Higher education as a (sometimes) engine of local economic growth

Kristin Stowe
Wingate University

Lisa A. Schwartz
Wingate University

ABSTRACT

This research examines the economic impact of colleges and universities in North Carolina's counties, emphasizing areas classified as Tier 1 and Tier 2 by the North Carolina Department of Commerce. Utilizing data from the Integrated Postsecondary Education Data System (IPEDS), IMPLAN, and county-level sources, this study reveals that counties housing higher education institutions exhibit higher median household incomes, younger populations, and greater educational attainment compared to non-college counties. Despite these advantages, many of these counties remain in lower economic tiers, raising questions about the potential barriers to growth. The analysis shows significant differences in industry output, with college counties showing strengths in sectors like educational services and healthcare, whereas non-college counties excel in manufacturing. This paper argues that, while colleges contribute positively to local economies, further collaboration between educational institutions, local governments, and businesses may enhance economic growth.

Keywords: Higher education, Economic impact, Regional development, Economic tiers

INTRODUCTION

Colleges and universities play a pivotal role in their communities, extending their influence beyond academia. They contribute to local and regional economic growth through various channels, including institutional spending, visitor activities, and the economic impact of their students and alumni. For instance, spending by universities on operations and construction boost local economies, while events such as athletic contests and artistic performances draw visitors who boost revenue for restaurants, hotels, and other local businesses. Students contribute through their spending on entertainment, food, and other services. Graduates may start businesses in the county, applying skills learned during their education.

Existing literature provides evidence of the multiplicative economic effects of higher education institutions. Bartik and Erickcek (2007) estimated that every $1 million in university or health care spending generates an average of 28 additional jobs in metropolitan areas. Higher education institutions increase local per capita income by approximately $200 to $500 annually, depending on the region and the scale of the institution's operations. Siegfried, Sanderson, and McHenry (2007) highlight the ripple effects of university expenditures on local goods and services, employment rates, and income levels. Higher education institutions can help build a highly skilled local workforce, attracting industries requiring specialized expertise.

The establishment of colleges enhances local innovation and patenting activities. Universities spur regional economic development through knowledge transfer, human capital formation, and innovation hubs. Regions home to research-intensive universities experiencing an average GDP increase of 1.5% to 3% annually due to innovation-driven economic activity, and every 1% increase in research university funding correlates with a 0.3% rise in local employment (Brekke, 2021).

Regions with research-intensive universities experience heightened patent activity and increased private-sector partnerships, fostering long-term economic stability. By analyzing the establishment of colleges in the U.S., Andrews (2023) found a significant increase in patenting activities, suggesting that research universities in particular serve as catalysts for local invention and technological advancements. Liu (2015) looked at the impacts of the founding of land-grant universities in the late 1800s and found enduring increases in surrounding manufacturing productivity. Kim (2019) showed that state funding, the number of patents granted to public universities, and the entry of new business establishments near a given campus are positively related. The entry effect exists for retail and service sectors yet is largest for small firms in manufacturing (particularly high-technology) that utilize inventions and innovation from the research university.

Smaller colleges also exert influence on their local economies. Khalaf, Jolley, and Clouse (2022) provide a guide for evaluating the economic impacts of smaller colleges, emphasizing the importance of these institutions in rural and less densely populated areas. Their research indicates that small colleges may act as “anchor institutions”, contributing to local economic stability and growth.

Over 700 of the 3000+ counties in the United States are home to a college or university. Counties with colleges and universities exhibit significantly higher levels of civic engagement, social capital, median incomes, and lower mid-life mortalities compared to counties without such

institutions. This suggests a significant positive spillover impact of four-year colleges and universities on their surrounding communities (Brake, 2020).

The University of North Carolina (UNC) system's comprehensive economic impact analysis quantified the significant financial contributions of the state's public higher education institutions. The UNC system adds over $27.9 billion annually to incomes within the state, supporting over 426,000 jobs. This includes both direct spending by the universities and the induced spending resulting from the economic activity generated by the university system (University of North Carolina System, 2015). Independent colleges and universities contribute $14.2 billion to the state's economy (North Carolina Independent Colleges and Universities, 2015). Such data highlight that higher education institutions play a role in bolstering regional economies. The findings also raise the question as to whether all localities with a college are doing well.

METHODOLOGY

Data

This study integrates prior findings with a focus on North Carolina counties. This research highlights comparative economic performance by employing the North Carolina Department of Commerce's tier classification system, which ranks counties based on unemployment rate, median household income, population growth, and property tax base per capita. The state annually classifies its 100 counties based upon economic well-being. Tier 3 is the highest tier, comprised of the economically strongest 20% of counties (20 counties). Tier 2 includes the middle 40% of counties and Tier 1 contains the most distressed 40% of counties. Tier 1 counties are eligible for extra state funding, priority for incentives, and grants to bolster economic development.

The North Carolina Department of Commerce updates county tier rankings annually, reflecting changes in economic conditions. These rankings are relative, meaning that for a county to move to a higher tier, another must shift to a lower tier to maintain the fixed proportion of counties in each tier. In 2023, five counties moved to a higher tier, balanced by five counties moving down, with most changes occurring between Tier 1 and Tier 2. Similarly, 2022 saw twelve counties switch tiers. When counties are tied in their metrics, both are assigned to the lower tier.

Table 1 highlights the average economic indicators for each tier, illustrating contrasts. Counties in the lowest tier face notably higher unemployment—over one percentage point above other tiers—and an average population decline. By contrast, middle and higher-tier counties demonstrate positive population growth, emphasizing the disparities across tiers.
In North Carolina, there are 50 non-profit colleges and universities awarding bachelor's degrees (or higher). Nineteen are located in high-achieving Tier 3 counties; however, 31 are located in Tier 1 and Tier 2 counties (see Table 2). While the schools in Tier 3 counties have smaller average enrollment, the annual spending is notably higher. Note that all of North Carolina's 100 counties are served by a two-year community college, influencing this study's focus on local differences based upon 4-year schools.

Colleges and universities have been found to be positive economic agents (Andrews, 2023; Khalif et al, 2022; Brake, 2020; Kim, 2019; Liu, 2015). The research question arises: "Why do so many counties with colleges and universities remain in the lower economic tiers

despite their presence?" It prompts an exploration of the potential deficiencies or barriers that might be preventing these counties from achieving stronger economic growth. This paper focuses on Tier 1 and Tier 2 counties, both with and without a college, excluding the economically strongest counties, and presents specified comparisons in the following tables to highlight general differences.

Analysis

Overall economic data is presented in Table 3. Counties with colleges have significantly higher median household income, whether measured in dollars or relative to the state's overall median. The counties with colleges also have significantly higher populations, access to broadband internet, computing device access, and residents working within the county. While these college counties appear to be economically stronger than non-college counties, they are still classified as either Tier 1 or Tier 2 and are not strong enough to be classified at Tier 3.

To further assess the economic differences among counties, each county with a college or university was matched with a counterpart without one. Matches were made within the same economic tier, either Tier 1 or Tier 2, and from the same geographical region of the state, prioritizing neighboring counties whenever possible. The final dataset includes 22 pairs of counties. The Wilcoxon signed-rank test was applied to identify significant differences between them. Data availability limits the research to matched pairs rather than the alternative approach of examining counties before and after the founding of a college. Most of North Carolina's colleges were founded in the late 1800s and early 1900s. The few latecomers were founded in the 1950s.

Comparing demographic data for the set of matched pairs, the population in college counties is younger than in non-college counties. Table 4 shows that college counties have a significantly higher percentage of population in age groups 0-19 and 20-34. Non-college counties have significantly higher population in age groups 50-64 and 64+. College counties have significantly more residents with both bachelor's degrees and graduate degrees, while non-college counties have significantly more residents with a high school diploma or less. Other notable significant differences include variations in population density, ethnicity, and language diversity. Counties with colleges have higher population densities, a larger Asian population and number of Asian language speakers, and more non-Hispanic Black residents. Additionally, these counties have a greater proportion of occupied homes and fewer vacant properties.

IMPLAN data offers insights into sector-specific economic contributions, including output, employment, and compensation. Table 5 presents the economic output by industry for counties with and without colleges. Public universities are classified within Government and private universities are classified within Educational Services. Counties with colleges have a significantly higher percentage of output in three sectors: educational services (0.7% vs. 0.2%), health care and social assistance (6.5% vs. 4.5%), accommodations and food services (4.3% vs. 3.4%). Non-college counties have significantly higher percentages of output in manufacturing (33.7% vs. 27.43%) and agriculture, forestry, fishing and hunting (2.3% vs. 7.6%). The differences in educational services and government are expected due to the presence of private and public colleges.

College counties have a higher percentage of residents working in Educational Services. According to Siegfried, Sanderson, and McHenry (2007), higher employment should have a multiplier leading to higher demand for local goods and services. This is evident in the

significantly higher output in areas like Accommodation and Food Services and Health Care and Social Services.

The Manufacturing sector is important to all counties. For college counties, it represents 27.4% of output and 9.7% of employment. Manufacturing is even more important to the non-college counties, with significantly higher output (33.7%) and employment (15.8%). Delving into the differences within the manufacturing sector provides more details on the specific industries. Table 6 shows that the biggest differences in employment between the matched pair counties are Textile Mills, Fabricated Metal Product Manufacturing and Furniture and Related Product Manufacturing, with college counties having lower employment in these areas. According to Kim (2019), college counties should be out-performing in high-tech manufacturing; however, these results do not find any area of manufacturing where college counties produce significantly more output than non-college counties.

While output and employment are important economic factors, so is compensation. College counties have higher compensation in nearly all industrial classifications, as shown in Table 7. The biggest absolute difference is Finance and Insurance, at $10,470 (p=0.05). Manufacturing compensation difference is $9,261 (p=0.01). Other areas where college counties have significantly higher compensation are Retail Trade, Professional, Scientific, and Technical Services, Health Care and Social Assistance and Government. These results support the argument by Siegfried, Sanderson, and McHenry (2007) that the economic impact of colleges and universities can result in higher income levels.

DISCUSSION

Counties with colleges generally outperform their non-college counterparts, yet they continue to underperform compared to other counties across North Carolina. The question persists: why aren't these colleges and universities driving a more substantial economic boost for their counties? This study found that college counties have higher economic output in sectors such as education, health care and social assistance, and accommodations and food services. In contrast, non-college counties derive a greater percentage of their economic output from manufacturing. Future research could explore the allocation of state economic development incentives to determine whether non-college counties are more successful in attracting manufacturing firms due to targeted state resources.

One factor in this analysis is the use of North Carolina's tier system as a measure of economic performance. This ranking system is relative, meaning that for one county to improve its position, another must decline. To improve in the rankings, counties must increase median household income, expand their property tax base per capita, grow their population, and reduce unemployment. Simply growing in lower-income industries is insufficient. Counties must attract industries and employers willing to invest in physical capital and provide jobs that exceed the median income.

Although the tier system provides a useful measurement tool, it should not be the ultimate objective for local leaders. Creating economic growth and stability, no matter the tier, is critical. Colleges and universities can play a role by offering curriculum that is relevant to the region, emphasizing both technical and soft skill development. These institutions have the potential to attract talent and contribute to the overall economic environment in their counties.

The findings indicate that college counties have younger populations with higher educational attainment compared to non-college counties. This suggests that graduates are likely

remaining in their counties, at least temporarily. To retain these individuals over the long term, local businesses must provide opportunities for upward mobility. As Kim (2019) notes, counties with public universities should be experiencing increased patent activity and new business formations, especially in high-tech manufacturing. Collaborative efforts between local leaders and universities could create the conditions needed to spur job creation and business growth, ensuring long-term economic vitality.

CONCLUSION

This study demonstrates that counties with colleges and universities tend to have higher median incomes, younger populations, and greater educational attainment compared to counties without these institutions. However, the question remains: why do many North Carolina counties with higher education institutions persist in lower economic tiers? While moving up the tier system may be challenging due to its relative rankings, improving the county's overall economic profile remains an important goal. Higher education institutions have the potential to serve as engines of economic growth. Higher education leaders are encouraged to question whether their curriculum and resource deployment are aligned with the local region's economic well-being and ability to attract employers for their graduates.

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Table 1

Economic Measures by Tier

	Property Tax Base Per Capita	Population Growth - 3 year	Median Household Income	Unemployment - 12 Month Avg
Tier 3	$ 167,146	6.13%	$ 73,465	3.21%
Tier 2	$ 144,706	1.83%	$ 54,695	3.43%
Tier 1	$ 105,107	-1.50%	$ 46,093	4.39%

Table 2

University Data

	Number of colleges	FTE Enrollment	FTE Staff	Annual Expenses	Graduation Rate	% Students Pell Grants	% Students Exclusively Distance
Tier 1 & 2 counties (Low achievers)	31	6,231	1,541	$ 305,511,196	53.0	46.3	15.4%
Tier 3 counties (High achievers)	19	5,048	1,998	$ 625,978,128	53.0	43.0	14.6%

Table 3

Economic Data

	College County Mean	Non College County Mean	
Median Household Income	$ 53,055	$ 49,708	**
Median HH Income, % of State	85.58%	80.19%	**
Unemployment Rate (%)	41.86%	41.02%	
Taxable Property per Capita	$ 119,602	$ 123,702	
Tax Levy per capita	$ 731	$ 814	*
Local Option Sales Tax Rate	6.9%	6.9%	
Population	143,108	44,872	***
Broadband Internet Access	86.59%	69.35%	***
Computing Device Access	77.47%	73.86%	**
Residents Working In County	69.37%	58.23%	**

*Note: Signficance levels denoted *** 1%; ** 5%, * 10%*

Table 4

Demographic Data

		College County Mean	Non College County Mean	
Population	Population density 2002	248.7	105.8	***
	Population density 2012	276.3	113.8	***
	Population density 2022	291.9	112.7	***
Languages spoken	English only	92.0%	91.0%	
	English and Spanish	3.0%	4.0%	
	English and Asian languages	1.0%	0.0%	*
Ethnicity	Non-Hispanic - White	62.1%	68.9%	**
	Non-Hispanic - Black	22.9%	17.9%	**
	Non-Hispanic - Asian	1.7%	0.9%	**
	Non-Hispanic - American Indian	3.1%	4.8%	
	Hispanic	7.2%	9.2%	
Housing	Occupied	84.5%	80.9%	**
	Vacant - Seasonal	4.8%	6.6%	**
	Vacant - Total	15.5%	19.1%	**

*Note: Signficance levels denoted *** 1%; ** 5%, * 10%*

Table 5

Industry Output & Employment	*Output*			*Employment*		
	College County Mean	Non College County Mean		College County Mean	Non College County Mean	
11 - Agriculture, Forestry, Fishing and Hunting	2.34%	7.35%	***	2.19%	4.65%	***
21 - Mining, Quarrying, and Oil and Gas Extraction	0.28%	0.37%		0.09%	0.15%	
22 - Utilities	1.96%	2.41%		0.24%	0.33%	
23 - Construction	5.68%	5.38%		6.94%	7.45%	
31-33 - Manufacturing	27.43%	33.71%	***	9.74%	15.50%	***
42 - Wholesale Trade	5.07%	5.27%		2.88%	2.82%	
44-45 - Retail Trade	6.48%	5.62%		10.21%	9.63%	
48-49 - Transportation and Warehousing	2.67%	2.32%		4.12%	3.34%	**
51 - Information	1.69%	1.32%		0.63%	0.61%	
52 - Finance and Insurance	4.63%	3.09%		3.36%	2.87%	**
53 - Real Estate and Rental and Leasing	10.24%	9.32%		4.18%	3.84%	
54 - Professional, Scientific, and Technical Services	4.22%	3.25%		4.68%	4.38%	
55 - Management of Companies and Enterprises	0.93%	0.64%		0.87%	0.65%	
56 - Administrative and Support and Waste Management	3.26%	3.10%		6.24%	6.42%	
61 - Educational Services	0.75%	0.22%	***	1.84%	0.78%	***
62 - Health Care and Social Assistance	6.51%	4.51%	**	10.60%	8.77%	**
71 - Arts, Entertainment, and Recreation	0.59%	0.79%		1.50%	2.04%	
72 - Accommodation and Food Services	4.32%	3.01%	**	8.79%	6.66%	***
81 - Other Services (except Public Administration)	2.88%	2.59%		6.35%	6.36%	
90 - Government combined	8.06%	5.72%		14.55%	12.72%	

*Note: Signficance levels denoted *** 1%; ** 5%, * 10%*

Table 6

Industry Employment within Manufacturing

	College County Mean	Non College County Mean	
311 - Food Manufacturing	1.57%	4.03%	*
312 - Beverage and Tobacco Product Manufacturing	3.71%	2.09%	*
313 - Textile Mills	0.50%	0.94%	**
314 - Textile Product Mills	0.15%	0.19%	
315 - Apparel Manufacturing	0.13%	0.24%	
316 - Leather and Allied Product Manufacturing	0.00%	0.06%	
321 - Wood Product Manufacturing	0.54%	1.19%	*
322 - Paper Manufacturing	0.30%	0.73%	
323 - Printing and Related Support Activities	0.15%	0.19%	
324 - Petroleum and Coal Products Manufacturing	0.02%	0.05%	
325 - Chemical Manufacturing	0.79%	0.73%	
326 - Plastics and Rubber Products Manufacturing	0.83%	0.98%	
327 - Nonmetallic Mineral Product Manufacturing	0.46%	0.23%	
331 - Primary Metal Manufacturing	2.88%	1.26%	
332 - Fabricated Metal Product Manufacturing	0.62%	1.23%	**
333 - Machinery Manufacturing	0.61%	0.91%	
334 - Computer and Electronic Product Manufacturing	0.19%	0.18%	
335 - Electrical Equipment, Appliance, and Component Mfg	0.45%	0.28%	
336 - Transportation Equipment Manufacturing	1.10%	0.63%	
337 - Furniture and Related Product Manufacturing	0.57%	2.05%	**
339 - Miscellaneous Manufacturing	0.23%	0.24%	

*Note: Signficance levels denoted *** 1%; ** 5%, * 10%. 2022 data inflation adjusted*

Table 7

Industry Compensation

	College County Mean	Non College County Mean	Difference	
11 - Agriculture, Forestry, Fishing and Hunting	$ 41,191	$ 40,295	$ 896	
21 - Mining, Quarrying, and Oil and Gas Extraction	$ 97,480	$ 100,162	$ (2,681)	
22 - Utilities	$ 136,703	$ 128,386	$ 8,316	
23 - Construction	$ 57,389	$ 54,683	$ 2,706	*
31-33 - Manufacturing	$ 74,682	$ 65,420	$ 9,261	***
42 - Wholesale Trade	$ 80,994	$ 76,614	$ 4,380	
44-45 - Retail Trade	$ 40,701	$ 37,803	$ 2,898	**
48-49 - Transportation and Warehousing	$ 68,917	$ 70,760	$ (1,843)	
51 - Information	$ 81,653	$ 76,651	$ 5,002	
52 - Finance and Insurance	$ 85,334	$ 74,864	$ 10,470	**
53 - Real Estate and Rental and Leasing	$ 58,372	$ 56,620	$ 1,753	
54 - Professional, Scientific, and Technical Services	$ 80,418	$ 73,305	$ 7,113	***
55 - Management of Companies and Enterprises	$ 102,039	$ 99,969	$ 2,070	
56 - Administrative and Support and Waste Management	$ 50,413	$ 47,598	$ 2,815	
61 - Educational Services	$ 46,878	$ 40,047	$ 6,831	
62 - Health Care and Social Assistance	$ 63,321	$ 55,544	$ 7,777	***
71 - Arts, Entertainment, and Recreation	$ 29,032	$ 29,552	$ (520)	
72 - Accommodation and Food Services	$ 26,895	$ 25,060	$ 1,835	*
81 - Other Services (except Public Administration)	$ 48,719	$ 45,682	$ 3,037	
90 - Government combined	$ 73,438	$ 66,357	$ 7,080	***

*Note: Signficance levels denoted *** 1%; ** 5%, * 10%. 2022 data inflation adjusted to 2024 dollars.*