The Economic Impact of Lincoln Memorial University on the State & Regional Economies

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The Economic Impact of Lincoln Memorial University on the State and Regional Economies

EXECUTIVE SUMMARY

Everyone is aware that Lincoln Memorial University (LMU) provides an outstanding quality educational program to its students. However, many are not aware of the huge economic contributions that LMU makes to the State of Tennessee and to its primary impact region. The objective of this study was to measure the economic contributions that LMU provides to the state and region. The economic contributions are measured in employment, income (wages, salaries, and benefits) and retail sales.

The University creates economic impact from four different activities. These include activities from (1) operations, (2) construction projects, (3) student non-university spending, and (4) visitor spending. The annual operations of the University involve the number of employees and the resulting wages, salaries, and benefits paid. In FY 2007, the University had 437 full- and part-time employees and a payroll of $17.9 million.

Construction activities occur only the year the construction occurs. In FY 2007, the University had over $27.3 million in construction projects. This generates 298 full and part-time jobs and $11.8 million in payroll.

Students spend money off campus for such items as housing, food, gasoline, entertainment, etc. It is estimated that students spend annually $24.1 million. This creates 229 full or part-time jobs and $9.4 million in payroll. Finally, visitors come to the campus and spend money in the region while visiting the campus. This was estimated at $5.6 million in FY 2007. These expenditures created 91 full and part-time jobs with a payroll of over $1.9 million.

Using a computer program developed specifically to measure the economic impact of the university, the study not only measured the direct economic contribution of the activities of the

University, but also calculated how many jobs and how much income were created in other businesses due to all of the activities of the University. The model was able to measure the economic impact of LMU on the State of Tennessee as well as in its primary impact region. The impact results for the state are presented in **Executive Table 1**.

University operations create 437 full and part-time jobs. This activity has an employment multiplier of 1.61 which means that for every job created by University operations, another .61 job is created in other businesses due to the University and the University's employees spending money. The total impact of the University operations was 704 jobs in FY 2007.

Likewise, the model can measure the economic impact of income (wages, salaries and benefits) on the economy. LMU paid $17.9 million in payroll in FY 2007. The income multiplier is 1.54 which means that for every $1 of income paid by LMU, another $0.54 of income is generated in other businesses. Thus, the total income impact of LMU's payroll was over $27.6 million. The model also estimates retail sales and sales taxes generated from this income. From the University operating activities, approximately $8.6 million in retail sales was estimated and almost $600,000 in state sales taxes collections.

When all of the activities were included, the total impact of LMU on the state's economy was 1,772 full and part-time jobs, $68.2 million in income (wages, salaries and benefits,) $21.2 million in retail sales and $1.5 million in sales tax collections.

The model was also applied to what was identified as the primary impact region. This included three counties in Virginia, ten counties in Kentucky and 14 counties in Tennessee. The economic impact in the region was slightly less than the state impact. The bottom line is that LMU contributes greatly to the economies of the State of Tennessee and to its primary impact region. LMU is extremely important for educational reasons as well as economic reasons.

Executive Table 1
Annual Economic Impact of Lincoln Memorial University on the State of Tennessee, FY2007

Sector	Employment			Income			Sales Tax	
	Direct	Multiplier	Total Impact	Direct	Multiplier	Total Impact	Retail Sales	7 Cent Tax
University	437	1.61	704	$17,917,471	1.54	$27,592,905	$8,570,356	$599,925
Construction	298	1.72	513	$11,766,664	1.70	$20,003,329	$6,213,034	$434,912
Student Spending[1]	229	1.85	424	$9,383,928	1.83	$17,172,588	$5,333,806	$373,366
Visitor Spending	91	1.44	131	$1,950,172	1.76	$3,432,303	$1,066,073	$74,625
TOTAL	**1,055**		**1,772**	**$41,018,235**		**$68,201,125**	**$21,183,269**	**$1,482,828**

[1]Total expenditures include non-university spending only. Revenue from campus spending such as tuition, campus housing costs and books purchased at the campus bookstore are captured in LMU auxiliary revenue.

Source: Employment, spending and income data from LMU; Multipliers and coefficients from 2006 IMPLAN Data, Minnesota Implan Group Inc., Retail Sales data from Tennessee Department of Revenue, U.S. Department of Commerce Bureau of Economic Analysis.

The Economic Impact of Lincoln Memorial University on the State and Regional Economies

INTRODUCTION

Colleges and universities are many things to many people. Viewed through the lens of economics, however, they are key to the viability of local, state, regional and national economies. From this perspective, they are sources of jobs and income to their employees and students. They are also large consumers which create additional jobs and income to suppliers of materials, services, equipment and capital structures. They provide entertainment and cultural opportunities. They produce skilled labor, enhance the lifetime income of graduates and increase the productive capacity of the economy. They contribute to the fund of knowledge to the economy through extension and technology transfer activities. They also spin off and attract research and industrial enterprises (**Appendix A.**)

The objective of this study is to estimate the economic impact that Lincoln Memorial University (LMU) has on the economy. More specifically, the report will:

1. Present financial, student and other data reflecting LMU activities,
2. Measure the following economic impacts that LMU operation and construction activities as well as student and visitor spending had on the State of Tennessee economy through increased;
    - employment
    - wages, salaries and benefits
    - retail sales
3. Measure the following economic impacts that LMU operation and construction activities, as well as student and visitor spending had on the primary economic

impact region including parts of Tennessee, Kentucky and Virginia through increased;

- employment
- wages, salaries and benefits
- retail sales

RESEARCH METHODOLOGY

This report focuses primarily on the impacts on jobs and income (wages, salaries and benefits) created on an annual basis by the entire LMU system, its employees, its students, and its visitors to the campuses. A review of previous literature relative to impact studies is given in **Appendix A**. Data for this study are from FY 2006 - 2007. These impacts are concentrated on the local community, but also spill over to the surrounding counties and to the state. Much of the revenue is used to hire faculty, staff and maintenance employees. Most of the income provided directly through these jobs is spent and re-spent, creating additional jobs and income. As a result, the total number of jobs and the total income attributable to LMU are larger than the number of jobs and wages and salaries from the system itself. The revenue that is not used to hire employees is used to procure various goods and services. The businesses use this revenue to hire employees, pay salaries and purchase materials. This additional economic activity is called the multiplier effect.

To calculate the economic impacts noted above, a widely-accepted input-output model and data from IMPLAN were utilized to estimate the direct, secondary, and total impacts of LMU on the economy of the State of Tennessee and a primary impact region including parts of Tennessee, Kentucky and Virginia. The economic impact in this report

will be quantified as total employment including direct, secondary and total jobs and the associated wages, salaries and benefits. Detailed information on the model used in this report can be found in **Appendix B**. This study is directed by Dr. Gerald A. Doeksen, a renowned economist from Oklahoma State University, who is widely recognized for his research regarding economic impact studies of universities, health systems and industrial changes (**Appendix C**)

OVERVIEW OF LINCOLN MEMORIAL UNIVERSITY

Lincoln Memorial University (LMU) was chartered by the State of Tennessee on February 12, 1897, as a commitment to Abraham Lincoln's 1863 request to organize a university for the people of this area. The main campus, located on 1,000 wooded acres in Harrogate Tennessee, has 33 academic, administrative, and residential buildings. The current total enrollment including 11 extended sites in the surrounding area is over 2,700 undergraduate and graduate students. In addition, LMU recently completed construction of the new LMU DeBusk College of Osteopathic Medicine and its first class of 150 medical students started in August 2007. Today, LMU continues the mission of providing educational opportunities, developing community leadership and expanding economic and social forces within its region. By making educational and research opportunities available to students where they live and through various recreational and cultural events open to the community, LMU seeks to advance life in the Cumberland Gap area and throughout the region through its teaching, research, and service mission.

University Revenues

LMU finances its day-to-day operations with revenues derived from a variety of sources. In Fiscal Year 2007, the system's income exceeded $37.6 million. Total

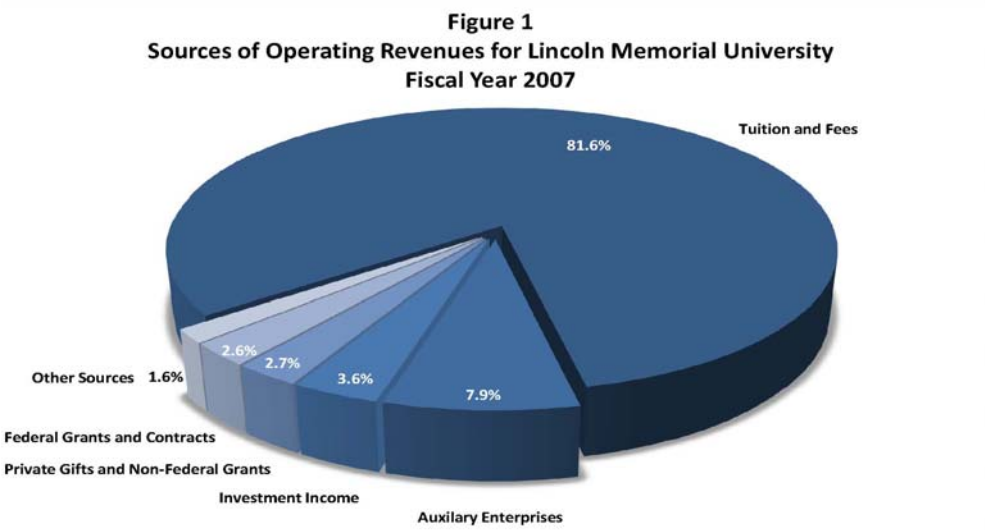
revenues for LMU by major funding source are shown in **Table 1**. LMU is a private university and therefore 81.6 percent ($30.8 million) of the total revenues came from tuition and fees (**Figure 1.**) Student fees include registration, information technology,

Table 1
Sources of Operating Revenues for Lincoln Memorial University, FY 2007[1]

Source	Revenue	Percent
Tuition and Fees	$30,768,711	81.6
Auxiliary Enterprises	$2,977,629	7.9
Investment Income	$1,338,361	3.6
Private Gifts and Non-Federal Grants	$1,036,421	2.7
Federal Grants and Contracts	$974,721	2.6
Other Sources	$597,272	1.6
TOTAL Operating Revenue	**$37,693,115**	**100.0**

[1]Operating revenue does not include $2,115,954 special purpose funds from private gifts that will be spent in future years as projects are approved.

Source: LMU financial reports



student activities, etc. The largest of the other sources was almost $3 million from the auxiliary enterprises operated by the University such as dormitories, cafeteria and bookstore. Approximately $1.3 million are derived from interest and dividend income from investments. The remaining $2.6 million comes from grants, both federal and non-federal, private gifts and miscellaneous sources.

University Expenditures

Total expenditures for LMU by major funding use are given in **Table 2.** Just over $11.8 million were spent in FY 2007 for instruction and research. A major part of these two fund uses was wages, salaries and benefits to faculty and professional staff.

Table 2
Total Expenditures by Funding Use for Lincoln Memorial University, FY 2007

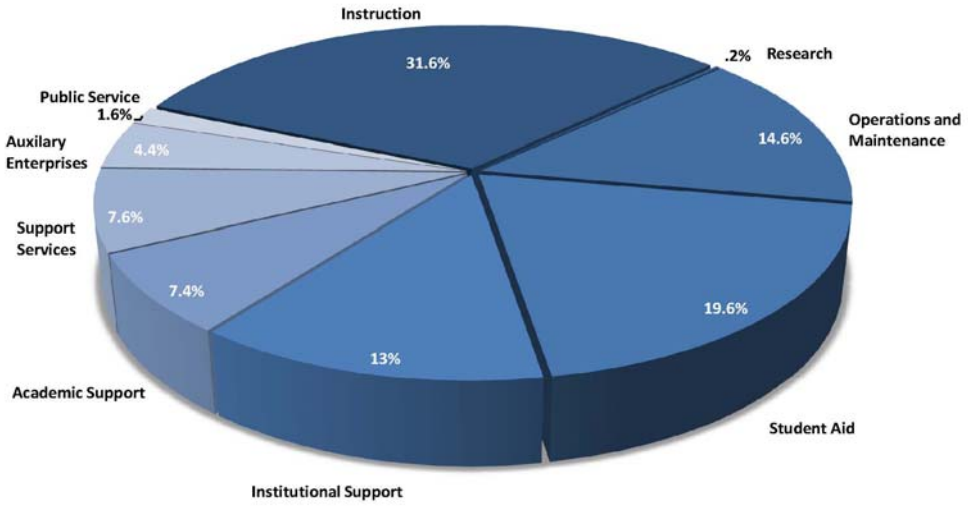
Funding Use	Expenditures	Percent
Instruction	$11,765,098	31.6
Research	$70,136	0.2
Operations and Maintenance	$5,449,150	14.6
Student Aid	$7,312,921	19.6
Institutional Support	$4,837,176	13.0
Academic Support	$2,759,075	7.4
Support Services	$2,851,007	7.6
Auxiliary Enterprises	$1,645,912	4.4
Public Service	$595,184	1.6
TOTAL Expenditures	**$37,285,659**	**100.0**

Source: LMU financial reports

Approximately, $7.3 million was given to the students for assistance and $5.4 million was spent for operation and maintenance. Expenditures for LMU totaled over $37 million.

The pie chart in **Figure 2** illustrates the proportions of university expenditures by funding use. Instruction is the largest category utilizing 31.6 percent of total expenditures. Combined expenditures for academic support, institutional support and support services totaled 28.0 percent. Student aid expenditures including scholarships, and federal and state assistance was the second largest single funding use with almost 20 percent of the funds going toward student financial assistance. Nearly 65 percent of LMU students received some type of financial assistance. Another 14.6 percent of total expenditures were spent on operations and maintenance. LMU is a liberal arts college and although it offers research opportunities, the percent of funds going toward research (0.2) is relatively small as compared to research based universities.

Figure 2
Total Expenditures by Funding Use for Lincoln Memorial University
Fiscal Year 2007



Another way of analyzing university expenditures is by major spending category or total operating expenditures as shown in **Table 3**. Restricted funds are not included in total operating funds resulting in a slightly smaller total of $34 million. More than half of the total operating expenses or $17.9 million went toward employee wages, salaries and benefits.

Table 3
Total Expenditures by Category for Lincoln Memorial University, FY 2007

Fund Category	Expenditures	Percent
Employee Expenses		
Wages and Salaries	$13,913,604	40.7
Student Wages	$191,166	0.5
Related Expenses	$3,812,701	11.2
Total Wages, Salaries and Benefits	**$17,917,471**	**52.4**
Student Support	$6,564,329	19.2
Supplies and Printing	$919,319	2.7
Travel	$788,699	2.3
Utilities	$923,875	2.7
Communication	$329,974	1.0
Advertising	$417,781	1.2
Equipment	$819,451	2.4
Insurance	$608,443	1.8
Food Service	$1,250,317	3.7
Other	$3,613,221	10.6
TOTAL Expenditures	**$34,152,880**	**100.0**

Source: LMU financial reports

LMU paid $6.5 million of their unrestricted funds for additional student support. Food service costs were $1.2 million. The cost of utilities was another major expense, and last year LMU spent over $923,000. Typical operations require continuous purchasing of equipment. LMU spent $819,000 on equipment in FY 2007. These expenses illustrate the demand for various services in the community and surrounding region which stimulate additional economic activity.

University Employment and Salaries

Employee expenses are detailed below in **Table 4**. There were 104 full-time and 59 part-time faculty and other professionals on the payroll in FY 2007. Wages, salaries and benefits for professionals totaled $7.3 million. In addition there were 232 full and part-time staff and 42 students working for LMU during the last fiscal year. Total employee expenses for all LMU staff were $17,917,471

Table 4
Number of Faculty, Staff and Student Employees
Lincoln Memorial University, FY 2007

Category	Full-time	Part-time	Wages Salaries Benefits
Professional	104	59	$7,306,181
Staff	208	24	$10,420,124
Student	0	42	$191,166
TOTAL Employment	**312**	**125**	**$17,917,471**

Source: LMU Academic Affairs

University Construction Expenditures

Construction was another important activity for LMU especially during FY 2007 when construction was completed on the new Lincoln Memorial-DeBusk College of Osteopathic Medicine. Approximately, $30.5 million were spent on new construction and building improvements in the last two fiscal years (**Table 5.**) Construction operations impact the local community and surrounding region as contractors purchase building material and employ construction workers, many of whom travel from other towns and spend part of their wages on food, drink and lodging.

Table 5
Total Construction Expenditures for Lincoln Memorial University, FY 2006 and 2007

Year	Dollars
Fiscal Year 2006	$3,180,223
Fiscal Year 2007	$27,364,335
TOTAL Construction Expenditures	**$30,544,558**

Source: LMU financial reports

Student Enrollment and Non-university Spending

During the 2006-2007 academic school year, total student enrollment ranged from 2,981 in the fall to 2,758 in the spring semester. An estimated 1,494 students attended classes during the 2007 summer session. Slightly more than 50 percent of the total students enrolled in the Fall and Spring semesters are graduate professional students. A detailed listing by class of all the students attending LMU is given in **Table 6**.

Student spending can be a challenge to estimate due to the wide-range of spending patterns, number of commuter students and the varied student traffic associated

with 11 extended campus sites. Estimated total student spending is provided in **Table 7**. These costs represent only the non-university portion of student spending by full-time students. Tuition, fees, campus housing costs and a large portion of book purchases are paid directly to the university and will be captured through university revenues. This method was believed to best approximate student expenditures.

Table 6
Total Student Enrollment for Lincoln Memorial University
for School Year 2006-2007

Student Category	Fall 2006	Spring 2007	Summer 2007
Undergraduate			
Freshman	395	298	
Sophomore	312	289	
Junior	310	339	
Senior	309	330	
Unclassified	68	60	
TOTAL Undergraduate	1,394	1,316	176
TOTAL Graduate Professional	1,587	1,442	1,318
TOTAL Student Enrollment	**2,981**	**2,758**	**1,494**
TOTAL Full-Time Enrollment	**1,310**	**2,068**	**1,048**

Source: LMU enrollment statistics

Even though this method underestimates total student spending by the daily amount spent by part-time commuters, it also tends to overestimate spending by including some full-time students that commute. It was estimated that the 1,310 fall semester, full-time students spent almost $7.8 million and the 2,068 students enrolled

full-time in the spring spent over $13 million. The students enrolled full-time in the summer spent over $3.0 million for a total of $24.1 million for FY 2007.

Table 7
Lincoln Memorial University Student Non-university Spending
for School Year 2006-2007[1]

Student Category	Fall 2006	Spring 2007	Summer 2007
Students Living in Campus Housing			
Full-time Students	375	375	0
Spending per Student	$2,793	$2,793	$1,128
Total Student Spending	$1,047,375	$1,047,375	$0
Students Living Off-Campus			
Full-time Students	935	1,693	1,048
Spending per Student	$7,205	$7,205	$2,893
Total Student Spending	$6,736,675	$12,198,065	$3,031,864
TOTAL Student Expenditures	**$7,784,050**	**$13,245,440**	**$3,031,864**

[1]Total expenditures include non-university spending only. Revenue from campus spending such as tuition, fees, campus housing costs and books purchased at the campus bookstore are captured in LMU auxiliary revenue.

Source: Based on proposed student budget available on LMU website, http://www.lmunet.edu

Visitor Days and Spending

A university attracts a large number of visitors each year for various events and activities. Parents bring their sons and daughters to enroll, help them with their living arrangements and attend some of their activities. Alumni revisit the campus for athletic events and to attend banquets and other special events. In addition, several visitors are brought to the campus by administrators and faculty to attend conferences and other

miscellaneous meetings. Each time a visitor comes to campus, they spend money at the local restaurants and often buy gas before they leave. Some of the activities require an overnight stay which generates revenue for the local motels. These are all local expenditures that occur due to the university's presence. Data in **Table 8** show that in FY 2007, the estimated 68,053 visitors to LMU spent almost $5.6 million while participating in on-campus activities.

Table 8
Estimated FY 2007 Expenditures from Visitors to Lincoln Memorial University

Visitor Category	Visitors	Daily Spending	Total Expenditures
Student Visitors and Parent Activities	7,204	$50	$360,200
Alumni and Athletic Activities	37,401	$100	$3,740,100
University Activities	22,668	$60	$1,360,080
Faculty and Staff Visitors	780	$143	$111,540
TOTAL Visitor Expenditures	**68,053**		**$5,571,920**

Source: Visitor days was obtained from LMU Enrollment Management and Student Services and estimated daily spending was based on University of Arizona research and estimates from LMU officials.

THE IMPACT OF LMU ON THE STATE OF TENNESSEE ECONOMY

As stated earlier, this report focuses on the economic impact as it relates to jobs and wages, salaries, and benefits resulting from activities associated with LMU. These activities are divided into the following categories:

1. Operation;
2. Construction;
3. Student Non-university Spending; and

4. Visitor Spending.

The previous section clearly documents that the direct activities of these categories are significant. However, this does not tell the complete story. Secondary economic impacts are created when LMU and its employees, construction firms and their employees, students, and visitors all spend money. These secondary benefits are measured by economic multipliers.

The Multiplier Effect

To further illustrate the multiplier effect, consider the opening of a new medical school. The medical school purchases goods and services from other businesses, and the dollars flowing to those businesses increase. Likewise, the medical school will hire employees who purchase goods and services locally. The purchases of the medical school and its employees will create additional jobs and wages and salaries throughout the local economy.

A multiplier from an input-output model such as IMPLAN can measure the effect created by an increase or decrease in economic activity. For example, an employment multiplier of 1.75 indicates that if one job is created by the medical school, then an additional 0.75 job is created in other businesses due to the medical school and employee spending. The model calculates employment and income multipliers.

Economic Impact from Operational Activities

The economic impact from activities related to operations is presented in **Table 9**. Employment (full and part time) and income (payroll including wages, salaries, and benefits) from operation activities were obtained from LMU. These activities occur every year. The University employed 437 full and part-time employees in FY 2007

(**Table 4.**) The higher education sector employment multiplier is 1.61. This means that for every job in the university, another 0.61 job is created in other business in the state. The secondary employment generated in the state from LMU is estimated at 267 jobs. The University had a total impact of 704 jobs in the State of Tennessee in FY 2007.

Data on the income from employees are also presented in **Table 9**. Data from LMU indicated that total income for the University is $17.9 million. Using the higher education sector income multiplier of 1.54, LMU generated secondary income of $9.7 million for a total of $27.6 million.

Table 9
Employment, Income and Retail Sales Impact of Lincoln Memorial University on the State of Tennessee from Operational Activities, FY 2007

Category		Amount
Employment Impact		
LMU Employment		437
Higher Ed. Sector Employment Multiplier	1.61	
Secondary Employment Impact		267
TOTAL Employment Impact		**704**
Income Impact		
LMU Income		$17,917,471
Higher Ed. Sector Income Multiplier	1.54	
Secondary Income Impact		$9,675,434
TOTAL Income Impact		**$27,592,905**
Retail Sales and Sales Tax Impact		
Retail Sales		$8,570,356
Sales Tax (7%)		$599,925

Source: Employment and income data from Lincoln Memorial University; 2006 IMPLAN Data, Minnesota Implan Group Inc., Retail Sales data from Tennessee Department of Revenue, U.S. Department of Commerce Bureau of Economic Analysis.

Income also has an impact on retail sales. The retail sales capture ratio can be used to estimate the impact of operational activities on retail sales. This ratio indicates the percent of personal income spent on items that generate sales tax. Data from the Tennessee Department of Revenue indicated that 31.06 percent of the income was spent in retail stores that collect state sales taxes. Thus it is estimated that $8.6 million were generated in retail sales from operations. Given the current 7.0 percent state sales tax rate in Tennessee, an estimated state sales tax collection of $599,925 occurred as a result of the retail sales from operational activities

Economic Impact from Construction Activities

LMU spends a significant amount on construction activities. This impact is often overlooked. It must be remembered that these impacts only occur during the year of construction and are not recurring. In FY 2006, LMU spent over $3.0 million on construction projects and in FY 2007 the amount increased to over $27 million (**Table 10**.) The construction of the new College of Medicine was the primary project.

Table 10
Employment and Income Generated from LMU Capital Investment Projects, FY 2006 and FY 2007

Year	Capital Investment	Full-time and Part-time Employees	Wages, Salaries and Benefits
FY 2006	$3,180,223	35	$1,367,496
FY 2007	$27,364,335	298	$11,766,664

Source: LMU, 2007, 2006 Implan Data, Minnesota Implan Group Inc.

From IMPLAN, the statewide ratios for employment and wages generated per million dollars of construction were used to estimate employment and income for each

fiscal year. In FY 2007, the capital investment of over $27 million was estimated to create 298 full and part time jobs and $11.8 million in wages, salaries and benefits.

The total employment impact from LMU construction activities is presented in **Table 11**. The construction employment multiplier of 1.72 indicates that another 0.72 job is created in other businesses in the state due to each construction activities. Those jobs in other businesses are referred to as secondary jobs. The estimated secondary employment impact for FY 2007 was 215 jobs, making the total employment impact of 513 jobs from construction activities.

Table 11
Employment Impact of LMU from Construction Activities, FY 2006 and FY 2007

Year	Direct Employment	Construction Employment Multiplier	Secondary Employment Impact	Total Employment Impact
FY 2006	35	1.72	25	60
FY 2007	298	1.72	215	513

Source: 2006 IMPLAN Data, Minnesota Implan Group Inc.

The impact on income is presented in **Table 12**. The construction income multiplier is 1.70, which means that for each dollar of wages and salaries paid to construction workers, another $0.70 of wages is generated in other businesses in the state. The secondary income for FY 2007 was $8.2 million and the total income from construction activities was $20 million. Retail sales are estimated at $6.2 million with 7.0 percent sales tax generating $434,912 from construction activities.

Table 12
Income, Retail Sales and Sales Tax Impact of Lincoln Memorial University on the State of Tennessee from Construction Spending, FY 2006 and FY 2007

Year	Direct Income	Construction Income Multiplier	Secondary Income Impact	Total Income Impact	Retail Sales	Sales Taxes
2006	$13,674,96	1.70	$957,247	$2,324,743	$722,065	$50,405
2007	$11,766,640	1.70	$8,236,665	$20,003,329	$6,213,034	$434,912

Source: Construction data from Lincoln Memorial University; 2006 IMPLAN Data, Minnesota Implan Group Inc., Retail Sales data from Tennessee Department of Revenue, U.S. Department of Commerce Bureau of Economic Analysis.

Economic Impact of Student Non-university Spending

When students attend classes at the university, they spend money for housing, food, entertainment, etc. The money they spend locally, outside of the university, stimulates additional economic activity that in turn generates jobs and income in other businesses. Student non-university expenditures were estimated in the previous section. Using ratios of expenditures to employment and income from IMPLAN, the employment and income generated from non-university spending were estimated. **Table 13** contains the estimates.

Jobs created from student spending were estimated at 229. The employment multiplier for retail trade and services was utilized to measure the multiplier impact. The employment multiplier for this sector was 1.85. Thus, 195 secondary jobs were created in other businesses and the total employment impact from student spending was 424 jobs

Income generated from student expenditures was estimated at $9.4 million. The income multiplier for retail trade and services was utilized to estimate the secondary income impact of $7.8 million. The total income impact from student non-university

spending was $17.2 million. This income generated $5.3 million in retail sales and $373,366 in state sales tax.

Table 13
Employment, Income and Retail Sales Impact of Lincoln Memorial University on the State of Tennessee from Student Spending, FY 2007

Category		Amount
Employment Impact		
Jobs from Student Spending		229
Retail Trade and Services Employment Multiplier	1.85	
Secondary Employment Impact		195
TOTAL Employment Impact		**424**
Income Impact		
Income from Student Spending		$9,383,928
Retail Trade and Services Income Multiplier	1.83	
Secondary Income Impact		$7,788,660
TOTAL Income Impact		**$17,172,588**
Retail Sales and Sales Tax Impact		
Retail Sales		$5,333,806
Sales Tax (7%)		$373,366

Source: Student spending data from Lincoln Memorial University; 2006 IMPLAN Data, Minnesota Implan Group Inc., Retail Sales data from Tennessee Department of Revenue, U.S. Department of Commerce Bureau of Economic Analysis.

Economic Impact from Visitor Spending

LMU activities attract many visitors to the campus. These visitors spend dollars that contribute to the local economy. Data in **Table 8** estimate that 68,053 visitors spent $5.6 million in FY 2007. These data were converted to jobs and income based on ratios of expenditures to jobs and income from IMPLAN. The impact of visitor spending is presented in **Table 14.**

Jobs created in businesses due to visitor spending were estimated at 91. The employment multiplier of 1.44 estimated that 40 secondary jobs were created. The total impact on employment was 131 jobs generated due to visitor spending at LMU.

Income generated from visitor spending was estimated at almost $2.0 million. The estimated secondary impact was $1.5 million using the retail trade and services sector income multiplier of 1.76. This yielded a total income impact from visitor spending of $3.4 million. This income resulted in retail sales of $1.1 million and state sales taxes of $74,625.

Table 14
Employment, Income and Retail Sales Impact of Lincoln Memorial University on the State of Tennessee from Visitor Spending, FY 2007

Category		Amount
Employment Impact		
Jobs from Visitor Spending		91
Retail Trade and Services Employment Multiplier	1.44	
Secondary Employment Impact		40
TOTAL Employment Impact		**131**
Income Impact		
Income from Visitor Spending		$1,950,172
Retail Trade and Services Income Multiplier	1.76	
Secondary Income Impact		$1,482,131
TOTAL Income Impact		**$3,432,303**
Retail Sales and Sales Tax Impact		
Retail Sales		$1,066,073
Sales Tax (7%)		$74,625

Source: Visitor data from Lincoln Memorial University; 2006 IMPLAN Data, Minnesota Implan Group Inc., Retail Sales data from Tennessee Department of Revenue, U.S. Department of Commerce Bureau of Economic Analysis.

Summary of LMU Impacts on the State of Tennessee Economy

In summary, LMU's total impact as it relates to jobs, income, retail sales and sales tax on the State of Tennessee economy is presented in **Table 15**. Total estimate for FY 2007 was 1,055 direct jobs. When including the secondary impacts, the total employment impact was 1,772 jobs. The direct income activities were estimated at over $41 million with the total income impact from LMU on the State of Tennessee of over $68.2 million. These dollars resulted in $21.2 million in retail sales and $1.5 million in state sales taxes.

THE IMPACT OF LMU ON THE PRIMARY IMPACT REGION

Lincoln Memorial University is located on the extreme northern border of Tennessee. Thus, it was decided to measure the economic impact of LMU on its primary impact region. Most of the economic impact will occur in this region (**Figure 3**.) The region consists of three counties in Virginia, ten counties in Kentucky, and 14 counties in Tennessee as identified by LMU officials.

The methodology presented in the previous selection was utilized to estimate the economic impact of LMU on the impact region. Again, the study analyzed the impact relative to four activities. These include the economic activity resulting from LMU:

1. Operations;
2. Construction;
3. Student Non-university Spending; and
4. Visitor Spending.

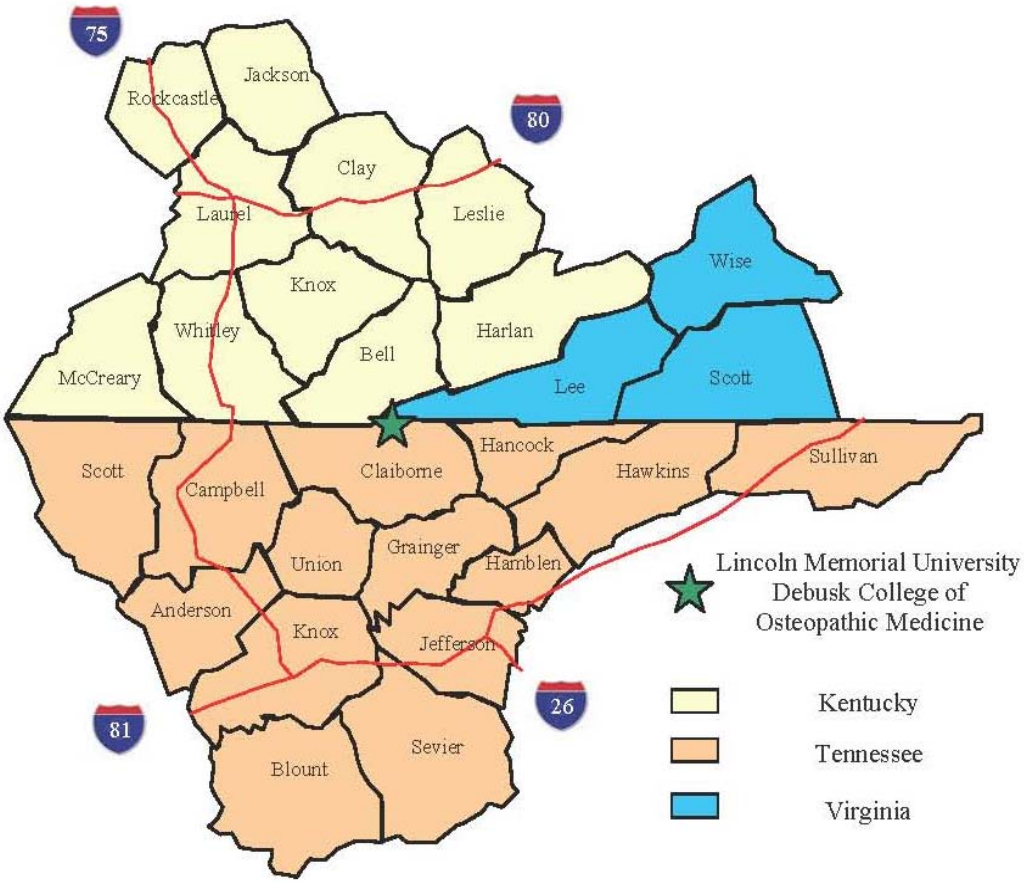
Table 15
Economic Impact of Lincoln Memorial University on the State of Tennessee, FY2007

Sector	Employment			Income			Sales Tax	
	Direct	Multiplier	Total Impact	Direct	Multiplier	Total Impact	Retail Sales	7 Cent Tax
University	437	1.61	704	$17,917,471	1.54	$27,592,905	$8,570,356	$599,925
Construction	298	1.72	513	$11,766,664	1.70	$20,003,329	$6,213,0034	$434,912
Student Spending[1]	229	1.85	424	$9,383,928	1.83	$17,172,588	$5,333,806	$373,366
Visitor Spending	91	1.44	131	$1,950,172	1.76	$3,432,303	$1,066,073	$74,625
TOTAL	**1,055**		**1,772**	**$41,018,2.5**		**$68,201,125**	**$21,183,269**	**$1,482,828**

[1]Total expenditures include non-university spending only. Revenue from campus spending such as tuition, campus housing costs and books purchased at the campus bookstore are captured in LMU-DCOM auxiliary revenue.

Source: Employment, spending and income data from Lincoln Memorial University; Multipliers and coefficients from 2006 IMPLAN Data, Minnesota Implan Group Inc., Retail Sales data from Tennessee Department of Revenue, U.S. Department of Commerce Bureau of Economic Analysis.

Figure 3
Primary Impact Region for Lincoln Memorial University



Construction activity only occurs during the construction year, whereas the other activities occur every year. Since the same methodology was used as in the previous section, only the summary impact table is presented. Data relative to the employment, income, and retail sales are presented in **Table 16**.

LMU has 437 employees and the regional employment multiplier is 1.51. This means that for each job created at LMU, another 0.51 job is created in other businesses due to LMU and its employees spending money in the region. The total estimated employment impact from LMU operations was 660 jobs. The economic impact of

construction, student spending and visitor spending activities was also measured and yielded a total impact of 1,717 jobs in the region. Income for LMU operations was $17.9 million. With the region's higher education sector income multiplier of 1.52, the total impact on income in the primary region due to operational activities was $27.2 million. In total, when including all activities of LMU, the total income impact in the region was $67.5 million.

The regional sales capture ratio will be smaller than the state due to purchases outside the region. By applying the regional sales capture ratio of 23.49 percent to the income impacts generated from all four activities, it was estimated that the impact on retail sales was over $15.8 million of retail sales. Impact on sales tax collection was not estimated due to the different tax rates throughout the region.

When comparing the state impacts to the regional impacts, the impacts of LMU on the primary impact region is only slightly less than the impact on the entire State of Tennessee. These results illustrate that most of the spending activity occurs in the region and only a small proportion of the secondary impacts are generated beyond this region.

Summary of All LMU Impacts

LMU was started to provide additional educational opportunities for residents in the Cumberland Gap area. It has successfully met the challenges and goals since 1897 and continues to do so today with increased enrollment through expansion efforts at additional satellite sites. Everyone understands the tremendous educational contributions that LMU provides to the State of Tennessee and to its primary region. Often overlooked, is the economic impacts that a university such as LMU has on the state and surrounding region. When all activities were included, the total impact of LMU on the

state's economy was 1,755 full and part-time jobs, $68.2 million in income, $21.2 million in retail sales and $1.5 million in state sales tax collections. This study clearly documents that LMU has a significant economic impact on both the State of Tennessee, particularly the immediate surrounding region.

Table 16
Economic Impact of Lincoln Memorial University on the Primary Impact Region, FY2007

Sector	Employment Direct	Employment Multiplier	Employment Total Impact	Income Direct	Income Multiplier	Income Total Impact	Retail Sales
University	437	1.51	660	$17,917,471	1.52	$27,234,556	$6,397,397
Construction	298	1.70	507	$11,766,664	1.68	$19,767,996	$4,643,502
Student Spending[1]	229	1.84	421	$9,383,928	1.82	$17,078,749	$4,011,798
Visitor Spending	91	1.42	129	$1,950,172	1.73	$3,373,798	$792,505
TOTAL	**1,055**		**1,717**	**$41,018,235**		**$67,455,099**	**$15,845,202**

[1]Total expenditures include non-university spending only. Revenue from campus spending such as tuition, campus housing costs and books purchased at the campus bookstore are captured in LMU-DCOM auxiliary revenue.

Source: Employment, spending and income data from Lincoln Memorial University; Multipliers and coefficients from 2006 IMPLAN Data, Minnesota Implan Group Inc., Retail Sales data from Tennessee Department of Revenue, U.S. Department of Commerce Bureau of Economic Analysis.

Appendix A

Review of Literature Relative to Impact Studies

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Review of Literature Relative to Impact Studies

For many years, researchers have been interested in quantifying the benefits, beyond the provision of degrees, of universities and colleges. One of the first detailed guides to measure the economic benefits of a college or university to the local community was requested by the American Council on Education (ACE) in 1968.[2] Based on some previous impact studies, Caffrey and Isaacs identified four primary groups that generated economic activity through spending. These four categories were: 1. the college, 2. faculty and staff, 3. students, and 4. visitors to the college. They developed several models and sub-models to estimate the spending. These models have provided the foundation for numerous economic impact studies since and are still being adopted today. For example, the Association of American Medical Colleges has been measuring the economic impact of their member institutions on the individual states in which they were located for a number of years. The results are based on adaptations of the ACE models with the latest study completed in 2006.[3]

Since the development of the ACE models, technology has simplified the process for deriving multipliers. The original ACE model depends upon numerous surveys to faculty, staff, students, local businesses and community residents and relies heavily upon proportional spending calculations to estimate indirect economic impact. It is a difficult model to implement and is less applicable to some colleges such as community colleges.[4] The proportion of money spent locally can be difficult to estimate. More recently, computer models have been created utilizing input-output analysis that not only make estimating the multiplier effect more reasonable, but allow different multipliers to be created for local, regional or state impacts (**Appendix B**). Two frequently used

computer models are the Regional Input-Output Modeling System (RIMS II) published by the U.S. Bureau of Economic Analysis and MicroIMPLAN developed by the United States Forest Service. These computer models have been used to estimate the impact of universities, medical schools, hospital construction and physician clinics, just to name a few.[5-11] For example, a detailed study estimating the impacts of the University of Arizona on the State of Arizona and Pima County Arizona was completed using the IMPLAN model.[11] This study measured the impacts of university operations and construction, as well as student and visitor spending. In 2001, the National Association of State Universities and Land-Grant Universities surveyed its members for their most recent economic impact reports. They published a summary analysis based on data from 96 member institutions and 10 member university systems.[12]

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Appendix B

Model and Data Used to Estimate Employment and Income Multipliers

Appendix B
Model and Data Used to Estimate Employment and Income Multipliers

A computer spreadsheet that uses state IMPLAN multipliers was developed to enable community development specialists to easily measure the secondary benefits of the health sector on a state, regional or county economy. The complete methodology, which includes an aggregate version, a disaggregate version, and a dynamic version, is presented in Measuring the Economic Importance of the Health Sector on a Local Economy: A Brief Literature Review and Procedures to Measure Local Impacts (Doeksen, et al., 1997). A brief review of input-output analysis and IMPLAN are presented here.

A Review of Input-Output Analysis

Input-output (I/O) (Miernyk, 1965) was designed to analyze the transactions among the industries in an economy. These models are largely based on the work of Wassily Leontief (1936). Detailed I/O analysis captures the indirect and induced interrelated circular behavior of the economy. For example, an increase in the demand for health services requires more equipment, more labor, and more supplies, which, in turn, requires more labor to produce the supplies, etc. By simultaneously accounting for structural interaction between sectors and industries, I/O analysis gives expression to the general economic equilibrium system. The analysis utilizes assumptions based on linear and fixed coefficients and limited substitutions among inputs and outputs. The analysis also assumes that average and marginal I/O coefficients are equal.

Nonetheless, the framework has been widely accepted and used. I/O analysis is useful when carefully executed and interpreted in defining the structure of a region, the interdependencies among industries, and forecasting economic outcomes.

The I/O model coefficients describe the structural interdependence of an economy. From the coefficients, various predictive devices can be computed, which can be useful in analyzing economic changes in a state, a region or a county. Multipliers indicate the relationship between some observed change in the economy and the total change in economic activity created throughout the economy.

MicroIMPLAN

MicroIMPLAN is a computer program developed by the United States Forest Service (Alward, et al., 1989) to construct I/O accounts and models. Typically, the complexity of I/O modeling has hindered practitioners from constructing models specific to a community requesting an analysis. Too often, inappropriate U.S. multipliers have been used to estimate local economic impacts. In contrast, IMPLAN can construct a model for any state, region, county, or zip code area in the United States by using available state, county, and zip code level data. Impact analysis can be performed once a regional I/O model is constructed.

Five different sets of multipliers are estimated by IMPLAN, corresponding to five measures of regional economic activity. These are: total industry output, personal income, total income, value added, and employment. The total impact of a change in the economy consists of direct, indirect, and induced impacts. Direct impacts are the changes in the activities of the impacting industry such as the addition of another physician and corresponding medical staff to the medical service area. The increased purchases of inputs by the new physician clinic as a result of the direct impact are the indirect impact on the business sectors.

Two types of multipliers are generated. Type I multipliers measure the impact in terms of direct and indirect effects. However, the total impact of a change in the economy consists of direct, indirect, and induced changes. Both the direct and indirect impacts change the flow of dollars to the state, region, or county's households. Subsequently, the households alter their consumption accordingly. The effect of the changes in household consumption on businesses in a community is referred to as an induced effect. To measure the total impact, a Type II multiplier is used. The Type II multiplier compares direct, indirect, and induced effects with the direct effects generated by a change in final demand (the sum of direct, indirect, and induced divided by direct). IMPLAN also estimates a modified Type II multiplier, called a Type SAM multiplier, which also includes the direct, indirect, and induced effects. The Type SAM multiplier further modifies the induced effect to include spending patterns of households based on a breakdown of households by nine different income groups.

Minnesota IMPLAN Group, Inc. (MIG)

Dr. Wilbur Maki at the University of Minnesota utilized the I/O model and database work from the U. S. Forest Service's Land Management Planning Unit in Fort Collins to further develop the methodology and to expand the data sources. Scott Lindall and Doug Olson joined the University of Minnesota in 1984 and worked with Maki and the model.

As an outgrowth of their work with the University of Minnesota, Lindall and Olson entered into a technology transfer agreement with the University of Minnesota that allowed them to form MIG. At first, MIG focused on database development and provided data that could be used in the Forest Service version of the software. In 1995,

MIG took on the task of writing a new version of the IMPLAN software from scratch. This new version extended the previous Forest Service version by creating an entirely new modeling system that included creating Social Accounting Matrices (SAMs) – an extension of input-output accounts, and resulting SAM multipliers. Version 2 of the new IMPLAN software became available in May of 1999. For more information about Minnesota IMPLAN Group, Inc., please contact Scott Lindall or Doug Olson by phone at 651-439-4421 or by email at info@implan.com or review their website at www.implan.com.

Appendix B References

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Appendix C

Dr. Doeksen's Professional Accomplishments

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Dr. Doeksen's Professional Accomplishments

Dr. Doeksen has 40 years of experience working with economic impact models. He has applied impact models to a variety of situations and also has advanced the theory of impact models. Dr. Doeksen's Master's thesis and Ph.D. dissertation both utilized input-output analysis, which is the most frequently used impact model. Both his thesis and dissertation received national awards.

Dr. Doeksen's early work in input-output analysis is referenced in textbooks such as Harry W. Richardson's book titled Input-Output and Regional Economics. He is given credit for groundbreaking work related to aggregation and size of multipliers.

Over the years, Dr. Doeksen has over 50 journal articles and publications regarding impact analysis. He has been involved with over 300 economic impact studies. These include such applications as to measure the economic impact of a university hospital, critical access hospital, golf course, manufacturing plant, large urban health clinic, medical program on a state's economy, dental practices, recreational facility, hotel, agricultural services, agricultural programs, etc. Results were used by local, state and federal policy makers to influence and justify political action. In addition, Dr. Doeksen is constantly being invited to speak at state, regional, national, and international conferences. He makes over 30 speaking engagements each year.

Dr. Doeksen's latest work with impact models is the founding of the National Center for Rural Health Works. The Center has been in operation over 10 years and its primary purpose is to train professionals in other states to measure the impact of health services on the rural economies. The Center is funded by the Federal Office of Rural Health Policy. Programs have been started in over 30 states. Dr. Doeksen continues to

operate as Director and is continually developing new applications of the economic impact models.

In summary, Dr. Doeksen is nationally known for his economic impact studies and research applications. These applications relate to rural economies, many of which focus on various segments of the health sector.