

**Measuring the Economic Impact
of Middle Tennessee State University**

**Murat Arik, Ph.D.
Associate Director**

**Christian Nsiah
Graduate Research Assistant**

**Business and Economic Research Center
Jennings A. Jones College of Business
Middle Tennessee State University
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We gratefully acknowledge the valuable and timely assistance of MTSU's Budget Office, Payroll Services, Records Office, Alumni Relations, Tennessee Livestock Center, Murphy Center, Continuing Studies and Public Service Department, Parking and Transportation Services, and Financial Aid Office in providing detailed data and valuable insights into the complex operation of the university.

I. Introduction

Located about one mile from the geographic center of Tennessee in the City of Murfreesboro, in Rutherford County, Middle Tennessee State University (MTSU) was founded in 1911 as one of three state normal schools for teacher training. MTSU became State Teachers College in 1925, State College in 1943, and advanced to university status in 1965. MTSU is the oldest and largest school in the Tennessee Board of Regents (TBR) educational system. The school is credited with having the largest undergraduate program in the State of Tennessee with 21,623 students and 800 faculty members. MTSU has 140 undergraduate programs and more than 65 graduate programs including doctoral programs. For five years in a row, the school has been the choice of the majority of the Midstate's valedictorians and salutatorians.

This study seeks to estimate the economic impact of MTSU on the economy of the Nashville Metropolitan Statistical Area (MSA) including Davidson, Rutherford, Robertson, Sumner, Wilson, Williamson, Cheatham, and Dickson counties. The study also estimates separate economic impacts for Rutherford County. In so doing this study provides answers to the following questions: What impact does MTSU have on the local economy as a whole? How much business revenue and employment in the Nashville MSA and Rutherford County can be attributed to MTSU?

This study answers these questions using IMPLAN, an input-output model. Since MTSU already exists, in order to identify its contribution to the local economy, we analyze the effects on the local economy if MTSU did not exist. Knowing the difficulties involved in capturing all tangible and intangible benefits accruing from MTSU to the

community, we exercised extreme caution in estimating our inputs so as to avoid double counting; as such, our estimates are the barest minimum.

II. Why Study the University's Impact?

Higher education institutions have been increasingly an integral part of economic landscape in a community, not only for the spending associated with these institutions but also, more importantly, for preparing a skilled workforce that is flexible enough to harvest the benefits from engagement in a highly competitive global economy. The critical element in preparing our workforce for the demands of a changing economy, Alan Greenspan remarks, is to ensure that all members of our community have access to “rigorous education and ongoing training” since the workforce should be flexible enough to make the transition from old to new jobs. The higher education system, he continues, should be able to “serve the practical needs of the economy by teaching and training and, more significantly, by unleashing the creative thinking that moves our economy forward.”¹

MTSU serves communities through first-rate education, lifelong learning, and research. MTSU has been engaging faculty and staff in ongoing campus-wide discourse to address critical skill shortages and provide a lifelong learning environment in line with changing economic demands.

Because of a wide range of MTSU activities, any measure of its impact on the local community will be underestimated. Directly measurable impacts are MTSU's own spending on goods and services, wages, salaries, and supplies and MTSU visitors' and students' spending on food, clothing, transportation, and so on. Moreover, some

¹ These remarks are from Federal Reserve Bank Chairman Alan Greenspan's speech at a conference at Boston College, 03.12.2004.

important impacts of MTSU are difficult to measure. These include (1) providing a better-educated workforce, (2) increasing productivity through professional development and lifelong learning courses, (3) serving the public through applied research, (4) providing leadership to the business community, and (5) improving quality of life through the cumulative effect of all activities cited above.

Given the daunting task of measuring the impact of all MTSU activities, the Business and Economic Research Center (BERC) assessed *only* four kinds of impacts: 1) the impact of university spending (except payroll), 2) the impact of MTSU payroll expenditures, 3) visitors' spending, and 4) students' spending on local economy (Nashville MSA). Using IMPLANPro input-output model configured to local parameters, we produced estimates of these four activities on gross industrial output (total business revenue), employment, and personal income.

III. Modeling Approach

a. Concept of Economic Impact

Spending by the university and students initiates a round-by-round sequence of impacts on local output, payroll, and employment. University spending for goods and services, for example, increases sales by companies that provide these goods and services. These companies purchase inputs including labor, machinery, and supplies and materials in order to produce the additional output. The effect of the initial expenditure eventually works its way through the local economy.

The round-by-round increases in economic activity that characterize the multiplier process become smaller with every round due to leakages from the spending stream. Leakages consist of spending for goods or services that are not produced in the local

economy. For example, university spending for personal computers from a manufacturer in Austin generates no economic impact for the local economy aside from the provision of delivery services.

Economists use multipliers to estimate the sum of the round-by-round effects of expenditures. Typically, multipliers estimate three effects: direct, indirect, and induced. The direct effect consists of the initial change in expenditures. The indirect effect is the sum of the round-by-round increases in business spending for inputs, not including labor. The induced effect is the sum of the round-by-round increases in employee spending due to increased payrolls and household incomes.

b. Economic Impact Model and Modeling Approach

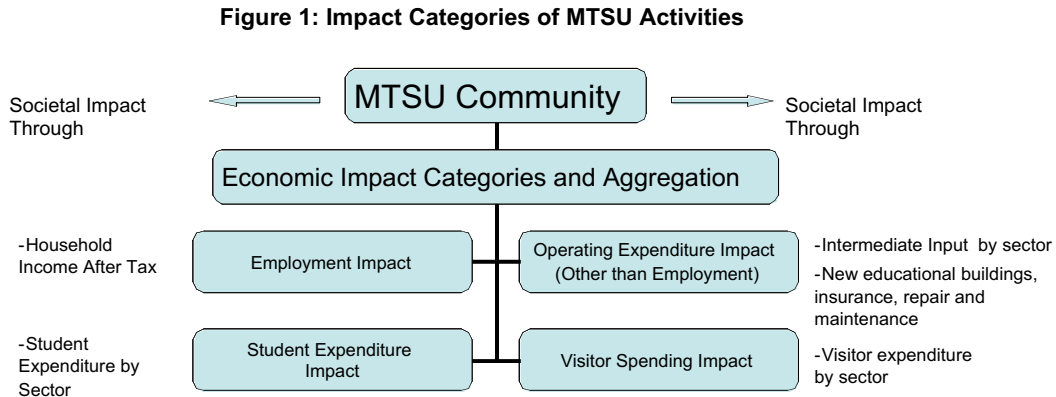
Many economists use IMPLAN (Impact Analysis for Planning) software to help estimate multipliers for local economies. The IMPLAN software package was originally developed by the U.S. Forest Service and is now maintained and sold by a private research company.

c. Conceptual Framework

The basic framework of this study is built around a conceptual model that presents MTSU as an economic entity nested in the greater Nashville MSA economy. Economic impact radiates from the presence of MTSU across the Nashville MSA. The following defines some of the different sectors of the MTSU community considered by this study that have both direct and indirect effects upon the local economy.

Figure 1 presents the framework through which MTSU activities translate into economic and social impact. We quantify impacts for four categories of activities as presented in Figure 1. A detailed explanation of expenditure estimates is provided in the

following sections. Note, however, that for each of the impacts we quantified, we avoided double counting and used conservative values. For visitor spending, for example, only visitors for whom we obtained data were included in this study; no imputed values were included for visitors to the area due to MTSU for whom we do not have data.



Note that this study leaves out all potential impact categories that we could not quantify; therefore, our estimated impact of MTSU on the greater Nashville area and Rutherford County economies is very conservative.

IV. Study Data and Assumptions

a. University Spending (Other than Employment)

MTSU's expenditures for the year 2003 totaled \$216,097,789, allocated to maintenance and operation (M & O), renovation, and payroll. M & O expenses include supplies, utilities, insurance, equipment, and "other." Total non-salary expenditures used in this study amounted to \$115.1 million for expenses on M & O among other categories. In place of actual data documenting where the university expenditure occurs, we acquired vendor zip code data from the Procurement Office to determine what percentage of the school's vendors are in the local area. It was determined that about 60 percent of the

vendors are located in the greater Nashville area and 40 percent within Rutherford County. Based on this vendor information data, we assumed that 60 percent of direct university spending takes place within the greater Nashville area and 40 percent within Rutherford County.

b. University Employee Spending

University employment averaged 3,600 workers during fiscal year 2003 including part- and full-time faculty and staff and temporary student employees. Excluding student employees, the university employed 1,903 full-time equivalents (FTEs), consisting of 825 faculty, 470 staff, and 608 clerical and support staff.

We assume that university employees spend their incomes near where they live. Based on residential addresses of employees, we estimated that 85 percent live within the greater Nashville area; thus, commuter employees made up 15 percent of the total. About 50 percent of employees have residential addresses within Rutherford County.

In order to estimate the impact of expenditures generated by MTSU payroll, we calculated after-tax disposable personal income of university employees (i.e., after Federal Income Tax and FICA Deductions). Our estimated disposable and commuter-adjusted income for MTSU employees for fiscal year 2003 amounts to \$80.7 million. This does not include salaries paid to graduate assistants and student employees since these are included in the impacts of student expenditures.

c. Student Expenditures

Spending by university students is the third major source of the economic impact of the university. Student spending is a very large portion of the university's impact, and its proportion of total impact per year keeps rising since the student population keeps

increasing at a record pace as shown by Figure 2. Increases in student population lead to greater student spending, which in turn increases area retail sales and many other business activities such as real estate transactions, sales by restaurants, and general merchandise sales.

In the 2002-03 academic year, student enrollment was 21,744 (18,735 FTE), with 3,506 living on campus and 18,238 off campus. Table 1 presents the number of off-campus students by county of residence for fall 2002. The majority of students who live off campus reside in Rutherford County. It is quite natural for more students to choose to live in Rutherford County because of the close proximity of the school. Davidson County is home to the second largest population of MTSU students who reside off campus.

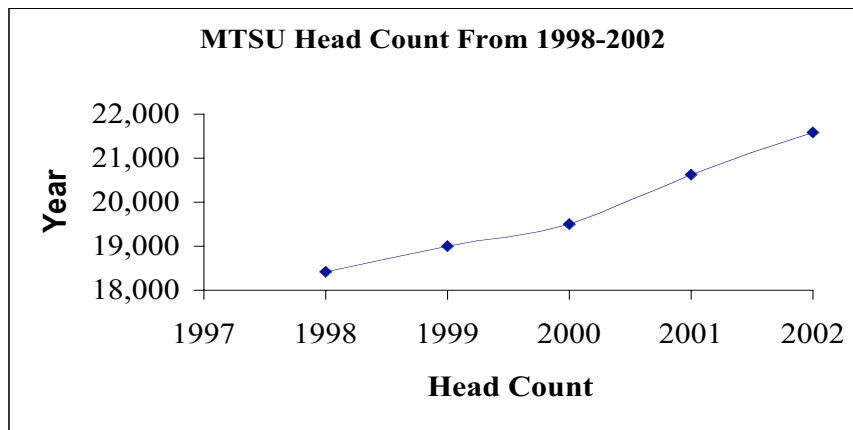


Table 1: Number of Students Residing Off Campus by County for Fall 2002

County	Student Population	% Off-Campus Students
Rutherford	7,730	42.39%
Davidson	4,138	22.69%
Williamson	1,021	5.60%
Wilson	799	4.38%
Sumner	557	3.05%
Dickson	160	0.88%
Robertson	99	0.54%
Cheatham	86	0.47%
Total Nashville MSA	14,590	80.00%
Other Counties	3,648	20.00%
Total Off campus	18,238	100.00%

Data Source: MTSU records office

In order to estimate student expenditures, we obtained student expenditure data from the MTSU Financial Aid Office. According to these figures, student spending averaged \$11,335 per student for the 2002-03 academic year. We assume that if the university did not exist, students from within this area would continue their education at a college outside the metro area. Thus, our study treats all local students as “net new” to the area.

The Financial Aid Office breaks down the estimated \$11,335 estimate into several categories including rent, purchased meals, groceries, transportation, utilities, clothing, and other goods and services. We assume 70 percent of the estimated amount for transportation was spent for gasoline with the other 30 percent for auto repairs. We further assume that for other student expenditures, 50 percent was spent on goods with the remaining 50 percent spent on services. For the students who live on campus, spending for rent, utilities, and 70 percent of their spending on food were not included as student expenditures because they have already been counted as university auxiliary expenditures.

Similar to MTSU employees, we assume that the impact of student expenditures occurs where the students live. Thus, we must include in the impact analysis only those students who live in Rutherford County or in the Nashville MSA. Working with the MTSU Records Office we obtained local and permanent addresses for enrolled students and tabulated the number of student residents in each county. Our estimates show that approximately 43 percent of the student body lives in Rutherford County and 80 percent in the Nashville MSA. Expenditures by students who live outside the Nashville area are not included in our impact figures. We estimate that in 2003 MTSU students spent about \$224.6 million off campus, out of which \$182.4 million was spent in the Nashville MSA and \$108.1 million in the Rutherford County area (see Table 2 for student spending breakdowns).

Table 2: Estimated Off-campus Spending by Students for 2002-03

Categories	Total Off Campus Spending (Millions)	Spending in Nashville MSA (Millions)	Spending in Rutherford County (Millions)
Rent	\$62.80	\$50.20	\$27.60
Utilities	\$16.40	\$13.10	\$7.20
Purchased Meals	\$14.50	\$12.40	\$7.40
Groceries	\$33.90	\$27.20	\$17.60
Gasoline	\$24.50	\$19.60	\$13.70
Auto Repair	\$10.50	\$8.40	\$5.00
Clothing	\$13.70	\$11.60	\$6.40
Medical Care	\$22.40	\$17.90	\$9.80
Other Goods	\$12.90	\$11.00	\$6.60
Other Services	\$12.90	\$11.00	\$6.60
Total	\$224.60	\$182.40	\$108.10

Source of data on student spending: MTSU Financial Aid Office

d. Estimating Visitor Spending Calculations

MTSU attracts many visitors from both within and outside the region for events at Murphy Center, the Tennessee Livestock Center, and statewide high school athletic competitions. Visitors greatly benefit local area lodging establishments and retailers.

Spending by visitors includes spending for lodging in hotels or motels, spending for food and fuel, and retail spending. We identified three types of visitors: 1) overnight visitors, 2) non-local day-trippers, and 3) local day-trippers. Estimated daily visitor spending varies considerably depending on whether the visitor stays overnight and whether the visitor is a local resident.

Visitor spending attributable to MTSU is the product of the number of visitors and average spending per visitor for overnight visitors, non-local day visitors, and local day visitors.² For overnight visitors, we estimated the number of hotel nights and collected information on average hotel rates in Murfreesboro; details are provided in Appendix 2.

Our visitor estimates focus on just a few major events, including activities at the livestock centers, Tennessee Secondary School Athletic Association (TSSAA) events, MTSU sports events held on campus, and daily parking passes obtained from parking services during weekdays. Attendees to these events, however, are only a small fraction of total visitors to MTSU because many events hosted by Murphy Center, events hosted on campus during the week, and other weekend events hosted by the school and its various departments that do not require participants to obtain parking permits thus are not quantifiable for the purposes of this study.

² In the absence of a detailed visitor spending survey for MTSU visitors, we used average visitor expenditure ratios from the Great Smokey Mountains Visitor Surveys in 1999.

d.1. Total Visitor Spending

Estimates of the number of visitors by type are provided in Table 10 in Appendix 2. Using average expenditure figures for visitors to an area attraction,³ we estimated the average per day spending for overnight visitors, non-local day visitors, and local day visitors (Table 10). In estimating average overnight visitor spending, we obtained an average hotel/motel rate of \$55 from a sample of local hotel/motel rates.⁴ We estimated that overnight visitors spend \$107 per hotel night while local and non-local day-trippers spend on average \$13 and \$35 per day, respectively.

Now, using these averages in conjunction with the total hotel nights and day visitor estimates in Table 10, we calculated total visitor spending for MTSU, presented in columns four through seven of Table 3. It is estimated that visitors to MTSU spent about \$16 million during the fiscal year 2003.

Table 3. Estimated Visitor Spending

<i>Events</i>	Average ON Spending	Average LDT Spending	Average NLDT Spending	Total ON Spending	Total LDU Spending	Total NLDU Spending	Total Visitor Spending
Motel, hotel , cabin or B&B	\$55.00	\$0.00	\$0.00	\$7,372,026	\$0	\$0	\$7,372,026
Restaurants & bars	\$23.22	\$4.39	\$14.34	\$3,111,715	\$116,755	\$638,738	\$3,867,207
Groceries, take-out food/drinks	\$4.07	\$1.50	\$5.85	\$545,832	\$39,966	\$260,704	\$846,502
Gas & oil	\$9.49	\$2.62	\$9.43	\$1,272,621	\$69,673	\$419,873	\$1,762,168
Clothing	\$6.00	\$0.91	\$1.33	\$803,630	\$24,088	\$59,337	\$887,055
Sporting goods	\$0.70	\$0.70	\$0.65	\$93,605	\$18,567	\$28,924	\$141,096
Souvenirs and other expenses	\$8.56	\$2.90	\$3.86	\$1,147,339	\$77,115	\$171,730	\$1,396,185
Total	\$107.04	\$13.02	\$35.46	\$14,346,768	\$346,163	\$1,579,307	\$16,272,239

Notes : ON = overnight visitors; NLDT = non-local day-trippers; LDT = local day- trippers

³ The Great Smokey Mountain Visitor Expenditure Survey at <http://data2.itc.nps.gov/parks/grsm/ppdocuments/1996GRSMvisitorstudy.pdf>

⁴ One of the local area hotel managers indicated that livestock events are the main source of customers each year.

V. Impact on the Nashville MSA

Table 4 presents a summary of the economic impact of MTSU on the Nashville MSA by expenditure category. Our estimates indicate that for fiscal year 2003, MTSU spent about \$100 million for goods and services in the local economy.

The total impact of MTSU operating expenditures is

- ✓ \$152 million in output (business revenue),
- ✓ \$58 million in personal income, and
- ✓ 1,453 jobs.

MTSU employed 1,903 people, accounting for \$80.7 million after-tax, commuter-adjusted household income. Employment comprises 825 faculty, 470 staff, and 608 clerical and support staff.

The impact of MTSU payroll on the Nashville MSA economy is

- ✓ \$153 million in business revenues,
- ✓ \$137.4 million in personal income, and
- ✓ 1,558 jobs (excluding 1,903 MTSU jobs).

In the 2002-03 academic year, student enrollment was 21,744 (18,735 FTE). As we estimated earlier, the direct student expenditure (excluding tuition and fees) in the region was \$182.4 million.

The total economic impact of MTSU students' expenditure is

- ✓ \$338.7 million in business revenues,
- ✓ \$132.3 million in personal income, and
- ✓ 3,769 jobs.

As noted above, MTSU attracts a significant number of visitors each year. For fiscal year 2003, we estimated that visitors spent \$16.3 million in the area.

The total economic impact of visitor spending is

- ✓ \$36.2 million in business revenues,
- ✓ \$15.2 million in personal income, and
- ✓ 493 jobs.

In summary, our analysis indicates that MTSU was responsible for

- ✓ 9,176 jobs in the Nashville MSA,
- ✓ more than \$680 million (direct, indirect, and induced) in business revenues, and
- ✓ \$343 million in personal income.

This total impact represents the direct, indirect, and induced impacts of MTSU's different activities (Table 4). These results mean that if MTSU were not located within the Nashville MSA, total business revenue would decrease by about \$680 million, and employment would be 9,200 smaller.

Table 4: Economic Impact of Middle Tennessee State University
(Nashville MSA)

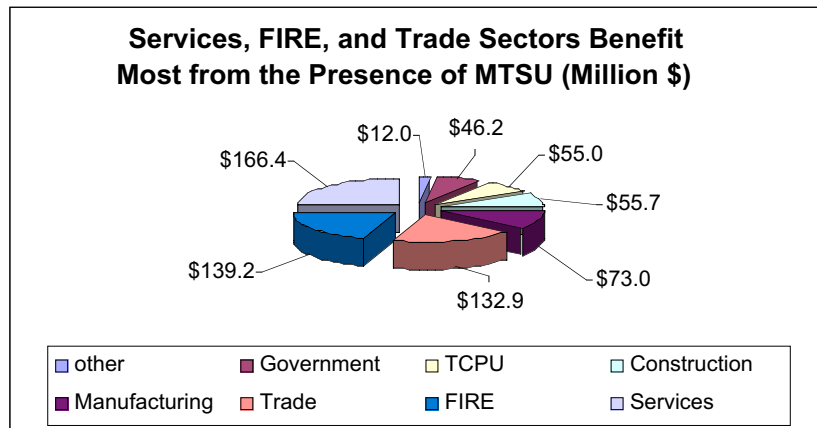
Expenditure Categories	Total Business Revenue (Million)	Total Employment (FTE)	Total Personal Income (Million)
University Operation	\$152.2	1,453	\$57.6
University Employees	\$153.3	3,461	\$137.4
Visitor Expenditure	\$36.2	493	\$15.2
Student Expenditure	\$338.7	3,769	\$132.3
Total Impact	\$680.4	9,176	\$342.5

Note: MTSU full time employment for the 2002-2003 academic year is 1,903

VI. Impact by Industry for the Nashville MSA

Figures 3 and 4 present a summary of the sectors of the Nashville MSA economy that are impacted by the myriad of activities that occur in the greater Nashville area because of MTSU's presence. Figure 3 indicates that the presence of MTSU increases service sector business revenue by \$166 million, about 24 percent of the \$680 million total business revenue impact. The finance, insurance, and real estate sector is the next, with an impact of about \$139 million in business revenues, representing 20 percent of total business revenues impacted by MTSU. Other affected sectors include trade, manufacturing, and construction among others.

Figure 3. MSA Sector Business Revenue Attributed to MTSU's Presence



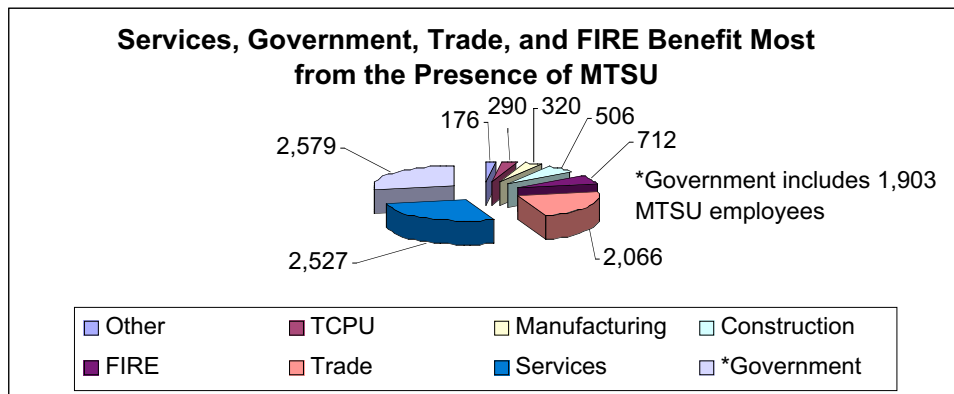
Notes: The "Other" sector includes agriculture, mining, institutional transfers, scrap, used and secondhand goods, etc. TCPU refers to Transportation, Communications, and Public Utilities. FIRE refers to Finance, Insurance and Real Estate

As for the impact on jobs, since MTSU is included in the public sector, the impact on the government sector is largest, about 2,579 jobs. The largest of the remaining impacts occur in the services sector (2,527 jobs) and trade (2,066 jobs). Smaller job impacts occur in manufacturing, construction, finance, insurance, and real estate.

VII. Fiscal Impact for the Nashville MSA

How much tax revenue is generated by MTSU activities? Our analysis indicates that the presence of MTSU improves government finances in the region. Table 5 presents the impact of MTSU activities on state and local tax revenues. The results indicate that the estimated local and state taxes generated by MTSU's activities amounted to about \$46 million.

Figure 4. MSA Sector Employment Attributed to MTSU's Presence



Notes: The "Other" sector includes agriculture, mining, institutional transfers, scrap, used and secondhand goods, etc. TCPU refers to Transportation, Communications, and Public Utilities. FIRE refers to Finance, Insurance and Real Estate.

Table 5: MTSU Fiscal Impact on Nashville MSA

Tax Source	Taxes (Million \$)
Total Direct Local and State Sales Taxes	\$17.5
Total indirect Local and State Taxes	\$28.4
Total State/Local Government Tax	\$45.9

VIII. Impact on Rutherford County

MTSU is a major generator of jobs, income, and business revenue for Rutherford County. Table 6 presents MTSU's economic impact on Rutherford County. The results indicate that for fiscal year 2003 MTSU contributed about \$259 million in business

revenues, 5,200 jobs, and \$90 million in labor income to the Rutherford County economy.

Table 6: Economic Impact of Middle Tennessee State University on Rutherford County

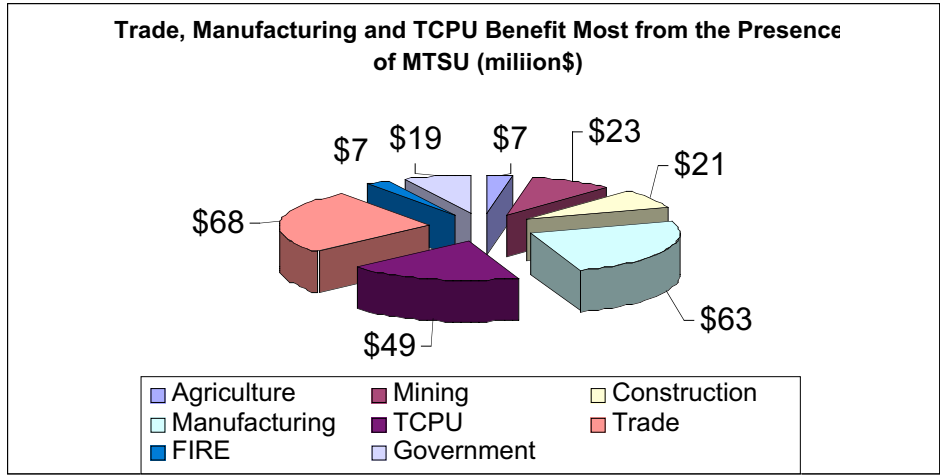
Expenditure Categories	Total Business Revenue (Million)	Total Employment (FTE)	Total Personal Income (Million)
University Operation	\$50.8	519	\$18.7
University Employees	\$77.5	2,639	\$20.5
Visitor Expenditure	\$21.5	392	\$8.1
Student Expenditure	\$109.2	1,618	\$41.7
Total Impact	\$259.0	5,168	\$89.0

Note: MTSU full time employment for the 2002-2003 academic year is 1,903

The total impact is the direct, indirect, and induced impacts of selected MTSU activities on Rutherford County’s economy. This result means that if MTSU were not located within Rutherford County, total business revenue would be \$259 million lower, employment lower by 5,168 jobs, and personal income \$89 million lower.

The largest business revenue impact is in the trade (\$68 million) and manufacturing (\$63 million), while other sectors include transportation, communications, and public utilities (TCPU) (\$49 million), mining (\$23 million), and construction (\$21 million) among others (Figure 5).

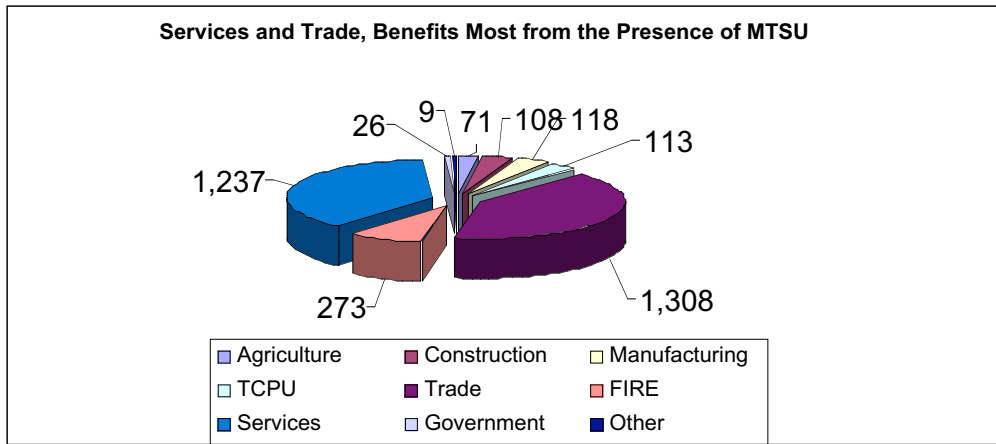
Figure 5: Rutherford Sector Business Revenue Attributed to MTSU's Presence



Note: The "Other" sector includes agriculture, mining, institutional transfers, scrap, used and secondhand goods, etc. TCPU refers to Transportation, Communications, and Public Utilities. FIRE refers to Finance, Insurance and Real Estate.

As for employment, the trade sector enjoyed the largest impact of MTSU's activities. Employment in this sector attributable to the presence of MTSU in Rutherford County is 1,308 jobs. The service sector is the second with 1,237 jobs, followed by TCPU, manufacturing, and construction (Figure 6).

Figure 6: Rutherford Sector Employment Attributed to MTSU's Presence



Note: The "Other" sector includes agriculture, mining, institutional transfers, scrap, used and secondhand goods, etc. TCPU refers to Transportation, Communications, and Public Utilities. FIRE refers to Finance, Insurance and Real Estate

IX. Fiscal Impact in Rutherford County

Table 7 indicates that the estimated local and state taxes generated by MTSU's activities amounted to about \$24 million in Rutherford County. Thus, if MTSU were not present in this area, the local and state government would have lost an amount close to \$24 million in tax revenues.

Table 7: MTSU Fiscal Impact on Rutherford County

Tax Source	Taxes (Million \$)
Total Direct Local and State Sales Taxes	\$12.2
Total Indirect Local and State Taxes	\$12.6
Total State/Local Government Tax	\$24.8

These are economic impacts of activities we can estimate. However, we must acknowledge that the economic impact of activities that we did not measure is far greater than what we estimated above. What is the significance of those activities?⁵

X. Other MTSU Functions that Generate Socioeconomic Impact

a. Human Capital Creation

With its first-rate educational programs and increasing synergy between local businesses and the university, MTSU has been an important source of economic dynamism in the region. A phenomenal growth in its enrollment over the past decade attests that MTSU has been creating a learning environment that is high quality, affordable, and accessible to area as well as out-of-state residents. In the 2002-03 academic year, 3,361 students graduated from MTSU, and 91 percent of them chose Tennessee and 60 percent the Nashville MSA as a place of work. The university is a

⁵ For a comprehensive survey of universities' benefits to the community, local and state government, businesses, and individuals, see Fred Carstensen, Stan McMillen, and Murat Arik, 2003, *The Economic Impact of Continuing Operations of the University of Connecticut*, Connecticut Center for Economic Analysis, Storrs, CT at http://ceea.uconn.edu/ceea_studies.htm.

major source of the region's skilled workforce, and this in turn attracts many businesses to the area.

Technological advances and increasing global competitiveness create pressure for continuous skill upgrades for the area workforce. To accomplish this, workers are required to go through a continuing learning process. MTSU plays a crucial role in the region, offering lifelong learning and professional development courses through its Continuing Education and Public Service department. In the 2002-03 academic year, 5,879 people enrolled for lifelong learning courses, and enrollment has been increasing since 1997. Benefits from these courses are significant for both businesses and individuals.

b. MTSU, Community, and Quality of Life

The presence of a university in a community improves the local quality of life in many respects. The quality public services provided by a university at no or low cost are instrumental in improving quality of life. Faculty and staff research, educational opportunities, cultural activities, and university facilities (i.e., library, recreation center) are some examples that attract businesses and people to the area.

Furthermore, university students are important sources of labor for part- or full-time openings. These students are an addition to the local population, adding to the local consumer base and in turn attracting new businesses.

Finally, because of their earnings, university employees improve the local tax base and provide stability in local government finances. Considering these secondary effects on the economy, MTSU is an important part of regional economic life.

IX. Conclusion: MTSU and Economic Dynamism

MTSU is a significant economic driver in the local economy, creating dynamism for further economic growth, meanwhile providing stability for government finances.

Looking back, history witnesses phenomenal growth both in MTSU enrollment and activities in Rutherford County.

Between 1985 and 2000:

- MTSU enrollment increased by 69 percent from 11,293 to 19,121. Excluding MTSU, enrollment increase in four-year Tennessee public higher institutions was 8 percent.
- Rutherford County population increased by 87 percent, primarily through net migration, while Tennessee's and the nation's population increased by 21 percent and 17 percent, respectively.
- Total payroll employment more than doubled by a 119 percent increase. Payroll employment for Tennessee and the nation grew 45 percent and 35 percent, respectively.
- Between 1993 and 2000, the number of business establishments in Rutherford County grew about 31 percent while the number of business establishments in Tennessee grew 9.7 percent.

We must also acknowledge MTSU's contribution to economic and social development.

MTSU has contributed to the local economy by:

- generating knowledge (i.e., applied research),
- supplying a skilled labor force (i.e., MTSU graduates and students),
- increasing both worker and business productivity (i.e., lifelong learning and professional development),
- increasing quality of life in the region (i.e., public services, cultural events),
- attracting visitors and retaining university retirees (i.e., athletic and other events),
- increasing government's local tax base,
- providing stability to the local economy, and
- increasing the visibility of the community through athletic and cultural events.

Appendix 1: Estimated Fiscal Impacts

The procedure we used to calculate fiscal impacts of the selected MTSU activities is as follows. First, we obtained an estimate of business-to-business taxes from IMPLAN to capture the sales tax that indirect and induced spending generates in the region. Second, we calculated out of model sales taxes generated by MTSU employee household spending, visitor spending and student expenditures.

For household spending, we used information from the consumer expenditure survey data for southern region. We then recalculated share of each taxable expenditure categories in total household expenditure. According to the Consumer Expenditure Survey, households in southern states spend about 81 per cent of their total household income for goods and services, of which about 59 percent constitutes taxable expenditure categories. That is, households spend about 48 percent of their total household income for taxable goods and services. In calculating fiscal impact of MTSU, we utilized these figures for southern states and came up with about \$48 million taxable direct household spending due to MTSU employees (See Table 8 below). To simplify the sales tax calculation process, we applied a 10 percent flat sales tax on spending in each category. We, however, acknowledge that there is a variation in state and local tax rates by region and expenditure category.

Table A.1 Average Household Spending Categories Subjected Sales Tax

Expenditure Category	Share in Total Expenditure	MTSU Household Income (After Tax) **
Food	0.24	\$11,444,739
Household operations	0.03	\$1,462,123
Personal services	0.01	\$665,210
Other household expenses	0.02	\$796,913
Housekeeping supplies	0.02	\$1,098,266
Laundry and cleaning supplies	0.01	\$308,050
Other household products	0.01	\$544,669
Postage and stationery	0.01	\$243,315
Household furnishings and equipment	0.06	\$2,957,729
Transportation	0.34	\$16,563,285
Health care	0.11	\$5,165,423
Entertainment	0.08	\$3,745,713
Apparel and services	0.07	\$3,564,901

Source: Bureau of Labor Statistics: Consumer Expenditure Survey at www.bls.gov/cex/home.html

** MTSU total payroll is \$100,948,724.09. After federal taxes and FICA, disposable personal income is estimated around \$80,664,537

For the visitor and student expenditures, we followed the same logic and estimated sales and local taxes, again using a flat tax rate of 10 percent.

Appendix 2: Calculation of Hotel Nights

Visitors to Livestock Centers

For the 2003 fiscal year, the two livestock centers operated by MTSU hosted more than 60 events. In calculating the hotel nights for these events, we divided them into international/national events, mixed location events (local and national), and local events.

We assumed that of the visitors who attended international/national events at the center, 15 percent were local day visitors, 25 percent non-local day visitors, and 60 percent non-local overnight visitors. In the case of mixed events, we assumed that the visitors consisted of 25 percent local day visitors, 25 percent non-local day visitors, and 50 percent non-local overnight visitors. For events designated as local events, we assumed that 70 percent of the participants were local day visitors whereas 30 percent were non-local day visitors. Additionally, we assumed that 1.5 overnight visitors occupied each room. Since we know the duration of each event, there was no need to make assumptions for the length of stay.

To calculate the number of hotel nights, we divided the number of overnight visitors for each event by our assumed average room occupancy (1.5 persons per room) and then multiplied by the duration of the event. Using this method, the totals for livestock events for 2003 were 57,448 hotel nights, 14,018 local day visitors, and 15,584 non-local day-trippers.

TSSAA Events

TSSAA events held at MTSU for 2003 included boys and girls basketball, girls volleyball, and football tournaments. The figures for these events come from data collected for an impact study for TSSAA events by the BERC.⁶ This study estimated that a total of 95,471 people attended these sports competitions in 2003. The study also estimated that 96 percent of basketball attendees, 86 percent of volleyball attendees, and 98 percent of football attendees come from outside the area.

Based on the BERC TSSAA study, we estimated that, on average, overnight attendees to these events stayed in the area for 1.5 days with an average of 2.1 persons occupying each room, generating 56,301 hotel nights along with 5,069 local and 18,952 non-local day trippers.

MTSU Athletics

The Middle Tennessee Athletics Department has 10 intercollegiate sports that attract visitors and other teams from other areas. Note that, in calculating hotel nights attributed to MTSU sports, only guest teams to home games and their supporters are

⁶ “Impact of Tennessee Secondary School Athletic Association Events on the Economy of Rutherford County, Tennessee.” MTSU Business and Economic Research Center (BERC), January 2002.

considered. The sports considered by this study and the number of home games they played in the 2002-03 academic year are presented in Table 9.

Table 9: MTSU Sports and Home Games

Sport	Home Games
Men Basketball	11
Women Basketball	13
Baseball	13
Softball	6
Men Tennis	11
Women Tennis	7
Football	6
Volleyball	4
Total	71

Using information from ticket sales to supporters of visiting teams and information from MTSU coaches and Murphy Center staff, we estimated the number of visiting team members and supporters and the nights they stayed in this area. From these estimates, we estimated total visitors per game. Then using 2.1 as the average hotel room occupancy, we calculated hotel nights by dividing total visitors per night by 2.1. The total of hotel nights for MTSU sports teams is 7,788 nights.

MTSU Parking

The MTSU Parking and Transportation Services issued 25,000 visitors' parking passes for the 2002-03 fiscal year. We assumed that local and non-local day visitors each accounted for 30 percent of the total visitors obtaining parking permits, and overnight visitors made up the remaining 40 percent. We assumed further that overnight visitors stayed in the area for 2.5 days on average. Using an average room occupancy rate of 1.5 persons per room, we attributed 12,500 hotel nights, 7,500 local, and 10,000 non-local day visitors for the year 2003 to permit-obtaining visitors to MTSU.

Table 10. Hotel Nights and Day Trips

Events	Hotel Nights	Day-Trippers	
		Local	Non-Local
Livestock Center Events			
National/International Events	49,840	6,000	10,000
Mixed Events	7,608	3,759	3,759
Local events	0	4,259	1,825
TSSAA Events	56,301	5,069	18,952
MTSU Sports Events	7,788		
Visitor Parking Trips	12,500	7,500	10,000
Total	134,037	26,587	44,535

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