

ESTIMATING THE ECONOMIC IMPACT OF UNIVERSITIES: THE CASE OF BOWLING GREEN STATE UNIVERSITY

Michael C. Carroll

Center for Regional Development and Department of Economics
Bowling Green State University
Bowling Green, Ohio 43403

Bruce W. Smith

Center for Regional Development and Department of Geography
Bowling Green State University
Bowling Green, Ohio 43403

Abstract

Because of the changing financial climate facing public higher education, university administrators are seeking concrete economic justifications for their budget requests from state legislatures. Consequently economic impact studies, which provide such information, are increasingly on the “radar scope” of university administrators. The purpose of this paper is to describe the results of a recent economic impact study of Bowling Green State University, Ohio. The most widely cited finding of the study was that for every dollar Bowling Green State University received in state support it returned a conservative estimate of \$8 in economic activity to Ohio’s economy. In addition, the advantages to geography and geographers of being involved in such studies are addressed.

INTRODUCTION

Higher education institutions in the United States are in an era of increasing financial pressures (Zumeta 2003). As Alexander (2000 p. 411) observed: “Governmental authorities are no longer as receptive to the traditional self-regulatory processes that have dominated university development for centuries.” A new economic motivation is driving states to redefine relationships by pressuring institutions to become more accountable, more efficient, and more productive in the use of publicly generated resources.” Maximizing economic returns is

increasingly important to state legislators who must balance requests for higher education funding against a plethora of other financial needs, such as prisons, Medicaid, K-12 education, and the like (Zumeta 2003). In addition, universities are expected to become an engine of economic preparing an increasing percentage of the population to be productive members of the high tech workforce (Alexander 2000).

Ohio is not immune to such trends. In 2003, the Governor of Ohio formed the Commission on Higher Education and the Economy (CHEE) to address three

issues: “delivering results for public investments”, “making Ohio competitive in the knowledge economy” and “promoting access and creating opportunities for all students.” (Governor’s Commission on Higher Education and the Economy 2004 p. 3). While the CHEE report asserted that higher education significantly contributes to the state’s economic vitality, it relied on documentation from studies in other states because: “The State of Ohio has not conducted a full-scale analysis of higher education’s contributions to the state’s economic vitality and to the prosperity of the communities served by these institutions.” (Governor’s Commission on Higher Education and the Economy 2004 pp. 11-12). Within that political context, Bowling Green State University (BGSU) commissioned an economic impact study of the University.

The purpose of this paper is to describe the methodology and results of a university impact study, specifically BGSU. Because these studies are on the “radar scope” of university administrators looking for economic justifications for their budget requests (Brown and Heaney 1997), there are benefits to becoming involved in such endeavors. Those advantages that pertain to geography and geographers will be addressed.

METHODOLOGY

The region of analysis selected was the State of Ohio, mainly because BGSU is state-supported. The audience for this study was intended to be state legislators who make decisions about BGSU’s funding in the state budget. Other impact studies have included the institution’s impact on the local community (Blackwell et al. 2002; Booth and Jarrett 1976), but that regional delineation was not relevant in this research due to the audience being addressed.

The 2002 audited financial reports of the University were the bases of the analysis, including university expenditures on items such as purchases of tangible goods and related services, staff payroll, capital improvements, physical plant and inventory. In addition, revenues, such as interest income, grants and appropriations, gifts, and sales of auxiliary goods, were included. In contrast to other university impact studies, all the revenue and expenditure transactions were reconciled and any non-cash transactions, such as depreciation, accruals, etc., were eliminated. These non-cash transactions are bookkeeping transactions only and therefore have no impact on the local economy.

The BGSU study employed an input\output model designed by the IMPLAN Group to make the primary economic forecasts (MIG

Inc. 2004). Input\output methodology allows the examination of forward and backward linkages that are present in any regional economy. The model measures the total annual economic activity that results from inter- and intra-industry transactions. The model breaks the economy into approximately 500 separate sectors with each sector representing an individual industry. It then uses a sectoring scheme developed by the IMPLAN Group (MIG Inc. 2004). The model is approximately a 500 by 500 matrix that shows all transactions between the individual sectors. The entries in the matrix are based on the dollar amount that each industry sells to (and purchases from) other industries in the Ohio economy. It measures the amount of final consumption by the residents of the region, as well as how much each industry exports from the area. The model uses data collected at the county level, which are obtained from the IMPLAN Group (MIG Inc. 2004) and the BEA (U.S. Department of Commerce 2003).

Input\output models estimate economic impacts by taking advantage of the relatively stable patterns in the flow of goods and services within the economy (Leontief 1986). Predictions can be made about an industry's total economic impact by examining the purchasing patterns of the individual sectors. The BEA

collects extensive data on these regional trade flows and reports their findings annually (U.S. Department of Commerce 2003).

This study used IMPLAN's Type III multipliers, which include the direct, indirect, and the induced effects (MIG Inc. 2004). The direct impact includes the purchases of resources (labor, goods, and services) as the University fulfills its academic mission. The indirect impact occurs through business-to-business purchases resulting from the university's interactions with its Ohio suppliers. Finally, the induced impact reflects the change in household demand as those employees of the University and BGSU suppliers' employees earn dollars for consumer spending. Therefore, the total impact to the economy is the summation of the direct, indirect and induced components. The indirect and the induced portions are commonly known as the multiplier, which shows how the initial (direct) expenditures get multiplied through the economy. Calculating the multipliers based on the supplier relationships and employee consumption patterns are much more accurate than simple multiplier tables used in some studies (Stewart et al. 1989).

Some of the problems associated with other impact studies were not pertinent in this case. For example, Blackwell et al. (2002) were concerned with the impact

on the local urban area and therefore argued that one must incorporate the import substitution impact of students who would have attended an out-of-town institution had they not gone to the local university. According to BGSU's Admissions Office, most students not opting for BGSU attend another Ohio institution so this impact is negligible since the region of interest is the state.

Another impact included by some researchers is the enhancement of the region's technological base resulting from firms locating nearby to facilitate tech transfer from the institutions research (Blackwell et al. 2002). Because BGSU is largely an undergraduate institution located in a predominately agricultural area, tech transfer was not considered.

One thorny issue is the role of human capital in university economic impacts. Bluestone (1993), among others, argued that projects should take into account the fact that universities add to the skill base of the region and their graduates earn higher incomes than they would without that education, and therefore contribute more to the economy. Measurement of this impact is problematic and controversial (Blackwell et al. 2002). We concur with the view that inclusion of a measure of human capital impact will substantially overestimate

the impacts and "... conservative assumptions and methods should be used to promote objectivity in the research process (Brown and Heaney 1997 p. 237). A conservative approach is particularly desirable since some have criticized methodologies that may inflate the impacts (Beck et al. 1995; Potter 2003). Consequently no estimates of the contribution of BGSU to the formation of human capital in the state were included. Instead we are just measuring the impact of the economic activities of BGSU.

RESULTS

The economic impact of the University was attributed to four types of expenditures. In order of size of impact, they are: capital improvements and operating expenditures, employee spending, student spending, and visitor spending. The size of each are briefly described (Table 1).

Capital Improvement and Operation Spending

Combined capital improvements and operation spending was calculated from the University's audited financial statements. To avoid double counting, payroll amounts were deleted since the impact of employee spending is described later in this report. Also non-cash transactions such as accruals, and depreciation were eliminated, as they have impact on the economic community. After making the necessary adjustments, BGSU spent \$179.4

million directly on capital improvements and operations in 2002. This initial spending in turn generated an additional \$52.7 million indirectly through the University's purchase of labor and raw materials from local sources. The induced component, \$89.9 million, was generated as the employees of suppliers spent the wages earned from University contracts. The total economic impact is the summation of the direct, indirect and induced effects. In this case, the University's total impact from operations and capital improvements is \$321.9 million.

From an employment perspective, BGSU created 5,472 full-time jobs as a result of their operations and capital improvement activities. Of the 5,472 jobs created, 3,667 were the result of direct university construction and operation activities, 715 resulted from the business-to-business, or indirect, activity, and 1,090 resulted from suppliers' employees' spending.

Employee Spending Impact

The second largest impacts were derived from BGSU employee spending. BGSU paid \$142.0 million in gross salaries (excluding benefits) in 2002. To determine possible employee spending, it is first necessary to subtract the amount of taxes and other deductions from gross pay. Following the Bureau of Labor Statistics (BLS) guidelines for our region, it was assumed that, on

average, 85% of the gross pay, or disposable income, was available for consumption (U.S. Department of Labor 2003). The 85% may appear high but it is assumed that state and local taxes are spent in the Ohio economy and therefore were added back. Therefore, it was assumed that the portion of University salaries available for consumption was \$120.7 million. This was then allocated into spending categories (food, housing, healthcare, etc.) based on the BLS Consumer Expenditure Survey. This survey estimates the typical household spending patterns for our region for middle-income (\$35,000 to \$50,000 annual income) consumers. It was assumed that the bulk of the employee consumption spending (food, clothing, and transportation) was in Ohio, which is consistent with BLS research on local consumption spending. The direct spending of \$120.7 million generated an indirect impact of \$24.3 million and an induced impact of \$22.6 million. Thus the total impact of employee spending was \$167.6 million in the Ohio economy. This level of spending supported 1,439 jobs in Ohio.

Student Spending Impact

Student spending was estimated for three distinct categories. Undergraduate students who reside in on-campus facilities were the first group. This category has the lowest economic impact as the bulk of their spending occurs at

University facilities, which was included in the university operations estimates. The second category of student spending is undergraduate students residing in off-campus housing. This impact is significantly higher as the living expenses are often expended at local rental agencies and businesses. The last category of student spending is graduate student spending. Spending from graduate students tends to be higher than undergraduate spending. This is traditionally due to higher stipends for graduate students and from additional family income of a locally employed spouse.

Table 2 shows the number of students per category and the annual budget amounts for each group. BGSU has very few graduate students in on-campus facilities so all graduate students were considered to be off-campus. The budget estimates are based on University figures.

Similar to employee spending, the direct amount was allocated into spending categories based on the BLS Consumer expenditure Survey for households in the local region making under \$15,000 per year. Again it was assumed that the bulk of the spending occurred in Ohio.

Direct spending of \$136.5 million generated \$28.2 million in indirect activity and \$26.2 million in induced spending. Thus, the total

impact in Ohio of BGSU student spending was \$190.9 million. This level of consumption in turn generated 1,636 Ohio jobs.

Visitor Impact Spending

Estimating visitor spending in these studies is always difficult. One method is to simply use some estimated percentages of the university impact, but this is not always accurate and does not capture any unique student or university activities. Another method is to use surveys at a sample of University events, but cost considerations precluded the survey approach. Furthermore, given the regional nature of BGSU and the fact that the state is the service area for this study, the number of out-of-state visitors for each event would be small. Another method for estimating visitor spending in a regional university is to base it on the number of visitors per student and faculty member (Appleseed 2003; Bay Area Economics 2002). The number of students and faculty provides a good foundation and measuring personal visits from out of town friends and family is a good proxy for all visitor categories. The faculty number includes professional visitors who may attend conferences presented by faculty from BGSU.

It is estimated that undergraduate students have 5.95 overnight visitors annually; graduate students have 3.12, and faculty have 4.32, with each

Table 1. BGSU'S ECONOMIC IMPACT ON OHIO (Millions of dollars)

Expenditure	Direct	Indirect	Induced	Total
University Spending	\$179.4	\$52.7	\$89.9	\$321.9
Employee Spending	120.7	24.3	22.6	167.6
Student Spending	136.5	28.2	26.2	190.9
Visitor Spending	14.5	3.9	5.9	24.4
Total	\$451.1	\$109.2	\$144.6	\$704.9

Table 2. STUDENT SPENDING

	Students	Annual Spending per Student	Total Spending (millions of dollars)
Undergrad on-campus	6,835	\$2,550	\$17.4
Undergrad off-campus	10,382	\$8,050	83.6
Off-campus graduate	3,142	\$11,300	35.5
Total	20,359		\$36.5

person spending approximately \$125 per visit (Carroll et al. 2004). The graduate student and faculty numbers are lower than the undergraduates because graduate student and faculty often stay as guests in their residences. Based on the 2002 student enrollments and the numbers shown above, the estimates of direct visitor spending is shown, it is estimated that \$14.5 million of direct spending by visitors generated an additional \$3.9 million in indirect impacts, \$5.9 million in induced impacts for a total of \$24.4 in economic activity. This economic activity supports 1,636 Ohio jobs with the bulk of the jobs being in Wood County.

Fiscal Impact

In 2002, BGSU received \$84.6 million in state appropriations. During that time period, the BGSU economic activity generated \$85.9 million in tax revenues. The total economic impact of BGSU on Ohio's economy was \$704 million. Therefore, for every dollar BGSU receives in state support, it generates more than \$8 in economic activity. This is not to say that BGSU has a multiplier of eight. What it does mean is that BGSU takes the state appropriation, couples it with tuition and grant revenues, and produces the \$704 million dollar impact. The overall multiplier, generated from this study, is a very conservative 1.56. This number is derived by dividing the total impact by the direct effect.

DISCUSSION

As noted by various researchers, direct comparisons of the results of this study with other similar studies are problematic due to variations in the methodology (Beck et al. 1995). Nonetheless it is worthy of note that the impact of BGSU (\$8 generated for each dollar from the state) is less than reported in some other studies. For example, a Michigan study reported that for each dollar spent on Michigan universities, the state of Michigan gets \$26 back and a study of New Jersey community colleges reported that the state benefited by \$18 for each dollar spent on the colleges (Potter 2003 p. A26). Finally Pittsburgh State University concluded that \$18.20 was returned for every state taxpayer dollar appropriated to Pittsburgh State (President's Economic Impact Assessment Task Force 2002 p.5). In general, the BGSU estimate is low, in part due to the conservative assumptions that were made. Considering that economic impact studies have been criticized for being too broad and self-serving (Potter 2003; Brown and Heaney 1997), a conservative approach seemed prudent.

While university administrators may find economic impact studies to be useful, that does not mean that they can correctly interpret all the analysis. For example, one BGSU administrator thought the analysis would identify efficiencies, or the lack thereof, in university offices, which obviously

is not necessarily true. Consequently, simply generating a written technical report is not sufficient. At BGSU, the report was orally presented to numerous senior administrative committees with contextual remarks for clarification. One of those groups was the Board of Trustees, which is BGSU's governing body appointed by the Governor of Ohio. Many trustees are from the business community. Comparisons of state spending on BGSU with state and local incentives to manufacturing companies resonated well with many of them. For example, Ohio appropriations were less than \$10,000 per BGSU employee in 2002. In contrast, local newspapers reported that Ohio and local governments spent \$250,000 per job to land a centrifuge plant (Rulon 2004 p. 3) and \$57,142 per job to attract an auto plant (McKinnon 1999 p.10). Obviously these comparisons must be carefully crafted and explained, but nevertheless these data provided a meaningful perspective for the business representatives.

Because senior administrators look to economic impact studies to provide economic justification in their lobbying for state resources, it is beneficial for faculty to participate in these studies. In this context, geographers often fret about the status of the discipline, both nationally and within institutions. The following statements by Bierly and Gatrell

(2004 p. 337) are one example: "Given the continuing evolution of their discipline, geographers are compelled to periodically assess the overall condition of its institutions. Are the number of geography departments, programs, and faculty positions growing or shrinking? How has the scope of geography (or the number of geographies) changed in recent years? Historically, geographers have assumed the worst. The anecdotal evidence geographers share with one another at national meetings and in AAG newsletter columns has generally not been positive with respect to the health of geography, geography programs, and/or the shifting disciplinary identities of programs and geographers." Various geographers have suggested methods by which geographers and geography can increase their visibility. For example, Harman (2003) contended that geographers' research agendas must address important human issues. In addition, Harmon (2003 p.420) argued: "If, as individuals, we create valuable products, then our discipline will be valued in the aggregate." While Harman was primarily addressing a larger scale than simply one university, his ideas make sense in terms of helping geographers compete for increasingly scarce resources within their home institutions. In today's funding climate for higher education, many senior administrators would view

economic impact analyses as a valuable product.

CONCLUSIONS

State tax dollars to support higher education are becoming scarcer in many states, including Ohio, and senior administrators in universities are seeking information to buttress their funding requests. Economic impact studies are one source of such information.

From the viewpoint of BGSU's leadership, the most significant outcome of this analysis was that BGSU received \$84.6 million in state appropriations in 2002, but the total economic impact of BGSU on Ohio's economy was \$704 million. For every dollar BGSU received in state support, it generated more than \$8 in economic activity. This figure for BGSU is low in comparison to other university impact studies, largely because of the conservative strategy adopted. In particular, no estimates of the contribution of BGSU to the formation of human capital in the state were included. Although this is an important benefit of higher education, there is no accepted method of measurement, and its inclusion can result in inflated multipliers

Since senior administrators are looking to economic impact studies to provide economic justification in their lobbying for state resources, it is beneficial for faculty to participate in these

studies. Because many geographers are knowledgeable of this technique, economic impact analyses of this nature may provide a venue for "catching the eye" of the upper echelon, which may prove valuable in the internal competition for scarce resources.

REFERENCES

- Alexander, F.K. 2000 The Changing Face of Accountability: Monitoring and Assessing Institutional Performance in Higher Education. *The Journal of Higher Education* 71:411-431.
- Appleseed. 2003 *Engines of Economic Growth: The Economic Impact of Boston's Eight Research Universities on the Metropolitan Boston Area*. Boston: Association of Independent Colleges and Universities in Massachusetts. [<http://www.masscolleges.org/Economic/default.asp>], accessed April 2, 2005.
- Bay Area Economics. 2002 *Economic and Fiscal Impacts of the University of Notre Dame du Lac*. South Bend, IN: The University of Notre Dame. [http://impact.nd.edu/PDF/UND_economic_impact_report_2002.pdf], accessed April 2, 2005.
- Beck, R., Elliott, D., Meisel, J. & Wagner, M. 1995 Economic Impact Studies of Regional Public Colleges and Universities. *Growth and Change* 26:245-260.

- Bierly, G.D. & Gatrell, J.D. 2004 Structural and Compositional Change in Geography Graduate Programs in the United States: 1991-2001. *The Professional Geographer* 56:337-344.
- Blackwell, M., Cobb, S. & Weinbert, D. 2002 The Economic Impact of Educational Institutions: Issues and Methodology. *Economic Development Quarterly* 16: 88-95.
- Bluestone, B. 1993 *UMASS/Boston: An Economic Impact Analysis*. Boston, MA: John W. McCormack Institute of Public Affairs, the University of Massachusetts.
- Booth, G.G. & Jarrett, J.E. 1976 The Identification and Estimation of a University's Economic Impacts. *The Journal of Higher Education* 47: 565-576.
- Brown, K.H. & Heaney, M.T. 1997 A Note on Measuring the Economic Impact of Institutions of Higher Education. *Research in Higher Education* 38: 229-240.
- Carroll, M., Benedict, M.E. & Hoag, J. 2004 *The Economic Impact of the Toledo Zoo: A Local and National Analysis, 1998-2002*. Toledo, OH: The Toledo Zoo.
- Governor's Commission on Higher Education and the Economy. 2004 *Building on Knowledge, Investing in People: Higher Education and the Future of Ohio's Economy*. Columbus, OH: State of Ohio. [http://www.chee.ohio.gov/documents/CHEE_4_22.pdf], accessed April 2, 2005.
- Harman, J. 2003 Whither Geography? *The Professional Geographer* 55: 415-421.
- Leontief, W. 1986 *Input-Output Economics. second edition*. Oxford: Oxford University Press.
- McKinnon, J. 1999 Is Toledo Paying Too Much To Much To Keep Jeep?. *The Blade*, September 12, Section A, p. 10.
- MIG, Inc. 2004 *IMPLAN User's Guide*. Stillwater, MN: Minnesota IMPLAN Group, Inc
- Potter, W. 2003 Public Colleges Try To Show Their Value to States, But Not Everyone Is Convinced. *Chronicle of Higher Education*, May 9, p. A26.
- President's Economic Impact Assessment Task Force 2002. *Pittsburgh State University Economic Impact Statement*. Pittsburgh, KS: Pittsburgh State University. [<http://www.pittstate.edu/pres/Report652.pdf>], accessed April 20, 2005.

Rulon, M. 2004 State's \$125M incentive package landed \$1.5 billion centrifuge plant. *Sentinel-Tribune*, February 21, p. 3.

Stewart, T.J., Prinzing, J.M., Dias, J.K., Bowden, J.T., Salley, J.K. & Smith, A.E. 1989 The Economic Impact of a Historically Black College Upon its Local Community. *The Journal of Negro Education* 58: 232-242.

U.S. Department of Commerce. Bureau of Economic Analysis. 2003 *State and Local Personal Income, State Annual Estimates, 2003*. [<http://www.bea.gov/bea/regional/data.htm>], accessed May 22, 2005.

U.S. Department of Labor. Bureau of Labor Statistics. 2003 *Consumer Expenditure Survey, 2003*. [<http://www.bls.gov/cex>], accessed May 19, 2005.

Zumeta, W. 2003 Higher Education Finances in Recession. *The NEA 2003 Almanac of Higher Education*. Washington, DC: The National Education Association. [<http://www2.nea.org/he/healma2k3/a03p53.pdf>], accessed April 1, 2005.