



Regional Dynamics & Economic Modeling Laboratory

THE IMPACT OF CLEMSON UNIVERSITY
on the State of South Carolina
(Condensed Report)

Robert T. Carey, Ph.D.
rob@sti.clemson.edu

Strom Thurmond Institute
Clemson University
Perimeter Road
Clemson, SC 29634-0125

Phone: 864-656-4700
<http://sti.clemson.edu>

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Clemson University is a state university located in the Upstate of South Carolina. As of 2010, the University employed a total of 8,226 faculty, staff, and student and other full and part-time workers at its main campus in Pickens County, including the Athletic Department, and at its activities in Greenville and Anderson Counties. Additionally, Clemson's Public Service Activities (PSA) employed 947 faculty and staff around the state in that year, and 192 persons were employed by the Conference Center & Inn at Clemson University. 2010 enrollment was approximately 19,500, including graduate and undergraduate students.

Given Clemson's employment and large student population, the University is widely recognized as a major economic driver in the Upstate region. This study by the Regional Dynamics & Economic Modeling Laboratory at the Strom Thurmond Institute used an Input-Output model to estimate the total economic impact of the University on the Upstate and on the entire state over the period from 2001 to 2010. The study also estimated the University's fiscal impact on state and local governments.

The Model

Input-Output (I/O) models operate by considering linkages between industries and the effects of consumer spending on regional economies. Jobs created by the University have direct, indirect, and induced effects. Direct effects are the actual University jobs, their wage income and operational spending by the University itself. Indirect effects are the impacts on jobs, wages, and output of suppliers and vendors to the University (i.e., those industries linked to the University through economic exchange). Induced effects are the "ripples" into the broader economy that come about through employees of the University and its suppliers spending their wage income; induced effects generally impact service and retail jobs, medical jobs and jobs in other types of industries that are directly or indirectly linked to serving consumers. The economic and fiscal impacts reported in this study include direct as well as indirect and induced effects.

The I/O model used by the Laboratory is the Regional Dynamics (REDYN) model, currently the largest computer model of the U.S. economy ever constructed. In estimating the impact of Clemson University on the state, the model considers the flow of trade between counties within South Carolina, as well as that between South Carolina and the remainder of the nation, taking into account the cost of transporting goods and services into and out of each region.

Data input to the I/O model included the number of persons employed and operational spending, including wages, by the University at its main campus in Pickens County, its activities in Anderson and Greenville Counties, and at extension offices and other Public Service Activities located in every county around the state. Also included in the model was spending by visitors to the main campus and attendees of athletic events in each year, and spending by students

attending classes at the main and Greenville campuses. University capital expenditures (spending on buildings and equipment) was also included in the model.

While the number of visitors and attendees of athletic events, as well as student enrollment, were provided by the University, assumptions had to be made regarding spending by these individuals while they were present at the University. Wherever possible, the most conservative assumptions were made in order to avoid in any way overstating their impact. Perhaps the most conservative assumption made for the model was to completely exclude students and visitors who are “local” to Clemson (or are from within South Carolina, for purposes of the statewide impact estimates), as their spending may have taken place locally independent of their attending Clemson, visiting the campus or attending a sporting event.

Student spending numbers were based upon a 2004 Harris poll that reported that the average college student spends about \$13,000 per year; before inclusion in the Clemson model, this figure was indexed for inflation and adjusted downward proportional to the lower cost of living in South Carolina relative to the remainder of the nation.¹

Visitor spending on meals and retail was based on the federal per diem rate for the region, which allows for only \$46 to \$56 per day per person for spending on meals and “incidentals” (retail purchases). Hotel rates for overnight visitors were based upon a sampling of local hotel room rates, assuming only one night lodging and two persons per room. Only visitors from out of state and half of visitors from the remainder of South Carolina were assumed to lodge overnight.

Public Service Activities

Clemson University’s Public Service Activities are tied to the University’s mission as a land grant university, and consist of research, regulatory and extension programs. Clemson extension offices and research centers are located throughout the state, creating a statewide presence for the University. Modeling the economic activity from PSA therefore involves modeling employment, wages and spending on operations and capital that takes place in each of South Carolina’s 46 counties. The estimated impact from PSA is included in the total impacts reported in this study.

Conference Center & Inn

The Laboratory conducted an economic impact analysis of the Conference Center & Inn at Clemson University in a report completed January 2011. The results from this study are included in the total impacts reported in the following section.

The Conference Center & Inn (CC&I) includes the Madren Conference Center, the Martin Inn and the Walker Golf Course, all located along the shores of Lake Hartwell on Clemson

¹ Harris Interactive, “College Students Tote \$122 Billion in Spending Power Back to Campus This Year” (August 2004), Harris Interactive, <http://www.harrisinteractive.com/news/allnewsbydate.asp?NewsID=835> (accessed June 22, 2011).

University's main campus. The Laboratory modeled both the impact resulting directly from the day-to-day operational spending by CC&I, including wages, and that generated by spending by CC&I patrons in the local economy for the years 2006 through 2010.

Assumptions regarding spending by patrons in the region are similar to those outlined for Clemson visitors above. In order to avoid double-counting visitors, CC&I patrons classified as visiting for certain University-related purposes were subtracted from the number of visitors included in the University impact study.

Results

Estimates of the annual impact of Clemson University on the state as well as on selected regions within the state are presented in Table 1. Impacts are reported in terms of the following metrics:

- *Employment* is the number of jobs created in the state as a result of Clemson's direct, indirect and induced effects. In other words, the jobs reported include those directly employed by the University and those employed by the University's suppliers, as well as jobs created by consumer spending of wage income.
- *Output* is the dollar value of all goods and services produced in the state in each year. This is somewhat broader but analogous to state gross domestic product. The output numbers reported represent the goods and services that would not have been produced in the state but for the presence of the University, all else equal.
- *Disposable income* is effect of the economic activity spurred by the University on household after-tax income, summed across all households in the state. Disposable income is primarily wage income, but it also includes income from dividends, interest and rent.
- *Net Local Government Revenue* is the revenue received by local (county and municipal) governments around the state from all sources, net of expenses. Economic activity generates both revenue sources – through increased sales and property tax receipts, licensing and fees, and so forth – and expenses – through increased demand for public services, like public safety and education, and infrastructure.
- *Net State Government Revenue* is likewise the revenue received by state government from all sources net of expenses.

Employment

In 2010, the final year of the study period, Clemson University directly employed 9,173 individuals, including students and part-time workers, at its locations and activities around the state, plus an addition 192 employed at the Conference Center & Inn. The estimated total impact on employment in 2010 including indirect and induced effects was 24,689, indicating a jobs

multiplier of 2.6. This means that every 10 jobs directly created by Clemson University generates an additional 16 jobs statewide through indirect and induced effects. Clemson's total impact on employment constituted approximately 1.3 percent of all jobs in South Carolina in 2010.²

Output

The impact of Clemson University's economic activity on state output was estimated to be over \$1.8 billion in 2010. This includes "output" by the University (in this case measured by operational spending) from all activities and locations and that generated through indirect and induced effects. The total impact on state output summed over the ten-year study period was approximately \$16.5 billion.

Disposable Income

Households statewide enjoyed an estimated \$980 million in disposable income as a result of University salaries and all income resulting from indirect and induced effects. This means that, on average, each of the 1,801,181 households in South Carolina in 2010 (according to the 2010 U.S. Census) benefited by approximately \$544 in after-tax income. This impact is much greater than the average \$43.61 contributed in taxes per household in that year in support of state appropriations to the University.

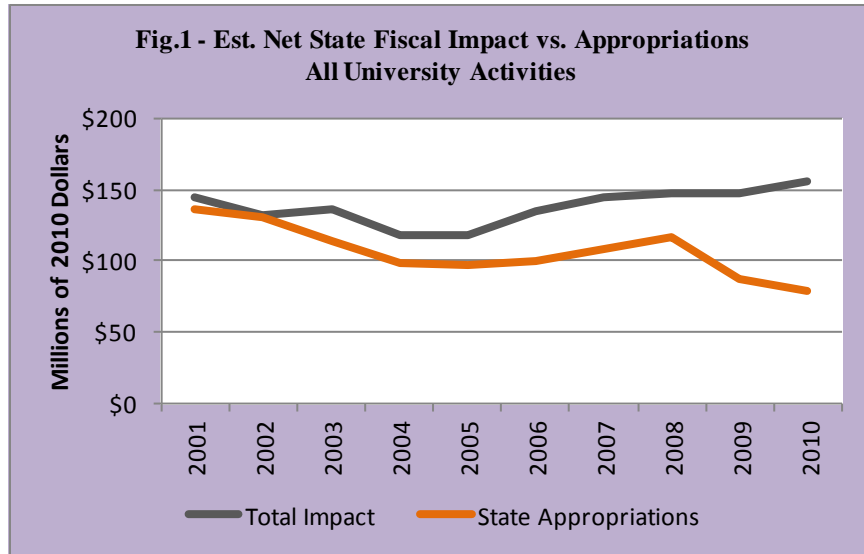
Summed over the years 2001 through 2010, the total aggregated impact on household after-tax income was some \$8.6 billion.

Net State and Local Government Revenue

County and municipal governments across the state netted an estimated total of \$101.8 million in revenue in 2010 as a result of the economic activity associated with Clemson University.

State government netted approximately \$156.0 million in revenue in 2010 due to Clemson's impact on the state economy. This impact, as illustrated in Figure 1, exceeds the amount of total state appropriations to Clemson University in that year by \$77.4 million, demonstrating a net positive return to the state.

² Total South Carolina employment obtained from Bureau of Labor Statistics, Quarterly Census of Employment and Wages.



Conclusion

Clemson University has long been recognized as a major economic driver in the Upstate, particularly in Pickens, Oconee and Anderson counties. This report has demonstrated that the University’s impact beyond this Tri-County region is indeed large, having a substantial impact on the economy of the entire state. This is due to both economic “spillover” from the Upstate into the remainder of the state and a Clemson presence, in the form of research centers or extension services, in each of the state’s 46 counties. The University’s impact on the economy also translates into a substantial return on investment to the state, with the impact on net state government revenue far exceeding appropriations to the University in recent years.

The estimated impacts reported in this study are conservative, because they do not include the effect of amenities (quality of life) associated with the University on drawing businesses and residents to the state over and above those locating here as a result of the income and demand for goods and services generated through University activities. Additionally, impacts from Clemson’s research activities and its contribution to South Carolina’s skilled workforce in the form of its thousands of alumni remaining in the state can be understood to be over and above the impacts reported here.

Estimated Impact per Region (millions of 2010 dollars)

	2001*	2002*	2003*	2004*	2005*	2006	2007	2008	2009	2010
Tri-County Region (Anderson, Oconee, Pickens)										
Employment (Jobs)	11,689	11,789	12,544	12,202	12,305	12,911	13,226	13,443	13,325	13,943
Output	\$748.8	\$705.0	\$742.1	\$705.1	\$708.9	\$758.1	\$787.0	\$851.8	\$822.3	\$859.5
Disposable Income	\$418.9	\$424.5	\$463.9	\$442.1	\$439.4	\$470.2	\$492.9	\$520.6	\$527.2	\$545.8
Net Local Gov. Rev.	\$55.7	\$52.2	\$50.9	\$46.6	\$47.8	\$52.6	\$55.0	\$57.9	\$58.0	\$59.9
Greenville-Spartanburg-Anderson CSA** (Anderson, Greenville, Spartanburg, Pickens, Laurens & Cherokee)										
Employment (Jobs)	18,773	18,778	20,657	19,207	18,887	20,237	20,950	20,986	20,522	21,566
Output	\$1,346.9	\$1,294.9	\$1,442.9	\$1,320.5	\$1,294.5	\$1,413.1	\$1,482.7	\$1,546.5	\$1,489.3	\$1,569.3
Disposable Income	\$597.1	\$607.6	\$690.2	\$634.4	\$624.5	\$682.1	\$721.3	\$744.6	\$741.3	\$777.2
Net Local Gov. Rev.	\$86.6	\$80.6	\$83.8	\$74.1	\$74.0	\$83.7	\$88.6	\$91.2	\$90.4	\$95.6
Columbia MSA*** (Lexington, Richland, Calhoun, Saluda, Fairfield & Kershaw)										
Employment (Jobs)	556	554	605	486	516	565	600	625	642	759
Output	\$50.8	\$50.8	\$57.9	\$47.6	\$51.5	\$58.1	\$62.8	\$66.9	\$67.8	\$76.9
Disposable Income	\$22.6	\$23.2	\$26.5	\$20.6	\$22.4	\$25.6	\$27.8	\$29.6	\$30.4	\$34.2
Net Local Gov. Rev.	\$2.7	\$2.6	\$2.7	\$2.1	\$2.3	\$2.7	\$3.0	\$3.1	\$3.1	\$3.6
Charleston MSA (Charleston, Berkeley, Dorchester)										
Employment (Jobs)	159	155	159	125	109	100	93	80	89	82
Output	\$13.6	\$13.4	\$14.5	\$11.5	\$10.3	\$10.1	\$10.3	\$9.7	\$10.0	\$9.9
Disposable Income	\$7.6	\$7.7	\$8.5	\$6.5	\$5.6	\$5.6	\$5.3	\$5.0	\$5.4	\$5.5
Net Local Gov. Rev.	\$0.7	\$0.7	\$0.7	\$0.5	\$0.4	\$0.4	\$0.4	\$0.3	\$0.4	\$0.4

Estimated Impact per Region (millions of 2010 dollars) - continued

	2001*	2002*	2003*	2004*	2005*	2006	2007	2008	2009	2010
Total South Carolina										
Employment (Jobs)	21,577	21,565	23,883	21,893	21,502	23,061	23,895	23,863	23,440	24,689
Output	\$1,564.1	\$1,508.7	\$1,694.5	\$1,531.4	\$1,501.8	\$1,639.8	\$1,723.6	\$1,790.0	\$1,733.5	\$1,828.8
Disposable Income	\$756.4	\$767.0	\$872.7	\$794.5	\$781.8	\$852.8	\$901.4	\$932.3	\$934.1	\$980.3
Net Local Gov. Rev.	\$104.7	\$97.2	\$101.1	\$88.4	\$88.4	\$100.1	\$106.0	\$108.9	\$108.5	\$114.9
Net State Gov. Rev.	\$144.7	\$132.4	\$135.6	\$118.0	\$118.1	\$134.7	\$143.9	\$147.8	\$147.1	\$156.0

* Estimates for 2001-2003 do not include impacts from visitors to the main campus for non-sports events due to unavailability of data prior to 2004. Estimates prior to 2006 do not include impacts from the Conference Center & Inn and Walker Golf Course.

** Combined Statistical Area

*** Metropolitan Statistical Area

Appendix

Estimated Impact of an Average Clemson Home Football Game

Clemson University home football games are a major economic driver in the Upstate South Carolina area. The average game held at Clemson's "Death Valley" stadium in 2010 had well over 78,000 in attendance, according to University Athletic Department statistics. Of these 78,000 fans, many traveled from outside of the Clemson area. Each of these fans represents potential income to businesses throughout the region. Following is an estimate of how many jobs and how much income is created by game day visitor spending for the average home game weekend. These numbers are reported by county. Clemson is located in Pickens County.

What the Numbers Mean:

Every time someone spends their income on a purchase, that spending creates income for the seller. However, the impact of that consumer's spending does not stop there. The retailer, for example, will use that income to pay its employees, rent on the building and taxes, and to purchase more merchandise. All of this spending by the retailer, in turn, creates income for its employees and its suppliers. The employees and suppliers likewise spend their income. Therefore, the impact from the consumer's initial purchase spreads through the economy like ripples in a pond.

The total impact, including all "ripple effects," from spending by fans attending a Clemson home football game are shown in the following table. Included is spending by fans on meals, souvenirs, and hotel rooms (for those travelling from far enough away to stay overnight). These numbers only include the impact from those travelling from outside of the immediate area surrounding Clemson; this is because it cannot be assumed that those who already live near Clemson would not have spent money there anyway.

One note of caution: Businesses in Clemson and the surrounding area do of course have some "non-local" customers on non-game weekends. Ideally, these customers should be counted against the game-day impact, because they would be spending their income in the area anyway. This is difficult to measure with the available data. It is believed, however, that any effect this may have on the impact estimates below would be small.

Estimated Impact of Average Clemson Home Game

Concept	Anderson County	Oconee County	Pickens County	Tri-County Total	Greenville County	Total South Carolina
Employment	42	13	54	109	73	198
Output	\$1,679,000	\$595,000	\$1,976,000	\$4,251,000	\$4,394,000	\$10,273,000
Local Government Net Revenue	\$102,000	\$40,000	\$93,000	\$235,000	\$198,000	\$542,000
State Government Net Revenue	-	-	-	-	-	\$733,000