burden of local public services not provided by the institution (e.g., the University of Chicago police patrol an area larger than just the campus; Davidson College operates a volunteer fire department that also serves the town; and Northwestern University maintains its campus water and sewer lines), tax considerations might, on average, even produce a net financial gain to the surrounding jurisdiction and its residents.

Although the property of non-profits is normally exempt from local taxes, for a variety of reasons the value of private property surrounding most colleges and universities may well be enhanced relative to its likely value in their absence. (In economic jargon, the institution creates a positive externality.) The additional property taxes collected from this enhanced value helps to offset taxes foregone on exempt property. Rising property values are not welcomed by all native residents, however, particularly those who do not own homes.

The net impact of local taxes both paid and avoided, services provided in lieu of taxes, and changes in property values in the local area are complex and often make for contentious town-gown relationships. They are seldom considered in impact studies. One report that did not

duck this issue was Northwestern's 2006 study that concluded with a "net fiscal impact" paragraph:

In fiscal year 2004 the City of Evanston revenues generated by Northwestern University's presence exceeded total costs attributable to the University by \$2.9 to \$4.4 million. Direct costs to the city were more than offset by taxes and fees paid directly by the University. Northwestern also provided key economic support to Evanston businesses and real estate markets, undergirding the local economy and Evanston's tax base. Though exempt from real estate property and sales taxes, the University generates substantial tax and fee revenues through the expenditures of its students, faculty, staff, and visitors.^{xxviii}

In addition to the local revenue dimensions above, by virtue of their admission decisions and policies, public universities also affect the flow of revenues within and across state boundaries. If one takes at face value the assertion that tuition does not come close to covering the cost of providing the typical undergraduate with a college education, then there are clearly both within-state and out-of-state subventions to be considered.

Within a given state, higher education activities are not distributed equally. It may be that within a large metropolitan area a number of community colleges and four-year institutions serve largely a local (and thus commuting) community. But when BSU ("Big State University") is located in the stereotypical "college town," then some revenues from state sales, income and property taxes are shipped from taxpayers around the state to that campus (or those campuses). In addition to the simple mathematical calculations of those flows, there may also be equity issues at play – the average income (and taxes) of the state resident v. the average income of those receiving the transfers.

In addition, for the United States as a whole, 20 percent of college freshmen are enrolled outside of their state of residence, with our nation's capital drawing 93.3 percent of its students from outside the District; North Dakota had 44.7 percent of its students from out of state, while

Texas, with only 7.7 percent, was at the other end of this spectrum.^{xxix} Although out-of-state tuition is generally much higher than in-state tuition, even out-of-state tuition does not often cover the cost of educating the typical non-resident. Thus, what may be a *positive* net fiscal impact on the local community comes at the cost of a potentially *negative* net fiscal impact to the state that is funding the college.

We now turn in Section 8 to complementary aspects of these policies – from financial to population to human capital.

8. Local Spillover Benefits from Enhanced Human Capital

Although colleges produce consumption services, such as entertainment, status and culture, their basic purpose is to enhance human capital – to create and foster graduates’ skills, talents, curiosity, imagination and creativity. Everything else the same (e.g., new expenditures attracted to the area), one would expect a college that produces human capital to have a larger impact than a sports venue or a manufacturing facility. The remaining question is the extent to which that effect is local.

Economists have long recognized that returns to investments in higher education differ when viewed from the perspective of society than from the narrower self-interest of an individual. One difference is in cost burdens: society typically subsidizes a portion of the investment individuals make in higher education, so investment costs to an individual fall short of total opportunity costs of a college education. A second difference is that dividends from human capital investment may accrue to society and the individual in different ways. For an individual, the primary benefit is a higher future earnings stream. For society, it might be

aggregate earnings, but better health, social cohesion and aggregate growth through technology and ideas might be important effects as well.^{xxx}

Bluestone (1993) argued that incremental future incomes of college graduates who stay in the area should be counted in local impact.^{xxxi} *Little of this income, however, would go to people who would have populated the area “but for” the college.* Consequently, earnings of migrant students who join the local labor force after graduation should be excluded. Moreover, only *incremental* earnings of local college graduates should be counted. They would have earned something had they remained in the area with only a high school diploma.

In addition to direct human capital effects, a college may generate indirect human capital impacts by increasing the overall local education level. This may have beneficial indirect effects on those who would have lived in the area without the college present. Possible social benefits of education include the enhancement of productivity and earnings that spill over to local residents who themselves did not attend college, reduced crime, improved public health (and lower medical costs), and greater civic responsibility.

Spillover benefits occur if more highly educated workers enhance the productivity of other workers. Evidence based on cross-section regressions of individual earnings on individual characteristics (including educational attainment) and the average level of education in a local area suggests that this phenomenon is real, at least on a national basis (Rizzo, 2004). Rauch (1993) found that large social benefits of education are capitalized into wages and housing prices. More recent studies attempt to account for the fact that local education levels do not evolve randomly. Moretti (2004) found that a percentage point increase of college graduates in a community’s workforce increases wages of local high school dropouts by 1.9 percent, high school graduates by 1.6 percent, and other college graduates by 0.4 percent, for a weighted

average effect of 1.3 percent. In contrast, Acemoglu and Angrist (2000) found little evidence of local productivity spillovers from increased education. Iranzo and Peri (2009) argue that college education has much larger positive spillovers than lower levels of education, and this can rationalize different findings in the previous literature. Lange and Topel (2006) concluded in their review of the literature that there may be productivity externalities from the accumulation of local human capital, but they are difficult to quantify.

It is also difficult to quantify the effects of education on crime, health, and civic responsibility, but there is growing evidence that these effects are meaningful. Lochner and Moretti (2004), controlling for feedback effects of crime on education, estimated that differences in educational attainment between black and white men explain 23 percent of the black-white difference in incarceration rates. Breierova and Duflo (2002), and Currie and Moretti (2003) found that higher maternal education improves infant health (although McCrary and Royer (2011) found that increasing mothers' education at low levels does not significantly improve infant health). Milligan, Moretti, and Oreopoulos (2004) found a strong positive effect of education on voting in the U.S., and that more educated adults have better information about election issues.

Spillover benefits that manifest themselves in higher earnings of individuals other than the graduates themselves can be added to direct local economic effects. Groen (2004) estimated that, on average, for students originally from elsewhere, ten percent are likely to reside in the state where they attended college 10-15 years after graduation. Using an estimate of the number of college educated workers attracted to an area annually by the presence of a college, it would be possible to calculate the cumulative annual percentage increase in the education level of the local workforce caused by the college, if there were no offsetting effects. Offsets, however, are

likely. Unless Emory, Spelman and Georgia Tech graduates who take jobs in Atlanta fill *new* positions created only because of the presence of those particular Atlanta colleges, graduates of, for example, South Carolina, Duke, Auburn or Florida State would move to Atlanta to occupy the positions otherwise taken by the Emory, Spelman and Georgia Tech graduates (Brown and Heaney, 1997; Krieg, 1991, p. 72). If employers locate in Atlanta *only because* of the supply of college graduates there, the employers must believe it is difficult to persuade graduates of Atlanta universities to move elsewhere. However, if college graduates are mobile, the net effect of a college on the proportion of the workforce holding a college degree is close to zero, although there will be more Emory, Spelman and Georgia Tech alumni in Atlanta than would otherwise reside there. The argument that a college or university enhances the education level of the local workforce is cogent only if its presence attracts new *employers* to the local area.^{xxxii} Bound, Groen, Kezdi, and Turner (2004) found that the link between a state's production of higher education and its stock of human capital is weak.

It is difficult to determine what metric to multiply by Moretti's estimated effect on wages (1.3 percent per one-percent increment in the proportion of the workforce with a college degree). The proportion of an institution's graduates who remain in the area surely varies by location – it could not be 10 percent at Cornell because there are not enough jobs in Ithaca, New York, to absorb ten percent of Cornell's graduates – and the net effect is likely to be much less than 10 percent, on average, because the local college graduates who stay in the area crowd out graduates from other institutions who otherwise would have migrated in. Although spillover effects of education on the productivity and earnings of non-college graduates may be substantial, as Moretti estimated, the effect on local areas is likely modest because college educated workers would be attracted to the area regardless of their alma mater. Similarly, while spillover benefits

of education on crime, health, and civic responsibility may be real and substantial, it is also not likely that they depend critically on the presence of a local college or university.

In addition, there are other important areas and examples where the presence of universities, particularly research universities, undoubtedly plays a role in the local existence of major industries that draw highly-educated workers. The Route 128 corridor in Boston (as well as University Park at MIT, a joint Cambridge-MIT venture) and the Stanford Research Park, which spawned much of the Silicon Valley entrepreneurial activities, are two well-known instances. In the “heartland,” Madison, Wisconsin start-ups and the Evanston Research Park in Illinois are two other examples.

"From its founding in 1986, the Research Park attracted and supported many businesses. . . . Most of these businesses were attracted to Evanston by the intellectual capital of Northwestern University, the educated labor force, access to the University's high-speed telecommunications network, and access to Northwestern's faculty and researchers."^{xxxiii}

Similar research agglomerations are scattered around the country, and the presence of research faculty, graduate students, and recent graduates likely keeps them local. However, such examples are the exception rather than the rule in U.S. economic geography, and most colleges and universities do not have the necessary research output to create an agglomeration of high-tech industry where none exists, and this is especially the case with liberal arts colleges and more teaching-oriented (or arts and humanities-focused) universities. Furthermore, the Bayh-Dole Act (1980), which allows universities to better capture the intellectual property inherent in the discovery and transmission of knowledge by their faculties and researchers, internalizes some of what one might otherwise consider a spillover. The development of vaccines, public policy ideas, literature, and even commercial products make up an important part of a university's impact. Benefits from such activities quickly accrue to people outside the local area.

Universities employing research faculty should advertise positive outcomes of their research. Quantifying them is not easy, however.

9. Ancillary Activities

For many institutions of higher education, natural “core” activities that complement their missions of the discovery and dissemination of knowledge include: the provision of housing; food services; the operation of art museums and bookstores (though these are more often than not now “outsourced” to a commercial firm that specializes in this activity); maintenance of a medical center and an environment supportive of ancillary start-up research firms and business enterprises that can flourish nearby; and offering their facilities and staff for professional development conferences and summer camps that bring visitors to campus. A number of these initiatives are normally referenced in institutional impact studies.

One high-profile activity, however, conspicuous by its absence in many of these reports is intercollegiate athletics. In college towns across the country alumni make pilgrimages back to their alma maters to sit with townspeople and students on autumn weekends and winter nights. Think of Ann Arbor, Gainesville, Durham, Lexington, or Provo. It is not simply a matter of the number of bodies crammed into those stadiums and arenas, but the dollar flows (in ticket, logo apparel and broadcast revenues, and donations from wealthy benefactors and state governments) in such locales are overwhelmingly from outside the immediate area.

Division I athletic powers have certainly not been shy about extolling their virtues and positive impacts on their institutions. Even a former president [Robert Carothers] of Rhode Island University, a place not usually associated with athletic supremacy, once remarked about intercollegiate athletics at his institution: “There is no physics page in the *Providence Journal*.

There is a sports page.” President of the Ohio State University, E. Gordon Gee, was quoted in *The New York Times* as having the belief that “even if football revenue represents only one-half of one percent of the total budget [at Ohio State], it also garners 90 percent of the attention.”^{xxxiv} Yet it takes a careful eye to spot any mention of these activities in economic impact reports. Visitors for sporting events are counted tacitly along with visitors for academic conferences in most studies (although some, e.g., Texas Tech, tout the dollar impact of home football games). Economic impact studies of colleges and universities tend to emphasize a relatively sedate image of applied researchers and large construction projects, rather than the more boisterous environment of college football or basketball games, leaving those images for the athletic association to advertise.

10. Conclusion and Recommendations

This essay has described the methodological approaches and pitfalls common to studies of the economic impact of colleges and universities. In this concluding section we offer suggestions for reforms in two areas that would make for more transparent and useful college economic impact studies: presentation and substance.

With respect to presentation, impact studies of public universities should stop claiming “For every \$1 the state legislature spends, the university returns \$X dollars to the state...” At best such statements are meaningless. At worst, they may delude decision-makers into thinking (incorrectly) that the marginal return on investment in higher education is several orders of magnitude more than returns on other public investments. If the returns to higher education were as high as these statements imply, states and the private sector would be building universities frantically.

Second, colleges should stop reporting a single impact in two formats so as to mislead readers into thinking benefits are larger than reality. The financial impact and the jobs impact are alternative measures of one concept. The value of economic activity to a local area occurs when that activity employs local residents, who use their income to enhance their welfare. Moreover, expenditures by employees (e.g., on local taxes or for charity) are not additions to the financial impact, but rather are included in payroll. Yet, many studies report them separately, tempting readers to infer that they are additions to the impact generated by applying a multiplier to local spending that includes payroll.

With respect to substance, there are even more opportunities to improve these impact studies. These include:

- Every impact study should articulate the counterfactual it is employing at the outset of the report, and thereafter adhere to it relentlessly. If the study compares economic activity in the area to a prediction of what would have occurred “but for” the college, it should omit the benefits that accrue to in-migrants.
- The reported impact should relate to the issue at hand. For example, if the college or university is asking for a zoning variance to build a new residence hall, the economic effect should relate to the incremental increase in the number of students the hall is planned to accommodate rather than to the entire effect of the college. While the impact of the entire institution may be impressive, and so good for rhetoric, it is disingenuous to use it to justify a policy that accommodates an incremental change.
- The pertinent geographic area should be articulated explicitly, and both the multiplier used and the extent to which revenues reflect exports and import substitution should relate precisely to its boundaries. It is inappropriate to use a small area to identify a

large proportion of revenues as export, and then adopt an off-the-shelf multiplier that has been calibrated on the basis of a larger area that experiences few leakages.

- First-round expenditures should exclude amounts that would have been spent in the local area “but for” the college. (Expenditures at university hospitals are likely the largest of these. Another is money spent by students who otherwise would have attended another college in the same area.)
- The appropriate multiplier must be applied to each type of expenditure. Research expenditures on materials imported into the area have a multiplier of zero. Any multiplier exceeding two for an area less than an entire state is suspect.
- Expenditures should be counted only once. Students’ spending on tuition and the college payroll are one and the same thing: students pay tuition so the college can meet its payroll. The payment of tuition has no effect on the local economy until it is used to meet the payroll and buy other local goods and services.
- An institution may take credit for stimulating the local economy through its spillover effects on the general level of productivity, reduced crime, enhanced health and civic responsibility. However, before these claims are valid, the college or university needs to articulate how its presence created the jobs filled by its graduates. This might be through technology spillovers from research faculty (not students), which, of course, would make it a difficult argument for primarily teaching colleges. New jobs might also arise from lower wages that compensate for attractive amenities that are fostered by the college.

If college impact studies were conducted at the level of accuracy most institutions require of faculty research, we would see fewer preposterous claims like a 2600 percent annual rate of

return (“...for each dollar of state support, [Michigan] universities collectively generated \$26 of economic impact.”^{xxxxv}). This would improve public trust in higher education officials.

Most local “economic impact” consists of activity relocated from other places, with little effect on the national aggregate. One community’s gain is offset by another’s loss. Rearranging resources improves aggregate welfare only to the extent that a new location affords less costly production, say, through the exploitation of agglomeration economies or use of geographically immobile inputs, or tailors the location of output more closely to the geographical distribution of demand. Neither of these situations seems important in higher education.

In contrast, moving resources geographically can improve local welfare. Because a particular community is often the audience of a college impact study, it makes sense to tout local benefits even if they are largely offset by corresponding losses elsewhere. However, the academic mission of colleges compels them to refrain from engaging in rhetoric that places their interests above all other social goals. Implementing our recommendations in economic impact studies would help colleges align their public communication with the mission statements in their charters and increase the trust in, and respect for, higher education officials and their institutions.

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ⁱ See Section 6 for a more extended discussion of “multipliers.”

ⁱⁱ Wells, Robert H. “Study finds UF has \$8.76 billion economic impact on Florida” *University of Florida News*. 3/3/2011 <http://news.ufl.edu/2011/03/30/economic-impact-2011/>

ⁱⁱⁱ “From Recovery to Renewal: The Economic Impact of Tulane University” Tulane University. 2010.

^{iv} Mangum Economic Consulting “Analysis of the Economic Contribution that Liberty University makes to Region 2000 and Virginia” April 2010.

^v Ewing, Bradley T. “The Economic Impacts of Texas Tech University” July 2010.

^{vi} Ward, David J., Bruce E. Siebold, Alan J. Hart, and Dennis K. Winters “The University of Wisconsin-Madison’s \$12.4 Billion Impact on the Wisconsin Economy” NorthStar Economics, Inc. March 2011.

^{vii} Winters, Dennis K. and William A. Strang “The University of Wisconsin System’s Economic Contribution to Wisconsin” NorthStar Economics, Inc. September 2002.

^{viii} The counts of studies reflected in these statistics vary, because studies do not report all the same information. For example, some studies include an estimate of jobs created but not the “business volume” dollar impact.

^{ix} Some studies submit a multiplier applied to the college’s number of employees to estimate the employment impact of the college. Other studies assume a proportionate relationship between college expenditures and induced local jobs. In both cases, we infer an employment multiplier by dividing the estimated employment impact by the reported number of employees.

^x Edwards, Mary E. and Yotiaud Vivien Apoutou (with assistance from Reeta Ale Magar) “The Economic Impact of the College of St. Benedict & St. John’s University on the City of St. Joseph and Collegeville Township” St. Cloud State University, 10 February 2010.

^{xi} From 1980 to 1996, the annual number of four-year college openings in the U.S. ranged from 1 to 10 with a mean of 4.6. The rate declines over time. We are grateful to Enrico Moretti for sharing data on college openings.

^{xii} However, when a college or university hires a local resident, the position formerly held by the resident may open up additional opportunities for another local resident, and so on. A number of local residents may secure better jobs through such a “vacancy chain” until eventually someone from outside the local area fills a job in the chain or a vacancy goes unfilled (Chase, 1991). To our knowledge, no college or university impact study has addressed this possibility.

^{xiii} Only rarely do the studies consider effects of the college on property values or the value of amenities and negative consequences that accompany a large agglomeration of young adults and complementary commercial activities, including bars and football stadiums, in a concentrated area. Gumprecht (2005) catalogues various effects a college has on its host community.

^{xiv} This conclusion is based on a survey of Vanderbilt freshmen, and the fact that the University of Wyoming is the only four-year college in that state.

^{xv} See below for a discussion of first-round expenditures (Section 5) and multipliers (Section 6). Furthermore, the amenities of a college town, such as Eugene, Oregon, or Chapel Hill, North

Carolina, may attract high-value residents, including retirees, whose local expenditures serve as exports.

^{xvi}For example, an impact study by Duke University applies a spending multiplier of 2 to estimate its effect on Durham (“Duke University Economic Impact Year 2000 Report,” Duke University Office of Public Affairs, 2003). The multiplier was chosen as representative of other studies, but a multiplier of 2 is more appropriate for studies focused on larger areas (like states) than cities (which experience more leakage outside the area, and thus have lower multiplier effects).

^{xvii}The revenues and expenditures of university hospitals usually dwarf the rest of the institution. Seldom do medical center expenditures contribute much to local economic development, however. Teaching hospitals usually are surrounded by other acute care medical facilities. In such circumstances, were the university hospital to evaporate, most of the medical services provided by it would be assumed by other local hospitals. Only patients with specialized medical problems would likely turn to hospitals outside the area. Thus, most university hospital expenditures should *not* be included in the first round of expenditures, perhaps an exception being isolated university hospitals that serve broad geographic areas in the plains and mountain states.

^{xviii}This approach assumes that the college spends exactly the revenues it receives each year. To the extent that the institution spends more than it receives in annual revenues, as is the case nearly everywhere, “export sales” are understated, because the deficit must be covered by drawing on endowment earnings, and the proportion of endowments that represent funds that would have been spent in the local area if they had not been contributed to the college is likely quite small.

^{xix}The multiplier should reflect the ratio of the difference in the predictions of economic activity derived from the regional economic model estimated with and without the college or university included, to direct expenditures new to the area.

^{xx}At the level of the entire economy, the precise value of the multiplier from some fiscal action – a change in spending or taxes – on the part of the federal government is a controversial and hotly contested issue among macroeconomists.

^{xxi}Tripp Umbach “University of Iowa: Economic Impact Study” September 30, 2010.

^{xxii}“Economic Impact on the State of Maine: The Connection between the University of Maine System and the State of Maine” Maine’s Public Universities. September 2007.

^{xxiii}Tripp Umbach “The Economic and Societal Impact of the University of Washington: Executive Report (FY 08-09)” July 7, 2010.

^{xxiv}“Squeezed Cities Seek Some Relief From Nonprofits,” by Michael Cooper, *The New York Times*, page A1, May 12, 2011.

^{xxv}“Cities Challenging University Tax Status,” *cnn.com*, March 16, 2004.

^{xxvi}Bay Area Economics, “Northwestern University’s Economic Impact on Evanston, Illinois” Northwestern University, University Relations, 2006, page 16.

^{xxvii}“Squeezed Cities Seek Some Relief From Nonprofits,” by Michael Cooper, *The New York Times*, page A17, May 12, 2011.

^{xxviii}Bay Area Economics, “Northwestern University’s Economic Impact on Evanston, Illinois” Northwestern University, University Relations, 2006, page 29.

^{xxix} “Frigid North Dakota Is a Hot Draw For Out-of-State College Students,” Kevin Helliker, *The Wall Street Journal*, Page 1, July 16-17, 2011.

^{xxx} The notion that education enhances social cohesion has been in the economics literature since Smith (1776, BK. V, CH. I, PT. III, Article II). For examples of the link between aggregate education and growth in the economics literature, see Lucas (1988) for theory and Glaeser, Scheinkman, and Schleifer (1995) for empirics.

^{xxxi} Several subsequent college impact studies have claimed graduates’ future earnings as college impacts. Bluestone studied the University of Massachusetts, Boston. Impact studies for Arizona State University, University of Maryland system, and Michigan public universities also have included human capital.

^{xxxii} In a few cases the location of university science or engineering faculty and/or Ph.D. students may attract an employer to a particular area, but these occurrences are few and far between in the universe of about 2,000 four-year colleges and universities.

^{xxxiii} Bay Area Economics, “Northwestern University’s Economic Impact on Evanston, Illinois” Northwestern University, University Relations, 2006, page 13.

^{xxxiv} Bishop, Greg “At Ohio State, Football Scandal Rattles a Reformer” *The New York Times* August 13, 2011.

^{xxxv} SRI International. “The Economic Impact of Michigan’s Public Universities” Michigan Economic Development Corporation. May 2002, page 3.