

The Economic Impact of The University of Tennessee Health Science Center in FY2010

Presented by
The Methodist Le Bonheur Center for Healthcare Economics
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EXECUTIVE SUMMARY

This study quantifies the economic impact of the University of Tennessee Health Science Center (UTHSC) on the economy of the state of Tennessee for FY2010. It addresses three specific questions:

1. How large is the total economic impact of UTHSC's teaching, research, and clinical practice activities?
2. How many jobs are created directly and indirectly by UTHSC?
3. How large is the health professional manpower contribution of UTHSC?

Total Impact

In FY2010, a total of \$970 million in direct spending attributable to UTHSC operations was injected into the Tennessee economy. Of this total, the largest amount, or \$529 million, came from the expenditures generated by the clinical services delivered by the clinical faculty of UTHSC. Budgeted university spending (\$388 million which included \$126.6 million from state appropriations) represents the second largest source of spending, followed by dollars spent by students and visitors (\$39.4 million and \$13.5 million, respectively).

When economic multiplier effects were taken into account, the total economic contribution of UTHSC amounted to more than \$2.3 billion of total output. Considering that UTHSC received just \$126.6 million of state appropriated dollars in FY 2010, the \$2.3 billion of total impact exceeds the state appropriation by a factor of over 18 to 1.

Table ES-1. Estimated Economic Impact of UTHSC on Tennessee, FY2010

Category	Direct Expenditures	Impacts		
		Output	Earnings	Employment
University Spending	\$388,134,304	\$ 963,504,596	\$330,845,681	9,687
Clinical Practice Operations*	529,021,835	1,247,459,937	443,346,749	10,447
Student Spending	39,410,445	80,586,831	21,377,301	569
Visitor Spending	13,465,119	30,334,847	9,038,928	393
Total Impact	\$970,031,702	\$2,321,886,212	\$804,608,659	21,096

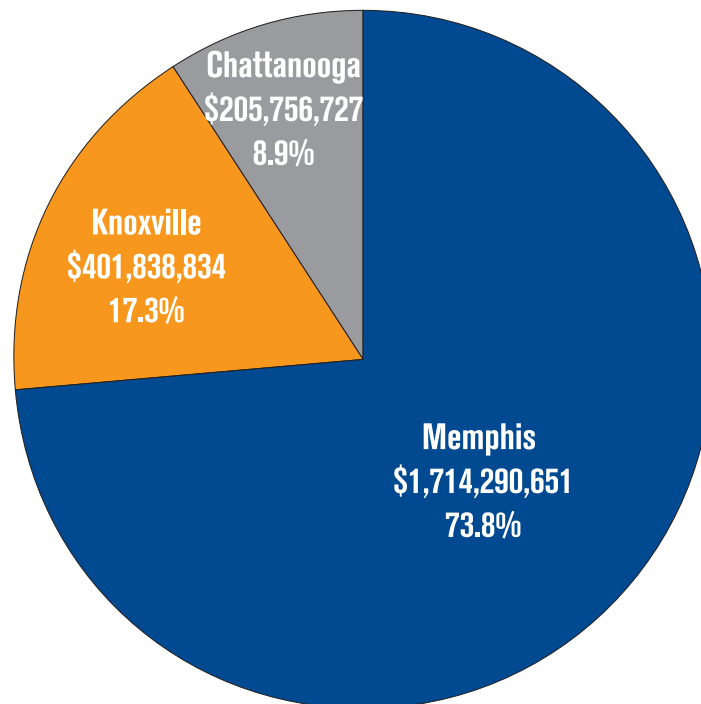
*Clinical practice operations are unique to the College of Medicine.

UTHSC was directly and indirectly responsible for approximately 21,096 jobs in Tennessee which, in turn, generated a total of more than \$804 million in earnings. It should be noted that the total output effect of \$2.3 billion includes both direct expenditures by UTHSC and the subsequent downstream employment earnings.

Impact by Location

Memphis, the main campus of UTHSC, contributed the most in total economic impact, representing about 73.8 percent of the total impact. The other two major locations, Knoxville and Chattanooga, represent 17.3 percent and 8.9 percent, respectively, of the total. (See Chart ES-1.)

Chart ES-1. Distribution of \$2.3 Billion of Total Output Impact by Location

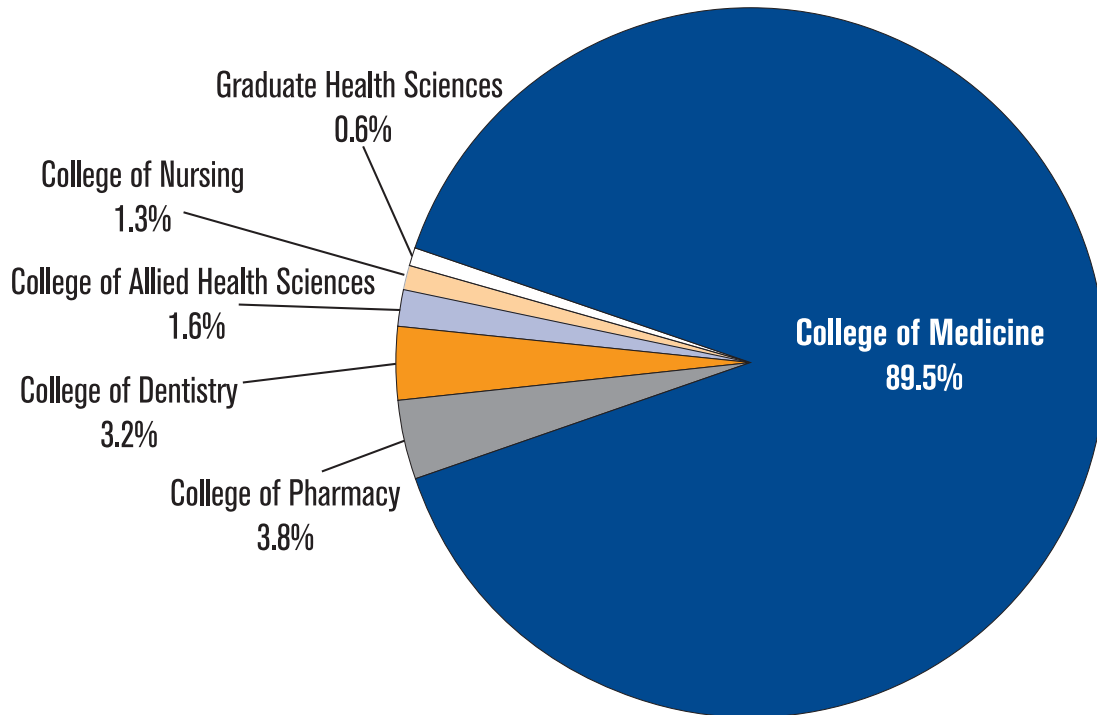


Impact by College

Among the major academic units, the College of Medicine contributed over \$2.07 billion (or 89.5 percent) of total economic contribution in FY2010. This was followed by the College of Pharmacy (\$87.2 million, or 3.8 percent), the College of Dentistry (\$73.9 million, or 3.2 percent), the

College of Allied Health Sciences (\$38.1million, or 1.6 percent), and the College of Nursing (\$31.0 million, or 1.3 percent), and Graduate Health Sciences (\$13.3 million, or 0.6 percent).¹ (See Chart ES-2.)

Chart ES-2. Distribution of \$2.3 Billion of Total Output Impact by College



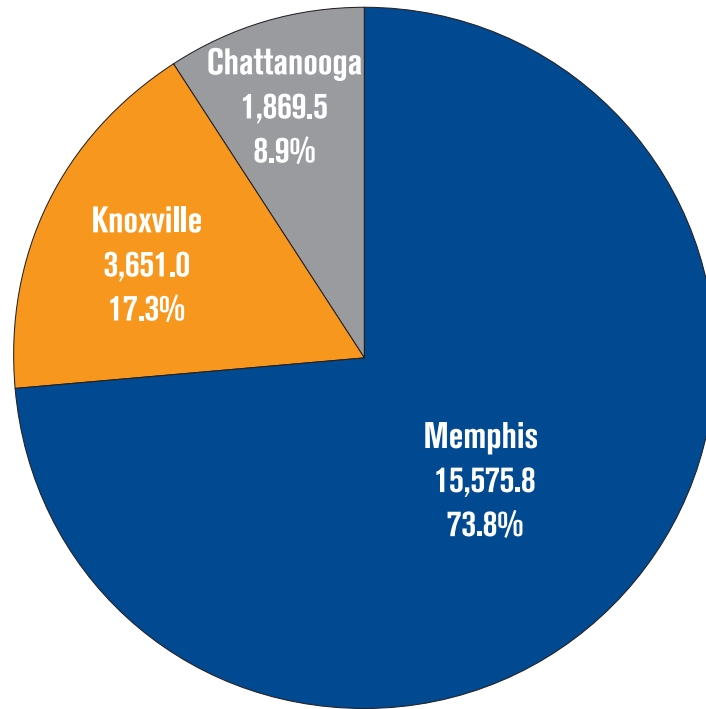
Note: Total may not add due to rounding.

Employment and Earnings

Of the total of 21,096 jobs created for Tennessee as a result of the operation of UTHSC, the largest share (73.8 percent, or approximately 15,576 jobs) in the Memphis area. Similarly, the College of Medicine was responsible for more job creation than the other colleges combined. It is worth noting that the 21,096 of the total jobs created resulted in a total of \$792.1 million of earnings, or about \$38,140 per worker in FY2010. In comparison Tennessee per capita personal income in 2010 was just \$35,307. (See Chart ES-3.)

¹Note that 53.7 percent of the output impact was derived from clinical practice operations, which are unique to the College of Medicine.

Chart ES-3. Jobs Created by UTHSC

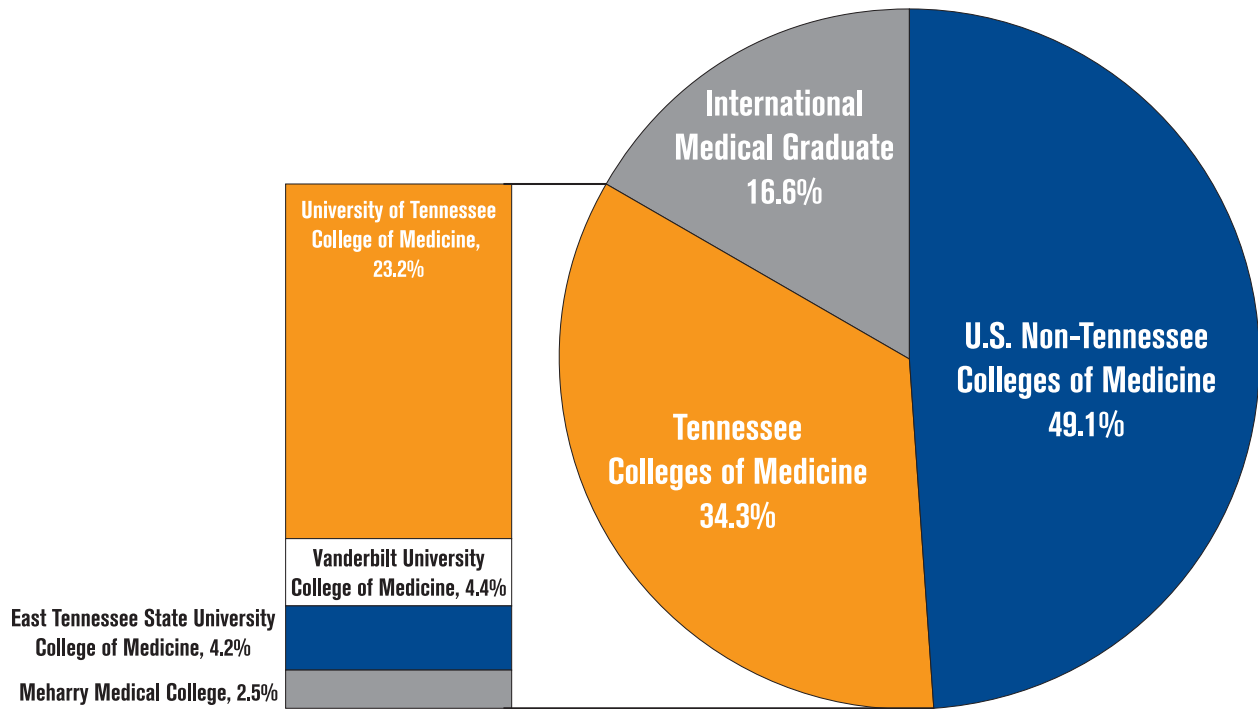


Physician Manpower Contribution

In addition to its economic impacts, the University of Tennessee Health Science Center has a substantial impact on the well being of the citizens of Shelby County and the state of Tennessee through its role in educating and training health care manpower. Of all physicians practicing in Tennessee, for example, 4,604 (34.3 percent) were graduates of one of the four Tennessee colleges of medicine (COM); of these, 66.7 percent (3,113) were graduates of the University of Tennessee College of Medicine. The other three medical schools in Tennessee (Vanderbilt University, Meharry Medical College, and East Tennessee State University) together account for just 11.1 percent. (See Chart ES-4.)

The University of Tennessee Health Science Center also has the largest Graduate Medical Education (GME) program in the state, training 1,026 interns, residents, and fellows in the 2010-2011 academic year. Importantly, 455 of the total trainees in 2010–2011 specialized in primary care, an area of practice that will play an increasingly critical role in the delivery of cost effective care in the near future. Equally important, approximately 50.0 percent or more of the UTHSC-sponsored GME trainees remain in Tennessee to practice irrespective of where they attended medical schools.

Chart ES-4. Distribution of Tennessee Physicians by College of Medicine Attended (n = 13,430)



Source: *Physician Masterfile*, American Medical Association, June 2010.

I. INTRODUCTION

The University of Tennessee Health Science Center (UTHSC) was founded in 1911 and is currently celebrating its centennial anniversary. As Tennessee’s flagship statewide academic health system, its mission is to “bring the benefits of the health sciences to the achievement and maintenance of human health, with a focus on the citizens of Tennessee, by pursuing an integrated program of education, research, clinical care, and public service.”¹

Over 2,800 students are currently enrolled in its 3 undergraduate and more than 20 graduate programs. In 2010, 700 students graduated from its 6 colleges:

- The College of Allied Health Sciences, with over 9,000 alumni offers 15 professional degree programs at the undergraduate and graduate levels;
- The College of Dentistry, the oldest dental college in the south with over 7,200 graduates;
- The College of Graduate Health Sciences, that has granted over 1,200 Doctor of Philosophy and Master’s degrees in 9 degree programs;
- The College of Medicine, that has awarded the MD degree to over 13,400 physicians;
- The College of Nursing, the oldest nursing school in Mid-South, offers Masters of Nursing (MSN) and Doctor of Nursing Practice (DNP) degrees; and
- The College of Pharmacy, ranked 16th among the nation’s Doctor of Pharmacy programs, has more than 5,600 graduates.

The Health Science Center is based in Memphis, the home to all six colleges. The colleges of Allied Health Sciences (CAHS), Medicine (COM), and Pharmacy (COP) also have programs based in Knoxville, and the Colleges of Allied Health Sciences and Medicine have programs based in Chattanooga. Beyond these sites, UTHSC maintains educational, clinical, and research programs in most of the counties across the state.

In addition to its education, research, and patient care roles, UTHSC is a major contributor to the economy of the state. In the process of providing higher education and professional training, UTHSC spends millions of dollars every year on the salaries of faculty and staff and on the purchases of goods and services from suppliers. In turn, faculty and staff members spend large portions of their salaries in the local economy. Additionally, UTHSC also attracts students from

¹The University of Tennessee Health Science Center. *The Legacy The Future. A Centennial Portrait of the University of Tennessee Health Science Center*. Helena, MT: Sweetgrass Books, 2011.

around the state and nation, and these students often bring families with them. While here, these students and their families spend their earnings and savings within the Tennessee economy as they go about their daily lives.

This study quantifies the economic impact of the UTHSC on the economy of the state of Tennessee for FY2010. It addresses three specific questions:

1. How large is the total economic impact of UTHSC's teaching, research, and clinical practice activities?
2. How many jobs are created directly and indirectly by UTHSC?
3. How large is the health professional manpower contribution of UTHSC?

II. METHODOLOGY AND DATA SOURCES

Regional Input-Output Modeling System (RIMS II)

This study uses the RIMS II economic impact model developed by the U.S. Bureau of Economic Analysis (BEA) to estimate the economic impact of UTHSC on the economy of Tennessee.² The underlying theory of the model is the multiplier effect that captures the total effects of how the dollars spent by one person or one institution flow through the economy. These effects create cascading waves of ripple effects as the initial dollars spent change hands from one person to another.

Thus, the total multiplier effects of UTHSC begin with an initial, direct injection of expenditures into the economy. These direct expenditures include payrolls and other purchases, made by UTHSC to carry out its education, clinical, and research activities. Indirect effects capture the “downstream” linkages from the direct activities of UTHSC. For example, employees of UTHSC spend their paychecks in the local economy, thereby creating jobs and revenue in a wide range of industries such as food, housing and consumer durables. Similarly, construction and maintenance dollars of UTHSC create jobs and incomes in construction, heavy construction equipment, and construction material industries. The indirect effects also include jobs and earnings derived from the “downstream” spending of businesses and households that results from their increased earnings. For example, workers and employees in the food, housing, and consumer durable industries use their additional earnings to purchase food, clothing, insurance, and other items. These purchases then create more jobs and earnings in many sectors across the economy.

Data Sources

This impact study used multiple sources of data. The first type of data, the total direct injection of dollars into the economy, came directly from the budget records of UTHSC as provided by the UTHSC administration for FY2010. These data were supplemented by additional data sources. We conducted a carefully designed, field-tested survey of UTHSC faculty, staff, and students to estimate total purchases of goods and services by those who work for or study at UTHSC and their spending habits. Also included in the survey were estimates of the number of out-of-town guests who came to Tennessee to visit UTHSC faculty members or students and the resulting dollars spent by these visitors.

²See U.S. Department of Commerce, Bureau of Economic Analysis, *Regional Multipliers: A User Handbook for the Regional Input-Output Modeling System (RIMS II)*. 3rd ed. Washington, D.C.: U.S. Government Printing Office, 1997.

Another set of supplemental data came from the financial records of the University of Tennessee Medical Group (UTMG), a large multi-specialty physician practice group wholly owned by UTHSC. Through the outpatient services delivered by the clinical faculty, UTMG generates millions of dollars of expenditures to support the operations of UTHSC.

Finally, we added to the total initial injection of UTHSC dollars an estimated amount of total inpatient expenditures earned by area hospitals to which UTMG patients were admitted. These dollars were not dollars earned by UTMG or UTHSC, but, these dollars were earned by the admitting hospitals. We used a formula specially designed by the authors based on the financial relationship between inpatient and outpatient services to estimate the dollar value of inpatient expenditures that could be attributed the outpatient services delivered by clinicians of UTMG.

Study Limitations

Every study has its limitations, and this study is no exception. The limitations fall into three general categories. First, assumptions and data limitations determine the output of every impact study. Second, the economic model used in the impact study determines the outcomes generated. Third, economic impact models are focused on economic variables that can be measured and calculated from the models and ignore other variables that may impact the quality of life or health outcomes.

In this study, the data used were from two sources, financial data provided by the University for the FY2010 and survey based spending data generated from a survey of UTHSC faculty, staff and students. The quality of the financial data was excellent but some assumptions had to be made in allocating administrative expenditures to colleges and locations based on college budgets. Variations in administrative involvement in the operations of each unit will not be reflected in the allocations except for the budget-based distribution.

Survey data were self-reported data and have all of the limitations of any data set of this type. It is as accurate as the care the respondents took in responding to the survey questions. Special attention was paid to pointing out the importance of the survey and the need to be as accurate as possible but in the end it is impossible to control for respondent errors either intentional or otherwise.

The economic model used in this impact study is the widely recognized model known as RIMS II. It has a long history of being used in impact studies and is one of the two major national models that are frequently cited in impact studies. It focuses on generating economic data on total em-

ployment, earnings and output generated from a given injections of spending into a state or local economy. The model is available for all states and the model for Tennessee was used in this study. But the RIMS II model is not the only way to calculate the economic impact of a university. One major alternative is a human capital model that captures the change in lifetime earnings generated by the graduates. The focus of human capital models is on measuring inputs and outputs in the production process for universities. The human capital model is more labor intensive, more complex, and requires income data for graduates that are difficult to obtain. But, it provides a good look at the costs and benefits of providing a university based education.

Finally, economic impact studies are by definition limited in scope and fail to measure many other aspects of a university. Many university programs are not solely focused on employment and productivity improvement. Factors such as the impact of UTHSC on the economic development of the state and the community are not part of part of an impact study. Other factors like the impact of UTHSC on the health of the state and the nation are not calculated in our models. UTHSC has an impact on the quality of life in Memphis and other areas of Tennessee and those factors are not included in this impact study. Many faculty, staff and students are active participants in all aspects of life in the community including volunteering thousands of hours to charity. These contributions are above and beyond the impact data cited in this report.

III. TOTAL ECONOMIC IMPACT

Total Direct Expenditures

To measure the economic impact of any organization or entity, it is necessary to look first at its expenditures.³ In fact, the RIMS II economic impact methodology employs deliveries to final demand as measured by total expenditures or revenues of the entity in question as the primary driver of the economic impact model. Accordingly, Table 1 presents total expenditures from all sources for which data were available for UTHSC for FY2010.

Table 1. UTHSC Total Expenditures by Source, FY2010

1. University Spending	
Tuition and Fees	\$ 55,040,679
State Appropriations	126,611,727
Continuing Education Expenditures	2,862,709
Grants, Contracts, Endowment, Other	178,424,933
Clinical Services	25,194,256
University Spending Total	\$388,134,304
2. Clinical Practice Operations Attributable to Faculty	
Memphis	\$348,970,488
Knoxville	115,194,142
Chattanooga	64,857,206
Clinical Practice Operations Total	\$529,021,835
3. Student Spending	
Estimated Student Spending	\$ 39,410,445
Total Student Spending	\$ 39,410,445
4. Visitor Spending	
Estimated Visitor Spending	\$ 13,465,119
Visitor Spending Total	\$ 13,465,119
Estimated Total Direct Spending	\$970,031,702

Note: Data were unavailable for non-salary faculty income, including honoraria, speaking fees, patent income, book royalties, etc. As such, the expenditure figures presented here may be understated.

For the purposes of analysis, UTHSC expenditures were divided into four categories: (1) university spending; (2) clinical practice operations attributable to faculty; (3) student spending; (4) visitor spending. Expenditures from university spending are simply expenditures from all sources that appear in UTHSC's FY2010 budget. As shown in Section 1 of Table 1, about 47.0 percent of UTHSC's total university spending comes from tuition, fees, and state appropriations. The remain-

³Total revenues and/or expenditures, depending upon data availability, can be used within RIMS II. In the context of this analysis we use the terms interchangeably.

ing 53.0 percent comes from other sources, including nearly \$178.4 million in grants and contracts and almost \$25.2 million from the provision of contracted clinical services.

Along with the interns and residents that they supervise, many UTHSC faculty members provide direct patient care in clinical practices such as the UT Medical Group, serving thousands of patients across the state. The expenditures supported by patient care revenues generated by UTHSC clinicians are accounted for in Section 2 of Table 1. There are two parts to clinical practice operations expenditures: physician payments and hospital payments. Physician payments account for approximately 40.0 percent of clinical practice expenditures, while hospital payments account for 60.0 percent.⁴ Both parts are accounted for in Section 2 of Table 1.

As shown in Section 3 of Table 1, student spending was measured using data gathered through an online survey process and combined with supplemental data from the Consumer Expenditure Survey produced by the U.S. Bureau of Labor Statistics. Student spending for FY2010 was estimated at over \$39.4 million.

Section 4 of Table 1 shows visitor spending by individuals coming to the state to visit faculty, staff, or students of UTHSC. Visitor spending was also estimated using data gathered through the same on-line survey of faculty, staff, and students. Total visitor spending in FY2010 was estimated at just under \$13.5 million.

Total Economic Impact

Expenditures from all sources in Table 1 total over \$970.0 million in direct economic impact on the state's economy. Expenditures from Table 1 were combined with the RIMS II economic impact methodology to calculate the total economic impact. As shown in Table 2, UTHSC total expenditures from all sources were estimated to have resulted in an indirect output impact of nearly \$1.4 billion, for a total impact of more than \$2.3 billion in the output of goods and services. Considering

⁴Cyril F. Chang, "Economic Impacts of Methodist Le Bonheur Healthcare," a special report prepared by the Methodist Le Bonheur Center for Healthcare Economics at the University of Memphis, February 20, 2009. Using this ratio and expenditures data from University of Tennessee Medical Group (Memphis), we estimated direct, Memphis-based UTHSC faculty generated clinical practice expenditures at nearly \$349.0 million. Data for faculty generated clinical practice expenditures in Knoxville and Chattanooga were unavailable and, therefore, were estimated using the ratio of local faculty to Memphis-based faculty.

Table 2. Estimated Economic Impact of UTHSC on Tennessee, FY2010

Category	Direct Expenditures	Impacts		
		Output	Earnings	Employment
University Spending	\$388,134,304	\$ 963,504,596	\$330,845,681	9,687
Clinical Practice Operations	529,021,835	1,247,459,937	443,346,749	10,447
Student Spending	39,410,445	80,586,831	21,377,301	569
Visitor Spending	13,465,119	30,334,847	9,038,928	393
Total Impact	\$970,031,702	\$2,321,886,212	\$804,608,659	21,096

that UTHSC received just \$126.6 million of state appropriated dollars in FY2010, the \$2.3 billion of total impact exceeds the state appropriation by a factor of more than 18 to 1.⁵

In the process of stimulating economic activities in Tennessee, UTHSC was directly and indirectly responsible for an estimated 21,096 jobs in Tennessee that, in turn, generated a total of more than \$804.6 million in earnings. This equates to approximately \$38,140 per worker in FY2010. In comparison, Tennessee per capita personal income in 2010 was just \$35,307.⁶

Tables 3 and 4 present the total impact of UTHSC on Tennessee's output, earnings, and employment by college and campus, respectively. Details of the impact by college and location are provided in later sections of this report.

Table 3. Estimated Economic Impact of UTHSC by College, FY2010

College	Direct Expenditures	Impacts		
		Output	Earnings	Employment
Allied Health Sciences	\$ 16,709,755	\$ 38,101,158	\$ 11,844,066	339
Dentistry	30,653,435	73,951,021	24,594,653	722
Graduate Health Sciences	6,080,665	13,302,633	3,912,513	109
Medicine	866,249,264	2,078,255,486	726,106,070	18,819
Pharmacy	37,020,746	87,255,338	28,249,491	821
Nursing	13,317,838	31,020,576	9,901,864	286
Total	\$970,031,702	\$2,321,886,212	\$804,608,659	21,096

⁵In our 2001 economic impact study for UTHSC, the total impact was estimated to exceed state appropriation by a factor of 20 to 1. This was mainly due to the inclusion of the contribution of TLC, a managed care company owned jointly by UTHSC and the Regional Medical Center at Memphis. TLC was sold in 2007 and is not included in the current study. For details of the earlier study, see Cyril F. Chang and David M. Mirvis, "The Economic Impact of the University of Tennessee Health Science Center," February 22, 2001.

⁶U.S. Bureau of Economic Analysis.

Table 4. Estimated Economic Impact of UTHSC by Location, FY2010

College	Direct Expenditures	Impacts		
		Output	Earnings	Employment
Chattanooga	\$85,960,521	\$ 205,756,727	\$ 71,301,360	1,869
Memphis	716,191,978	1,714,290,651	594,057,148	15,576
Knoxville	167,879,204	401,838,834	139,250,151	3,651
Total	\$970,031,702	\$2,321,886,212	\$804,608,659	21,096

The College of Medicine is the college with the most budgeted expenditures and, accordingly has the largest estimated economic impacts (89.5 percent). Similarly, with the largest portion of the operations of all colleges located in Memphis, the largest estimated economic impact is on the Memphis area (73.8 percent). UTHSC’s economic contributions to the Knoxville and Chattanooga economies are also substantial.

IV. FACULTY, STAFF, AND STUDENT SPENDING

The economic impact of faculty and student spending would not take place in Tennessee were it not for the presence of UTHSC. In UTHSC’s absence, it can reasonably be assumed that most UTHSC faculty members and students would seek employment and education at universities in other states. Faculty, student, and staff spending are presented by economic sector in Table 5 as a way of detailing how UTHSC impacts the state’s economy. In FY2010, it is estimated that UTHSC faculty, students, and staff spent over \$176.3 million in the state’s economy. As shown in the table, this total was spread throughout the state’s economy including more than \$13.8 million in charitable contributions, over \$15.4 million on groceries and eating out, more than \$8.6 million on utilities, and more than \$10.7 million on retail purchases excluding food.

Table 5. Combined Direct Spending by UTHSC Faculty, Staff, and Students, FY2010

Category	Faculty	Staff	Students	Total
Rent, Lease, Mortgage Average	\$28,353,542	\$23,545,818	\$23,994,081	\$ 75,893,441
Contributions	7,733,258	4,377,515	1,754,664	13,865,437
Utilities	4,492,638	2,130,297	2,041,403	8,664,338
Food at Home	4,873,371	1,898,743	2,433,981	9,206,094
Food Services and Drinking Places	4,188,053	1,134,614	922,557	6,245,225
Retail Trade Excluding Food	6,777,031	1,945,053	1,982,517	10,704,601
Transportation	11,726,548	4,075,350	2,414,352	18,216,250
Recreation Average	4,416,492	1,273,547	883,300	6,573,338
Medical Expenses	4,111,906	1,736,655	1,609,568	7,458,129
Other Services	15,533,869	2,593,405	1,374,022	19,501,295
Total	\$92,206,708	\$44,710,996	\$39,410,445	\$176,328,149

V. ECONOMIC CONTRIBUTION OF INDIVIDUAL COLLEGES

The economic contribution of the individual colleges of UTHSC is presented in this section. While none of the colleges operate independently, each college has a different focus and different activities. Some colleges are located in one location (e.g., Dentistry), while others have activities and operations in Memphis, Knoxville, and Chattanooga. The focus here is upon each college as a whole and not the distribution of economic contribution among the different locations.

A. The Economic Impact of the College of Medicine

Table 6 presents total expenditures from all sources for the College of Medicine (COM) for FY2010. Less than 33.0 percent of COM spending was funded by state appropriations, while 46.0 percent came from grants, contracts, endowments, and other sources.

**Table 6. Estimated College of Medicine
Total Expenditures by Source, FY2010**

1. University Spending	
Tuition and Fees	\$ 45,025,184
State Appropriations	103,572,784
Continuing Education Expenditures	2,341,795
Grants, Contracts, Endowment, Other	145,957,783
Clinical Services	20,609,775
University Spending Total	\$317,507,321
2. Clinical Practice Operations Attributable to Faculty	
Memphis	\$348,970,488
Knoxville	115,194,142
Chattanooga	64,857,206
Clinical Practice Operations Total	\$529,021,835
3. Student Spending	
Estimated Student Spending	8,705,174
Total Student Spending	\$ 8,705,174
4. Visitor Spending	
Estimated Visitor Spending	11,014,934
Visitor Spending Total	\$ 11,014,934
Estimated Total Direct Spending	\$866,249,264

Note: Data were unavailable for non-salary faculty income, including honoraria, speaking fees, patent income, book royalties, etc. As such, the expenditure figures presented here may be understated.

Total Impact

Expenditures from all sources in Table 6 totals nearly \$866.3 million in direct economic impact on the state's economy. As shown in Table 7, COM total expenditures from all sources is estimated to have resulted in an indirect output impact of over \$1.2 billion for a total impact of almost \$2.1 billion in output, supporting a total of approximately 18,819 jobs, and total earnings of more than \$726.1 million.

Table 7. Estimated Economic Impact of the College of Medicine, FY2010

Category	Direct Expenditures	Impacts		
		Output	Earnings	Employment
University Spending	\$317,507,321	\$ 788,180,174	\$270,643,240	7,925
Clinical Practice Operations	529,021,835	1,247,459,937	443,346,749	10,447
Student Spending	8,705,174	17,800,419	4,721,924	126
Visitor Spending	11,014,934	24,814,957	7,394,157	322
Total Impact	\$866,249,264	\$2,078,255,486	\$726,106,070	18,819

Faculty, Student, and Staff Spending

In FY2010, it is estimated that COM faculty, students, and staff spent nearly \$121.0 million in the state's economy. As shown in Table 8, this total was spread throughout the state's economy, including nearly \$10.3 million in charitable contributions, almost \$10.6 million on groceries and eating out, more than \$5.8 million on utilities, and over \$7.5 million on retail purchases excluding food.

Table 8. Estimated Direct Spending by the College of Medicine Faculty, Staff, and Students, FY2010

Category	Faculty	Staff	Students	Total
Rent, Lease, Mortgage Average	\$23,194,181	\$19,261,296	\$5,299,932	\$ 47,755,408
Contributions	6,326,073	3,580,959	387,579	10,294,611
Utilities	3,675,134	1,742,656	450,915	5,868,706
Food at Home	3,986,586	1,553,237	537,630	6,077,453
Food Services and Drinking Places	3,425,972	928,154	203,779	4,557,905
Retail Trade Excluding Food	5,543,846	1,591,121	437,908	7,572,876
Transportation	9,592,723	3,333,778	533,294	13,459,794
Recreation Average	3,612,844	1,041,806	195,108	4,849,757
Medical Expenses	3,363,682	1,420,644	355,529	5,139,855
Other Services	12,707,243	2,121,495	303,501	15,132,239
Total	\$75,428,285	\$36,575,145	\$8,705,174	\$120,708,604

B. The Economic Impact of the College of Pharmacy

Table 9 presents total expenditures from all sources for the College of Pharmacy (COP) for FY2010.

**Table 9. Estimated College of Pharmacy
Total Revenues by Source, FY2010**

1. University Spending	
Tuition and Fees	\$ 5,374,479
State Appropriations	12,363,076
Continuing Education Revenue	1,069,580
Grants, Contracts, Endowment, Other	7,170,317
University Spending Total	\$25,977,452
2. Student Spending	
Estimated Student Spending	\$ 10,142,086
Total Student Spending	\$ 10,142,086
4. Visitor Spending	
Estimated Visitor Spending	\$ 901,207
Visitor Spending Total	\$ 901,207
Estimated Total Direct Spending	\$37,020,746

Note: Data were unavailable for non-salary faculty income, including honoraria, speaking fees, patent income, book royalties, etc. As such, the expenditure figures presented here may be understated.

Total Impact

Expenditures from all sources in Table 9 totals over \$37.0 million in direct economic impact on the state's economy. As shown in Table 10, COP expenditures from all sources are estimated to have resulted in an indirect output impact of more than \$50.0 million, for a total impact of over \$87.2

Table 10. Estimated Economic Impact of UTHSC College of Pharmacy, FY2010

Category	Direct Expenditures	Impacts		
		Output	Earnings	Employment
University Spending	\$25,977,452	\$64,486,427	\$22,143,180	648
Student Spending	10,142,086	20,738,629	5,501,344	146
Visitor Spending	901,207	2,030,282	604,967	26
Total Impact	\$37,020,746	\$87,255,338	\$28,249,491	821

million in output, and supporting a total of approximately 821 jobs and total earnings of more than \$28.2 million.

Faculty, Student, and Staff Spending

Faculty and student spending would not take place in Tennessee were it not for the presence of COP. In COP's absence, it can reasonably be assumed that most COP faculty members and students would seek employment and education at universities in other states. In Table 11, faculty, student, and staff spending is presented as a way of detailing how COP impacts the state's economy. In FY2010, it is estimated that COP faculty, students, and staff spent over \$19.3 million in the state's economy. As shown in the table this total was spread throughout the state's economy including over \$1.2 million in charitable contributions, more than \$1.6 million on groceries and eating out, more than \$968,000 on utilities, and nearly \$1.1 million on retail purchases excluding food.

**Table 11. Estimated Direct Spending by the College of Pharmacy
Faculty, Staff, and Students, FY2010**

Category	Faculty	Staff	Students	Total
Rent, Lease, Mortgage Average	\$1,897,675	\$1,575,899	\$ 6,174,760	\$ 9,648,334
Contributions	517,579	292,983	451,554	1,262,116
Utilities	300,688	142,579	525,345	968,612
Food at Home	326,170	127,081	626,373	1,079,624
Food Services and Drinking Places	280,302	75,939	237,416	593,657
Retail Trade Excluding Food	453,580	130,181	510,191	1,093,952
Transportation	784,846	272,759	621,322	1,678,927
Recreation Average	295,592	85,237	227,313	608,142
Medical Expenses	275,206	116,233	414,215	805,653
Other Services	1,039,667	173,574	353,598	1,566,839
Total	\$6,171,305	\$2,992,464	\$10,142,086	\$19,305,855

C. The Economic Impact of the College of Dentistry

Table 12 presents total expenditures for the College of Dentistry (COD) for FY2010. State appropriations provided 44.6 percent of COD spending while the remaining 55.4 percent came from other sources.

Table 12. Estimated College of Dentistry Total Expenditures by Source, FY2010

1. University Spending	
Tuition and Fees	\$ 4,918,046
State Appropriations	11,313,130
Continuing Education Expenditures	409,020
Grants, Contracts, Endowment, Other	3,817,197
Clinical Services	4,880,723
University Spending Total	\$25,338,116
2. Student Spending	
Estimated Student Spending	4,436,291
Total Student Spending	\$ 4,436,291
3. Visitor Spending	
Estimated Visitor Spending	879,028
Visitor Spending Total	\$ 879,028
Estimated Total Direct Spending	\$30,653,435

Note: Data were unavailable for non-salary faculty income, including honoraria, speaking fees, patent income, book royalties, etc. As such, the expenditure figures presented here may be understated.

Total Impact

Expenditures from all sources in Table 12 totals over \$30.6 million in direct economic impact on the state's economy. As shown in Table 13, COD expenditures from all sources is estimated to have resulted in an indirect output impact of nearly \$43.3 million, for a total impact of almost \$74.0

Table 13. Estimated Economic Impact of UTHSC College of Dentistry, FY2010

Category	Direct Expenditures	Impacts		
		Output	Earnings	Employment
University Spending	\$25,338,116	\$62,899,340	\$21,598,210	632
Student Spending	4,436,291	9,071,367	2,406,365	64
Visitor Spending	879,028	1,980,314	590,078	26
Total Impact	\$30,653,435	\$73,951,021	\$24,594,653	722

million in output, supporting a total of approximately 722 jobs and total earnings of nearly \$24.6 million.

Faculty, Student, and Staff Spending

Data in Table 14 show the COD faculty, student, and staff spending by economic sector. In FY2010, we estimated that COD faculty, students, and staff spent nearly \$13.4 million in the state's economy, including almost \$1.0 million in charitable contributions, nearly \$1.2 million on groceries and eating out, more than \$660,000 on utilities, and almost \$800,000 on retail purchases excluding food.

Table 14. Estimated Direct Spending by College of Dentistry Faculty, Staff, and Students, FY2010

Category	Faculty	Staff	Students	Total
Rent, Lease, Mortgage Average	\$1,850,971	\$1,537,114	\$2,700,927	\$6,089,012
Contributions	504,841	285,772	197,516	988,130
Utilities	293,288	139,070	229,793	662,151
Food at Home	318,143	123,953	273,984	716,080
Food Services and Drinking Places	273,404	74,070	103,849	451,322
Retail Trade Excluding Food	442,417	126,977	223,165	792,558
Transportation	765,530	266,046	271,775	1,303,352
Recreation Average	288,317	83,139	99,430	470,886
Medical Expenses	268,433	113,372	181,183	562,988
Other Services	1,014,079	169,302	154,669	1,338,050
Total	\$6,019,422	\$2,918,815	\$4,436,291	\$13,374,529

D. The Economic Impact of the College of Allied Health Sciences

Table 15 presents total expenditures for the College of Allied Health Sciences (CAHS) for FY2010.

**Table 15. Estimated College of Allied Health Sciences
Total Expenditures by Source, FY2010**

1. University Spending	
Tuition and Fees	\$ 2,476,218
State Appropriations	5,696,118
Grants, Contracts, Endowment, Other	669,455
University Spending Total	\$ 8,841,791
2. Student Spending	
Estimated Student Spending	\$ 7,561,225
Total Student Spending	\$ 7,561,225
3. Visitor Spending	
Estimated Visitor Spending	\$ 306,739
Visitor Spending Total	\$ 306,739
Estimated Total Direct Spending	\$16,709,755

Note: Data were unavailable for non-salary faculty income, including honoraria, speaking fees, patent income, book royalties, etc. As such, the expenditure figures presented here may be understated.

Total Impact

Expenditures from all sources in Table 15 totals over \$16.7 million in direct economic impact on the state's economy. As shown in Table 16, CAHS total expenditures from all sources is estimated to have resulted in an indirect output impact of nearly \$21.4 million, for a total impact of more than \$38.1 million in output, and supporting approximately 339 jobs with total earnings of just over \$11.8 million. The indirect impact is a result of the businesses and individuals who work in each of the industries listed spending their earnings and gross receipts in the local economy.

**Table 16. Estimated Economic Impact of UTHSC College of
Allied Health Sciences, FY2010**

Category	Direct Expenditures	Impacts		
		Output	Earnings	Employment
University Spending	\$ 8,841,791	\$21,948,862	\$ 7,536,743	221
Student Spending	7,561,225	15,461,261	4,101,415	109
Visitor Spending	306,739	691,035	205,909	9
Total Impact	\$16,709,755	\$38,101,158	\$11,844,066	339

Faculty, Student, and Staff Spending

Data in Table 17 show the breakdown of faculty, student, and staff spending by economic sector. We estimate that CAHS faculty, students, and staff spent nearly \$42.7 million in the state's economy, including over \$3.7 million in charitable contributions, nearly \$3.1 million on groceries and eating out, more than \$2.0 million on utilities, and nearly \$2.0 million on retail purchases excluding food.

Table 17. Estimated Direct Spending by College of Allied Health Sciences Faculty, Staff, and Students, FY2010

Category	Faculty	Staff	Students	Total
Rent, Lease, Mortgage Average	\$ 645,900	\$17,384,304	\$4,603,466	\$22,633,670
Contributions	176,165	3,231,998	336,647	3,744,811
Utilities	102,343	1,572,837	391,660	2,066,840
Food at Home	111,017	1,401,876	466,980	1,979,872
Food Services and Drinking Places	95,405	837,706	177,000	1,110,112
Retail Trade Excluding Food	154,382	1,436,068	380,363	1,970,813
Transportation	267,134	3,008,905	463,214	3,739,252
Recreation Average	100,609	940,283	169,468	1,210,360
Medical Expenses	93,670	1,282,204	308,809	1,684,683
Other Services	353,865	1,914,758	263,618	2,532,240
Total	\$2,100,491	\$33,010,938	\$7,561,225	\$42,672,654

E. The Economic Impact of the College of Nursing

Table 18 presents total expenditures from all sources for the College of Nursing (CON) for FY2010.

Table 18. Estimated College of Nursing Total Revenues by Source, FY2010

1. University Spending	
Tuition and Fees	\$ 1,606,876
State Appropriations	3,696,344
Continuing Education Revenue	1,035,593
Grants, Contracts, Endowment, Other	2,177,533
University Spending Total	\$ 8,516,346
2. Student Spending	
Estimated Student Spending	\$ 4,506,044
Total Student Spending	\$ 4,506,044
4. Visitor Spending	
Estimated Visitor Spending	\$ 295,448
Visitor Spending Total	295,448
Estimated Total Direct Spending	\$13,317,838

Note: Data were unavailable for non-salary faculty income, including honoraria, speaking fees, patent income, book royalties, etc. As such, the expenditure figures presented here may be understated.

Total Impact

Expenditures from all sources in Table 18 totals over \$13.3 million in direct economic impact on the state's economy. As shown in Table 19, CON total expenditures from all sources is estimated to have resulted in an indirect output impact of over \$17.7 million, for a total impact of more than \$31.0 million in output, supporting a total of 286 jobs and total earnings of more than \$9.9 million.

Table 19. Estimated Economic Impact of UTHSC Nursing, FY2010

Category	Direct Expenditures	Impacts		
		Output	Earnings	Employment
University Spending	\$8,516,346	\$21,140,977	\$7,259,333	213
Student Spending	4,506,044	9,213,999	2,444,201	65
Visitor Spending	295,448	665,600	\$198,330	9
Total Impact	\$13,317,838	\$31,020,576	\$9,901,864	286

Faculty, Student, and Staff Spending

As shown in Table 20, we estimated that CON faculty, students, and staff spent over \$7.5 million in the state's economy including over \$466,000 in charitable contributions, over \$649,000 on groceries and eating out, nearly \$379,000 on utilities, and over \$418,000 on retail purchases excluding food.

**Table 20. Estimated Direct Spending by the College of Nursing
Faculty, Staff, and Students, FY2010**

Category	Faculty	Staff	Students	Total
Rent, Lease, Mortgage Average	\$ 622,126	\$516,636	\$2,743,394	\$3,882,157
Contributions	169,681	96,050	200,622	466,353
Utilities	98,576	46,742	233,406	378,725
Food at Home	106,930	41,662	278,292	426,884
Food Services and Drinking Places	91,893	24,895	105,482	222,270
Retail Trade Excluding Food	148,700	42,678	226,674	418,051
Transportation	257,301	89,420	276,048	622,769
Recreation Average	96,906	27,944	100,993	225,843
Medical Expenses	90,222	38,105	184,032	312,360
Other Services	340,840	56,904	157,101	554,845
Total	\$2,023,177	\$981,038	\$4,506,044	\$7,510,258

F. The Economic Impact of the College of Graduate Health Sciences

Table 21 presents total expenditures for the College of Graduate Health Sciences (CGHS) for FY2010.

**Table 21. Estimated College of Graduate Health Sciences
Total Expenditures by Source, FY2010**

1. University Spending	
Tuition and Fees	\$ 510,288
State Appropriations	1,173,831
Grants, Contracts, Endowment, Other	269,159
University Spending Total	\$1,953,278
2. Student Spending	
Estimated Student Spending	\$4,059,625
Total Student Spending	\$4,059,625
4. Visitor Spending	
Estimated Visitor Spending	\$ 67,763
Visitor Spending Total	67,763
Estimated Total Direct Spending	\$6,080,666

Note: Data were unavailable for non-salary faculty income, including honoraria, speaking fees, patent income, book royalties, etc. As such, the expenditure figures presented here may be understated.

Total Impact

Expenditures from all sources (Table 21) totaled over \$6.0 million in direct economic impact on the state's economy. As shown in Table 22, CGHS total expenditures from all sources was estimated to produce an indirect output impact of nearly \$7.2 million, for a total impact of more than \$13.2 million in output of the goods and services, supporting a total of 109 jobs and providing total earnings of almost \$3.9 million.

**Table 22. Estimated Economic Impact of UTHSC College of
Graduate Health Sciences, FY2010**

Category	Direct Expenditures	Impacts		
		Output	Earnings	Employment
University Spending	\$1,953,278	\$ 4,848,817	\$1,664,974	49
Student Spending	4,059,625	8,301,157	2,202,051	59
Visitor Spending	67,763	152,659	45,488	2
Total Impact	\$6,080,666	\$13,302,633	\$3,912,513	109

Faculty, Student, and Staff Spending

In Table 23, the economic sectors impacted by faculty, student, and staff spending are presented. In FY2010 it is estimated that CGHS faculty, students, and staff spent over \$4.7 million in the state's economy, including over \$241,000 in charitable contributions, more than \$406,000 on groceries and eating out, more than \$243,000 on utilities, and over \$248,000 on retail purchases excluding food.

**Table 23. Estimated Direct Spending by Graduate Health Sciences
Faculty, Staff, and Students, FY2010**

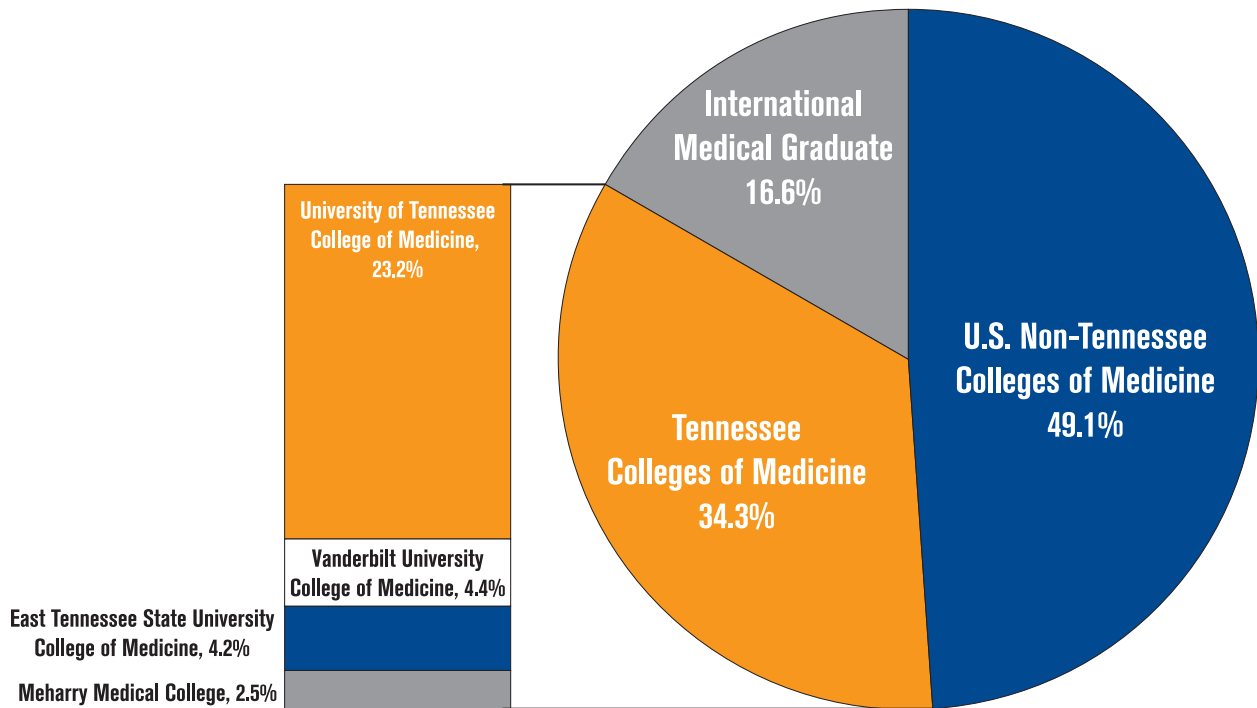
Category	Faculty	Staff	Students	Total
Rent, Lease, Mortgage Average	\$142,689	\$118,494	\$2,471,603	\$2,732,785
Contributions	38,917	22,030	180,746	241,693
Utilities	22,609	10,721	210,283	243,612
Food at Home	24,525	9,555	250,722	284,802
Food Services and Drinking Places	21,076	5,710	95,032	121,818
Retail Trade Excluding Food	34,105	9,788	204,217	248,110
Transportation	59,014	20,509	248,700	328,222
Recreation Average	22,226	6,409	90,988	119,623
Medical Expenses	20,693	8,740	165,800	195,233
Other Services	78,174	13,051	141,536	232,762
Total	\$464,028	\$225,007	\$4,059,625	\$4,748,660

VI. PHYSICIAN MANPOWER IMPLICATIONS

In addition to its economic impacts, the University of Tennessee Health Science Center has a substantial impact on the well-being of the citizens of Shelby County and the state of Tennessee through its role in educating and training health care manpower.

Charts 1 and 2 depict the colleges of medicine from which physicians practicing in Tennessee and in Shelby County graduated.^{7,8} In June 2010, 13,430 physicians were practicing in Tennessee (Chart 1). Of all physicians practicing in Tennessee, 4,604 (34.3 percent) were graduates of one of the 4 Tennessee colleges of medicine,⁹ and 3,113 (23.2 percent) were graduates of the University of Tennessee College of Medicine (UTCOM). As shown in the figures, UTCOM graduates comprised 23.2 percent of all Tennessee physicians and 66.7 percent of Tennessee physicians who graduated from any Tennessee medical college.

Chart 1. Distribution of Tennessee Physicians by College of Medicine Attended (n = 13,430)



Source: *Physician Masterfile*, American Medical Association, June 2010.

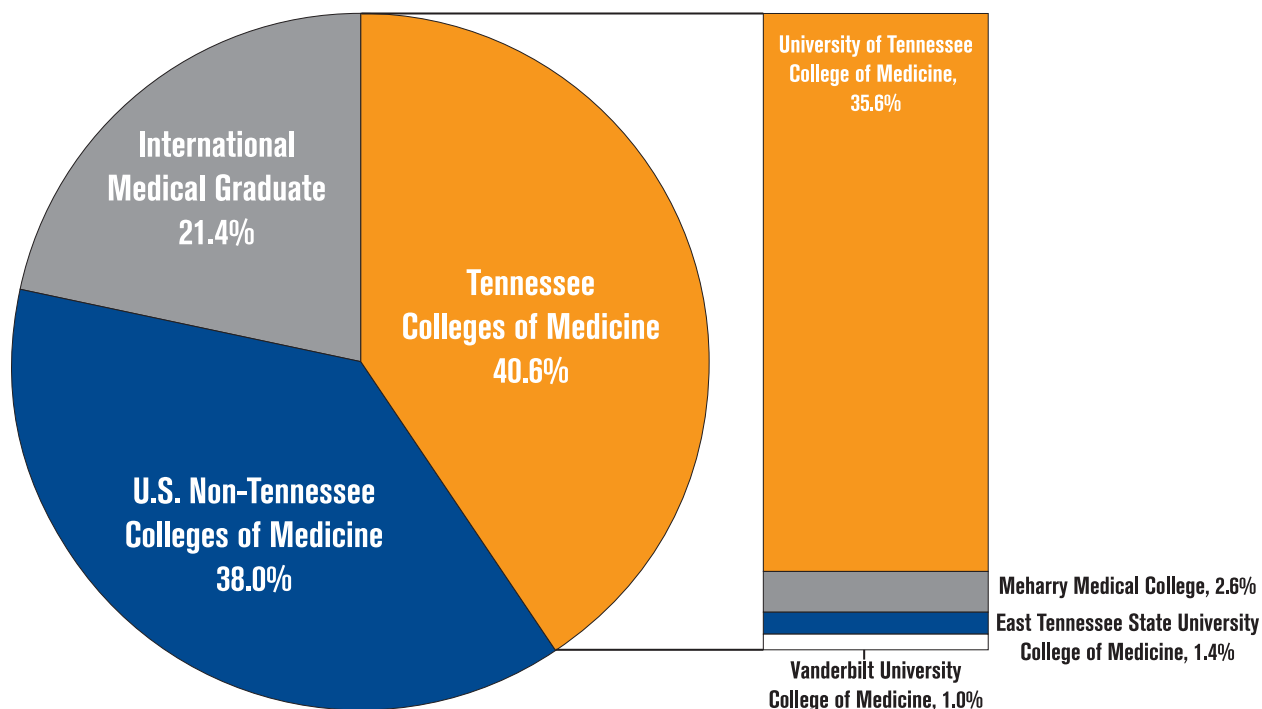
⁷Data from the *Physician Masterfile*, American Medical Association, June 2010.

⁸Comparable data are not available for graduates of the other UTHSC colleges and programs.

⁹These are East Tennessee State University College of Medicine, Meharry Medical College, the University of Tennessee College of Medicine, and Vanderbilt University College of Medicine.

Similar data are presented in Chart 2 for physicians practicing in Shelby County. Of the 2,380 physicians in the county, 846 (35.6 percent) graduated from the UTCOM, which accounted for 87.6 percent of the 966 of physicians in the county who graduated from any of the 4 Tennessee colleges of medicine.

Chart 2. Distribution of Shelby County Physicians by College of Medicine Attended (n = 2,380)

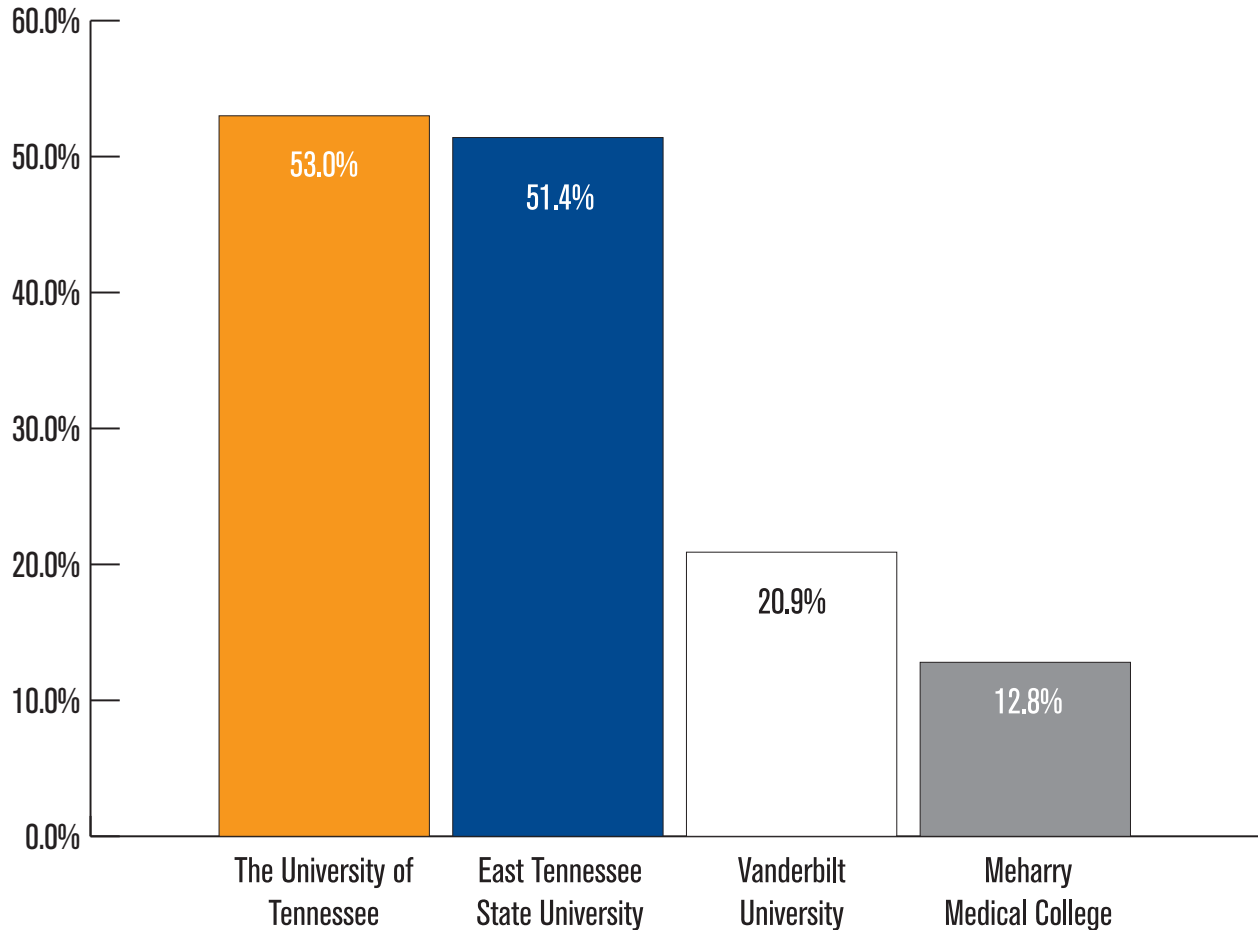


Source: *Physician Masterfile*, American Medical Association, June 2010.

The prime role of the UTCOM as a supplier of medical manpower for the state and for Shelby County is also shown in Chart 3. The figure depicts the proportion of graduates from each of the four Tennessee colleges of medicine who were practicing in Tennessee in June 2010. The percent of UTCOM graduates practicing in Tennessee (53.0 percent) was greater than for any of the other colleges of medicine in the state.

The UTHSC also provides graduate medical education (GME)—i.e., residency programs—in numerous specialties. In the 2010–2011 academic year, a total of 1,026 residents and fellows were trained in UTHSC-sponsored GME programs in Memphis, Jackson, Chattanooga, and Knoxville. These UTHSC-sponsored graduate medical education programs are far larger than the GME pro-

Chart 3. Percent of Graduates from Tennessee Colleges of Medicine Practicing in Tennessee



Source: *Physician Masterfile*, American Medical Association, June 2010.

grams of Vanderbilt (850), East Tennessee State University (245), and Meharry (96). UTHSC’s GME program exceeds the capacity of the other three medical schools in Tennessee in another important respect: the number of trainees who specialize in primary care, an area of practice that will play an increasingly critical role in the delivery of cost effective care in the near future. Currently, a total of 455 trainees in UTHSC-sponsored GME programs specialize in primary care, and this cohort is much larger than the size of similar cohorts at Vanderbilt (229), ETSU (184), and Mcharry (69), respectively. Most importantly, approximately 50.0 percent or more of the UTHSC-sponsored GME trainees stay in Tennessee to practice irrespective of where they attended medical schools.¹⁰ This

¹⁰The actual percentage may be even higher since the data analyzed by the authors include trainees who completed UTHSC training and stayed in Tennessee to practice as well as those who left for an out-of-state GME program for further training. Some of these who left Tennessee may eventually come back to Tennessee to practice but cannot be verified by the available data.

number of trainees is 20.0 percent higher than the average proportion of GME trainees who stay in Tennessee of the other three medical schools based on an analysis of the data abstracted from the American Medical Association's Physician Master File.

VII. CONCLUSIONS

The University of Tennessee Health Science Center (UTHSC) is Tennessee's flagship statewide academic health system, offering three undergraduate programs, more than twenty graduate degrees, and three professional programs. In addition to its education, research, and patient care roles, UTHSC is a major contributor to the economy of the state. In FY2010, UTHSC contributed:

- A total of \$970 million of direct spending to stimulate the state economy.
- When multiplier effects were taken into account, the total economic contribution of UTHSC amounted to more than \$2.3 billion of total output for Tennessee's economy.
- UTHSC received \$126.6 million of state appropriation or "orange dollars" in FY2010. For every dollar of state appropriation, the university and its related operations contributed more than \$18 of total economic output.
- UTHSC was directly and indirectly responsible for an estimated total of 21,096 jobs in Tennessee which, in turn, generated a total of more than \$804 million in earnings, equating to an average of \$38,140 per job.
- Memphis, the main campus of UTHSC, contributed the most in total economic impact representing about 73.8 percent of the total impact. The other 2 major locations, Knoxville and Chattanooga, represent 17.3 percent and 8.9 percent, respectively, of the total.
- Two-thirds of Tennessee physicians who graduated from Tennessee colleges of Medicine are UTHSC graduates.
- Of the 4 colleges of medicine in Tennessee, UTHSC has the highest percentage of graduates (53.0 percent) practicing in Tennessee taking care of the patient needs of fellow Tennesseans.
- The University of Tennessee Health Science Center has the largest Graduate Medical Education program in the state training, for example, 1,026 interns, residents and fellows in the 2010–2011 academic year.
- Four hundred fifty-five of the total trainees in 2010–2011 specialized in primary care, an area of practice that will play an increasingly critical role in the delivery of cost-effective care in the near future.

- Fifty percent or more of the UTHSC-sponsored GME trainees stay in Tennessee to practice irrespective of where they attended medical schools.

APPENDIX I: SURVEY RESULTS

Faculty Survey (n = 307)

Within UTHSC, with which college are you primarily affiliated?

College	Faculty	Percent
Central Administration	4	1.3%
College of Allied Health Sciences	34	11.1%
College of Dentistry	23	7.5%
College of Graduate Health Sciences	12	3.9%
College of Medicine	184	59.9%
College of Nursing	14	4.6%
College of Pharmacy	29	9.4%
Other	7	2.3%
Total Respondents	307	100.0%

Including yourself, how many people live in your household?

2.66

Do you own, rent, or lease your living quarters?

	Faculty	Percent
Lease	0	0.0%
Other	0	0.0%
Own	272	93.2%
Rent	20	6.8%
Total	292	100.0%

On average, how much money do you spend locally each month?

\$4,778.54

How much do you spend on rent, lease, or mortgage payments each month?

\$1,469.40

On average how much do you spend each month on contributions to charitable and/or religious organizations?

\$400.77

On average how many associates, friends, and relatives come from outside of Tennessee to visit you each month?

1.25

What is their average length of stay (in days)?

2.58

Where do they usually stay when they come to town?

	Faculty	%
Hotel	27	14.9%
In My Household	149	82.3%
Other	5	2.8%
Total	181	100.0%

Student Survey (n = 422)

Within UTHSC, with which college are you primarily affiliated?

College	Student	Percent
College of Allied Health Sciences	53	12.6%
College of Dentistry	20	4.8%
College of Graduate Health Sciences	58	13.8%
College of Medicine	198	47.0%
College of Nursing	26	6.2%
College of Pharmacy	62	14.7%
Other	4	1.0%
Total Respondents	421	100.0%

What degree are you seeking?

Degree	Student	Percent
AUD	1	0.2%
BSMT	4	1.0%
BSN	3	0.7%
CNL	6	1.5%
DDS	19	4.7%
DNP	12	2.9%
DPT	9	2.2%
MD	181	44.4%
MOT	3	0.7%
MSCLS	3	0.7%
MSN	1	0.2%
Other	47	11.5%
PhD	61	15.0%
PharmD	57	14.0%
ScDPT	1	0.2%
Total	408	100.0%

Including yourself, how many people live in your household?

2.5 (average for all students, regardless of living with other UTHSC students)

Does this number include other UTHSC students?

Students	Frequency	% of Total
No	314	74.4%
Yes	108	25.6%
Total	422	100.0%

How many UTHSC students in total live in your household?

3.4 (average number of residents who live with other UTHSC students)

Do you own, rent, or lease your living quarters?

	Student	%
Lease	10	2.5%
Other	16	4.0%
Own	111	27.8%
Rent	263	65.8%
Total	400	100.0%

On average, how much money do you spend locally each month?

\$1,162.55

How much do you spend on rent, lease, or mortgage payments each month?

\$707.79

On average how much do you spend each month on contributions to charitable and/or religious organizations?

\$51.76

On average how many associates, friends, and relatives come from outside of Tennessee to visit you each month?

0.91

What is their average length of stay (in days)?

1.53

Where do they usually stay when they come to town?

	Student	%
Hotel	22	9.6%
In My Household	194	84.7%
Other	13	5.7%
Total	229	100.0%

On average, how many months of the year do you live in Tennessee?

11.5

Staff Survey (n = 421)

Within UTHSC, with which college are you primarily affiliated?

College	Staff	Percent
Central Administration	81	19.9%
College of Allied Health Sciences	15	3.7%
College of Dentistry	23	5.6%
College of Graduate Health Sciences	15	3.7%
College of Medicine	155	38.0%
College of Nursing	14	3.4%
College of Pharmacy	21	5.1%
Other	84	20.6%
Total Respondents	408	100.0%

Including yourself, how many people live in your household?

2.65

Do you own, rent, or lease your living quarters?

	Staff	%
Lease	2	0.5%
Other	8	2.0%
Own	306	78.3%
Rent	75	19.2%
Total	391	100.0%

On average, how much money do you spend locally each month?

\$1,793.03

How much do you spend on rent, lease, or mortgage payments each month?

\$944.25

On average how much do you spend each month on contributions to charitable and/or religious organizations?

\$175.55

On average how many associates, friends, and relatives come from outside of Tennessee to visit you each month?

1.02

What is their average length of stay (in days)?

1.85

Where do they usually stay when they come to town?

	Staff	%
Hotel	25	11.8%
In My Household	172	81.5%
Other	14	6.6%
Total	211	100.0%

APPENDIX II: IMPACT CALCULATIONS

The Impact of Budgeted UTHSC Operations

Normal, budgeted daily operations are what most people think of when it comes to university operations. However, the daily operations of UTHSC and institutions like it are quite complex. Notably, only 31.4 percent of UTHSC’s total expenditures comes from state appropriations. Also, 68.6 percent of UTHSC’s total expenditures comes from other sources, including more than \$178.4 million in grants and contracts, over \$55.0 million in tuition and fees, and nearly \$25.2 million from the provision of clinical services. In the absence of UTHSC, tuition and fees, continuing education expenditures, grants, contracts and endowment expenditures, and a substantial portion of clinical services expenditures would disappear from the Tennessee economy. As shown in Table AII-1, the economic impact from university spending was estimated at over \$953.4 million in output (the production of goods and services), more than \$327.4 million in total earnings, while supporting approximately 9,587 jobs.

Table AII-1. Economic Impact of UTHSC University Spending, FY2010

Category	Direct Expenditures	Impacts		
		Output	Earnings	Employment
Tuition and Fees	\$55,040,679	\$136,632,982	\$46,916,675	1,374
State Appropriations	126,611,727	314,300,951	107,923,836	3,160
Continuing Education Revenue	2,862,709	7,106,389	2,440,173	71
Grants, Contracts, Endowment, Other	178,424,933	442,922,054	152,089,413	4,453
Clinical Services	25,194,256	62,542,221	21,475,584	629
Total Impact	\$388,134,304	\$963,504,596	\$330,845,681	9,687

The Impact of UTHSC Faculty Clinical Practices

Many UTHSC faculty members also work in clinical practices outside the university spending of the institution, serving thousands of patients across the state. While not shown in detail, there are two parts to clinical practice operations expenditures: physician payments and hospital payments. Physician payments account for approximately 40.0 percent¹ of clinical practice expenditures while hospital payments account for the remaining 60.0 percent. In FY2010, faculty clinical practice ex-

¹Cyril F. Chang, “Economic Impacts of Methodist Le Bonheur Healthcare,” a special report prepared by the Methodist Le Bonheur Center for Healthcare Economics at the University of Memphis, February 20, 2009. Using this ratio and expenditures data from University of Tennessee Medical Group (Memphis), we estimated direct, Memphis-based UTHSC faculty generated clinical practice expenditures at nearly \$349.0 million. Data for faculty generated clinical practice expenditures in Knoxville and Chattanooga were unavailable and, therefore, were estimated using the ratio of local faculty to Memphis-based faculty.

penditures accounted for nearly \$1.25 billion in output and over \$443.3 million in earnings while supporting approximately 10,447 jobs.

Table AII-2. Economic Impact of UTHSC Faculty Clinical Practices on Tennessee in 2010 Dollars

Category	Direct Expenditures	Impacts		
		Output	Earnings	Employment
Memphis	\$348,970,488	\$822,889,858	\$292,454,717	6,891
Knoxville	115,194,142	271,633,545	96,538,450	2,275
Chattanooga	64,857,206	152,936,534	54,353,581	1,281
Total Impact	\$529,021,835	\$1,247,459,937	\$443,346,749	10,447

The Impact of Students

As discussed previously, student spending was measured using data gathered through an online survey process combined with data from the Consumer Expenditure Survey produced by the U.S. Bureau of Labor Statistics. Student spending for FY2010 was estimated at over \$39.4 million. In the absence of UTHSC, this amount is money that would leave the state's economy as most of these students would likely have to attend an out of state university for similar educational opportunities. As shown in Table AII-3, student expenditures are spread across the state's economy in all industries. The total economic impact from UTHSC student spending in Tennessee was estimated at nearly \$80.6 million in output (the production of goods and services), almost \$21.4 million in total earnings while supporting approximately 568 jobs.

Table AII-3. The Economic Impact UTHSC of Student Spending on Tennessee, FY2010

Category	Faculty	Staff	Students	Total
Rent, Lease, Mortgage Average	\$23,994,081	\$46,862,840	\$11,574,745	259
Contributions	1,754,664	4,276,292	1,403,029	47
Utilities	2,041,403	3,492,229	752,053	14
Food	3,356,538	7,576,382	2,234,667	83
Retail Trade	1,982,517	4,311,578	1,265,837	41
Transportation	2,414,352	5,163,575	1,399,359	42
Recreation Average	883,300	2,070,013	638,096	24
Medical Expenses	1,609,568	3,774,115	1,228,905	28
Other Services	1,374,022	3,059,809	880,610	30
Total	\$39,410,445	\$80,586,831	\$21,377,301	568

The Impact of Visitors to Faculty, Staff, and Students

Throughout the course of the year, faculty members and students often have visitors from out of town. Some of these visitors stay in local hotels, while others stay with students or faculty members. Regardless of where they stay, visitors also bring an economic impact that is in addition to the impact of direct spending by faculty members and students. Using responses to survey questions regarding visitors (how many, length of stay, where they stayed) combined with visitor spending information from the Memphis Convention and Visitors Bureau (February 2011), we were able to estimate total UTHSC visitor expenditures for FY2010 at just under \$13.5 million. These expenditures translate into a total of \$30.3 million in output and just over \$9.0 million and earnings while supporting 393 jobs. Table AII-4 presents the multiplier impacts of UTHSC visitors while Tables AII-5, AII-6, and AII-7 present preliminary and supporting calculations of visitor spending.

Table AII-4. Multiplier Impacts of Visitors of UTHSC Faculty, Staff, and Students in 2010 Dollars

Category	Direct Expenditures	Impacts		
		Output	Earnings	Employment
Hotels and Other Lodging Places	\$1,595,350	\$3,493,696	\$1,044,295	32
Eating and Drinking Places	5,512,498	14,303,005	4,263,851	195
Miscellaneous Retail and Services	6,357,270	12,538,146	3,730,782	166
Totals	\$13,465,119	\$30,334,847	\$9,038,928	393

Table AII-5. Estimated Number of Visitors, FY2010

Category	Earnings	Employment
Faculty	1.25	24,120.00
Staff	1.02	25,434.72
Students	0.91	30,849.00
Total	—	80,403.72

Table AII-6. Total Visitors, Average Stay, Hotel Room Nights, and Total Visitor Days

Category	Per Year	Stay (Days)	Hotel Stay	Room Nights	Total Visitor Days
Faculty	24,120.00	2.58	3,593.88	9,272.21	62,229.60
Staff	25,434.72	1.85	3,789.77	7,011.08	47,054.23
Students	30,849.00	1.53	2,961.50	4,531.10	47,198.97
Totals	80,403.72	—	10,345.16	20,814.39	156,482.80

**Table AII-7. Total Spending by Visitors of
UTHSC Faculty, Staff, and Students,
FY2010**

Category	Daily Average Per Guest	Total
Lodging (for 20,814.39 Room Nights)	\$ 76.65	\$1,595,350.30
Food and Drinks	35.23	5,512,497.91
Retail Shopping	40.63	6,357,270.31
Total (Including Lodging)	\$152.50	\$13,465,118.52

Note: Total average per guest is from the Memphis Convention and Visitors Bureau (February 2011). The breakdown of spending amounts came from survey responses collected in an analysis of the economic impact of the Southern Festival of Books, conducted in Memphis in September 2004.