



Regional Economic Analysis Laboratory

THE IMPACT OF CLEMSON UNIVERSITY Update through FY 2013

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Related Studies by the Regional Economic Analysis Laboratory:

The Impact of Clemson Public Service Activities on the Economy of South Carolina. Dr. Thomas C. Tanner, November 2008.

The Economic and Fiscal Impact of The Conference Center & Inn at Clemson University. Dr. Robert T. Carey, September 2010.

The Impact of Clemson University, Including the Main Campus and Activities in Anderson and Greenville Counties, on Anderson, Greenville, Oconee, and Pickens Counties and the State of South Carolina. Dr. Robert T. Carey, September 2012.

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I. Introduction

The following is an update to a study released in September 2012 estimating the economic and fiscal impact of Clemson University on adjacent counties in South Carolina and the remainder of the state. The original study examined the impact from University activities and spending by students and visitors over the 2001-2010 fiscal years. This update estimates the impact of the University for the years 2011-2013.

University activities modeled in this study include operations and student and visitor spending at the main campus, the Greenville campuses (including Greenville ONE and the Clemson University Institute for Automotive Research [CU-ICAR]), and the Research Park and other facilities located in Anderson County (primarily in or near the town of Pendleton). Also modeled is the economic impact from Clemson athletic activities, including spending by visitors to athletic events. The impacts from Clemson University's Public Service Activities (PSA), including extension campuses located around the state, and the Conference Center & (Martin) Inn at Clemson University are also included.

This analysis does not assess the amenity, or quality of life, value that the University brings to the region. Amenities, such as the University's botanical gardens, arts and music performances, sports events, and so forth, are important factors in drawing residents and businesses to an area, but these broader impacts are often difficult to quantify. Any institute of higher learning also generates benefits to the community by producing skilled workers, entrepreneurs, and potential community leaders. The economic value generated by these societal benefits is over and above the impacts reported in the following.

II. Model and Assumptions

To estimate the economic impacts of Clemson University on the region and the state, the Laboratory utilized the input-output (I/O) function of the Regional Dynamics (REDYN) economic modeling engine. The REDYN model forecasts a baseline level of activity within over 800 Standard Occupation

Classifications (SOC) and 703 North American Industry Classification System (NAICS) sectors. It also considers distance-to-market and transportation costs in determining the supply and demand of commodities across geographic regions. Changes to employment, income, or demand for products or services by either the private or the public sector can be input to the model. Based on these inputs, the REDYN model generates a county level estimate of the resultant variation from the projected baseline, as well as the effects on every industry.

I/O models use a number of simplifying assumptions, including constant returns to scale (CRS) and fixed input prices. One benefit of such assumptions is that they create a linear model, allowing effects from discrete activities to be modeled separately for scaling purposes and then added together. Therefore, separate models run for each location and activity in this analysis were summed to provide an estimate of the full economic and fiscal impact of the University on the region and the state for each year from 2011 to 2013.

Impacts from normal University operations at each location, including wages, normal operating expenditures, and spending on vendors and outsourced activities, were modeled, along with capital expenditures (construction and equipment purchases), and spending by students. Visitor spending was also modeled for both athletic and non-athletic events.

All of the economic impacts reported in the following report include direct, indirect, and induced effects. Direct impacts are the jobs, wages, and output that are directly attributable to the University; direct impacts are essentially the inputs to the model. Indirect impacts are the jobs, wages, and output attributable to University's vendors and suppliers. Induced effects are the jobs and income created in the broader economy through spending of wage income by the workers employed by the University and its suppliers.

All impacts are reported using the following metrics:

- *Employment* is the number of jobs or job

equivalents created by Clemson University through direct, indirect, and induced effects.

- *Disposable income* is the aggregated household income, less taxes, of all households within the county, region, or state. Disposable income is primarily wage-driven, but also includes income from dividends, interest, and rent.
- *Output* is the dollar value of all goods and services produced within the county, region, or state within a given year. This is broader than but roughly equivalent to regional gross domestic product (GDP).
- *Net local government revenue* is the revenue collected by local (county and municipal) governments from all sources, including taxes, licensing, fees, and intergovernmental transfer, less expenses.
- *Net state government revenue* is revenue collected by state government from all sources, less expenses. Baseline data for state and local government revenue and expenses in the model are based on data from the United States Census of Governments.

A detailed discussion of the methodology and assumptions employed in modeling the impact of University operational spending and student and visitor spending can be found in the original report available at <http://sti.clemson.edu/cu-real/>.

III. Results

Note that all dollar amounts in the following have been adjusted for inflation and are stated in 2010 dollars.

Clemson University's total estimated impacts on Anderson, Greenville, Oconee, and Pickens counties are presented tables A1-A5 in the Appendix.

The University was responsible for approximately 24,579 jobs in South Carolina in 2013, including those directly employed by Clemson and jobs created

through indirect and induced effects throughout the state. As shown in Table A6, the University's impact on employment amounted to about 1.2 percent of total employment in the state in 2012 (the most recent full year for which county-level employment data is available from the BLS CEW).

The total estimated economic impact (impact on state output) on South Carolina in 2013 was approximately \$1.9 billion, while aggregated household disposable income in the state was nearly \$1.1 billion greater than it would have been without the effect of Clemson University on the state's economy. Local governments netted more than an estimated \$128 million in revenue as a result of the economic activity spurred by Clemson activities and student and visitor spending.

State government, which partly funds University operations, netted an estimated \$174.5 million in revenue in 2013. This is in excess of the \$92.7 million in state funds appropriated to the University in that year, indicating a return on investment to taxpayers of \$81.8 million. Broken down by household, state appropriations for the University amounted to \$51.50 for the average household, while the University's estimated impact on the average household's disposable income was \$587.

Total impact estimates by major state region are shown in Table A7.

Appendix

Table A-1. Estimated Impact on Employment			
Region	2011	2012	2013
Anderson	1,509	1,516	1,623
Greenville	5,515	5,944	7,209
Oconee	964	1,068	1,319
Pickens	9,827	9,825	10,373
Region Total	17,815	18,352	20,523
Rest of South Carolina	2,871	3,033	4,056
Total South Carolina	20,686	21,386	24,579

Table A-2. Estimated Impact on Disposable Income (Thousands of 2010 dollars)			
Region	2011	2012	2013
Anderson	\$99,668.2	\$101,272.2	\$114,285.5
Greenville	\$216,843.4	\$232,256.4	\$284,996.8
Oconee	\$85,145.3	\$87,777.9	\$102,214.3
Pickens	\$338,325.0	\$333,744.2	\$370,605.4
Region Total	\$739,981.9	\$755,050.7	\$872,102.0
Rest of South Carolina	\$136,561.7	\$142,791.2	\$184,267.2
Total South Carolina	\$876,543.6	\$897,841.8	\$1,056,369.2

Table A-3. Estimated Impact on Output (Thousands of 2010 dollars)			
Region	2011	2012	2013
Anderson	\$89,281.4	\$89,843.8	\$99,603.0
Greenville	\$477,910.8	\$513,526.2	\$634,455.8
Oconee	\$69,183.0	\$76,308.5	\$95,953.0
Pickens	\$661,984.2	\$663,152.3	\$701,369.0
Region Total	\$1,298,359.3	\$1,342,830.8	\$1,531,380.9
Rest of South Carolina	\$268,398.8	\$280,886.1	\$365,370.4
Total South Carolina	\$1,566,758.1	\$1,623,716.9	\$1,896,751.3

Table A-4. Estimated Impact on Net Local Government Revenue (Thousands of 2010 dollars)			
Region	2011	2012	2013
Anderson	\$12,500.5	\$12,836.1	\$14,751.0
Greenville	\$27,714.1	\$30,091.6	\$37,677.2
Oconee	\$9,139.0	\$9,572.1	\$11,439.4
Pickens	\$34,902.4	\$34,804.8	\$39,388.4
Region Total	\$84,255.9	\$87,304.6	\$103,255.9
Rest of South Carolina	\$17,672.3	\$18,736.2	\$24,958.8
Total South Carolina	\$101,928.2	\$106,040.8	\$128,214.8

Table A-5. Estimated Impact on Net State Government Revenue (Thousands of 2010 dollars)			
Region	2011	2012	2013
Total South Carolina	\$137,797.4	\$143,640.1	\$174,457.5

Table A-6. Clemson University, Estimated Total Employment Impact as Percentage of County, Regional, and State Employment (2012)			
Region	Total Employment*	Estimated Impact	Impact as Per- cent of Total
Anderson	57,322	1,516	2.6%
Greenville	233,974	5,944	2.5%
Oconee	21,904	1,068	4.9%
Pickens	33,201	9,825	29.6%
Region Total	346,401	18,352	5.3%
Rest of South Carolina	1,463,749	3,033	0.2%
Total South Carolina	1,810,150	21,386	1.2%

* Source: BLS Census of Employment and Wages

Table A-7. Estimated Total Impact by Region

Region	Concept	2011	2012	2013
Tri-County Region (Anderson, Oconee, Pickens)				
	Employment	12,300	12,409	13,315
Millions of 2010 dollars	Output	\$820.4	\$829.3	\$896.9
	Disposable Income	\$523.1	\$522.8	\$587.1
	Net Local Gov. Rev.	\$56.5	\$57.2	\$65.6
Greenville-Spartanburg-Anderson CSA (Anderson, Greenville, Spartanburg, Pickens, Laurens & Union)				
	Employment	18,536	19,100	21,454
Millions of 2010 dollars	Output	\$1,388.6	\$1,436.4	\$1,647.2
	Disposable Income	\$732.0	\$750.6	\$874.0
	Net Local Gov. Rev.	\$85.3	\$88.9	\$106.1
Columbia MSA (Lexington, Richland, Calhoun, Saluda, Fairfield & Kershaw)				
	Employment	369	382	436
Millions of 2010 dollars	Output	\$35.8	\$36.6	\$42.7
	Disposable Income	\$16.4	\$16.7	\$19.3
	Net Local Gov. Rev.	\$2.2	\$2.3	\$2.7
Charleston MSA (Charleston, Berkeley, Dorchester)				
	Employment	263	265	361
Millions of 2010 dollars	Output	\$21.1	\$21.3	\$29.3
	Disposable Income	\$11.3	\$11.3	\$15.6
	Net Local Gov. Rev.	\$1.5	\$1.5	\$2.1
Total South Carolina				
	Employment	20,686	21,386	24,579
Millions of 2010 dollars	Output	\$1,566.8	\$1,623.7	\$1,896.8
	Disposable Income	\$876.5	\$897.8	\$1,056.4
	Net Local Gov. Rev.	\$101.9	\$106.0	\$128.2
	Net State Gov. Rev.	\$137.8	\$143.6	\$174.5