

# **THE ECONOMIC IMPACT OF THE UNIVERSITY OF TENNESSEE, SPACE INSTITUTE ON THE STATE OF TENNESSEE**

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Academic Year 2007-2008

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## Executive Summary

This study summarizes the estimated impacts of the University of Tennessee Space Institute (UTSI) on the Tennessee economy for Fiscal Year 2008 (FY08).<sup>1</sup> The economic impacts estimated in this study include income and jobs created by spending of the institute and its employees and students.

Tennessee's economy benefits from the presence of UTSI in several ways. First, the institute provides 192 faculty, staff, and student employees with salaries. UTSI's payroll for FY08, both salary and benefits, was \$8.9 million. Our estimate indicates that payroll spending impacts the state economy in the amount of \$17.9 million and helps create about 127 additional jobs.

Second, the institute spends money on goods and services in the state, which creates jobs and income. UTSI made \$1.3 million in non-payroll expenditures in FY08, which generated \$673,265 in income and created 20 jobs.

Lastly, spending by students generates significant economic activity in the state. We estimate student expenditures for FY08 to be approximately \$1.7 million, creating \$698,748 in income and creating 23 jobs.

Combining the effects of payroll (\$17.9 million), non-payroll (\$673,265), and student spending (\$698,748), we find that UTSI generates a total of \$19.3 million in income and creates 362 jobs for the state of Tennessee, including those currently on the institute's payroll. In addition, we estimate that \$1.7 million is generated in state and local tax revenue from the presence of the institute.

## I. Introduction

### *Background*

Established in 1964, UTSI is a graduate education and research institution located in Tullahoma, Tennessee near the United States Air Force Arnold Engineering Development Center (AEDC). UTSI supports AEDC through research and technology development projects and continuing education programs.

UTSI offers programs in aviation systems; electrical engineering and computer science; industrial and information engineering/engineering management; mathematics; materials science and engineering; mechanical, aerospace, and biomedical engineering; and physics. Distance learning is also offered with two off-campus master of science degree programs--engineering management and an aviation systems degree offered at naval bases in Maryland and California, which supports U.S. National Defense.

Nearly 1,500 graduate degrees have been awarded through the institute with many graduates achieving national fame as astronauts, company presidents, chief scientists, engineering managers, and renowned scholars and scientists.<sup>2</sup>

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<sup>1</sup> Fiscal Year 2008 begins on July 1, 2007 and ends on June 30, 2008.

<sup>2</sup> See <http://www.utsi.edu/AboutUTSI/> for more information.

*Summary of Results*

This study uses data from various administrative sources to estimate the statewide economic impact of UTSI. Table 1 summarizes the general findings. We estimate that the institute generates about 362 jobs and \$19.3 million in economic impacts to the state. In addition, the institute creates approximately \$1.7 million in state and local tax revenue.

**TABLE 1**  
**Summary of Economic Benefits of UTSI, FY08**

	<b>Amount</b>
Income Generated	\$19,291,899
Tax Revenue Generated	\$1,687,676
Employment Generated	362

Although our estimation of the economic impact of the institute on the state is significant, it is safe to assume that we are providing a conservative estimate since we do not include any economic impacts from visitor spending. Presumably, a significant amount of economic activity is generated through lodging and food expenses from visitors associated with UTSI conferences and events.

The study is organized as follows: in the second section, we introduce institute spending for FY08 and estimate the direct income associated with those expenses. In section three, we combine the indirect effects associated with spending by UTSI with the direct effects and estimate the total economic impacts from both income and employment. In section four, we estimate tax revenue created by the institute in FY08. Section five describes some qualitative benefits from UTSI. Section six highlights institute enrollment trends.

**II. Total In-State Expenditures for UTSI**

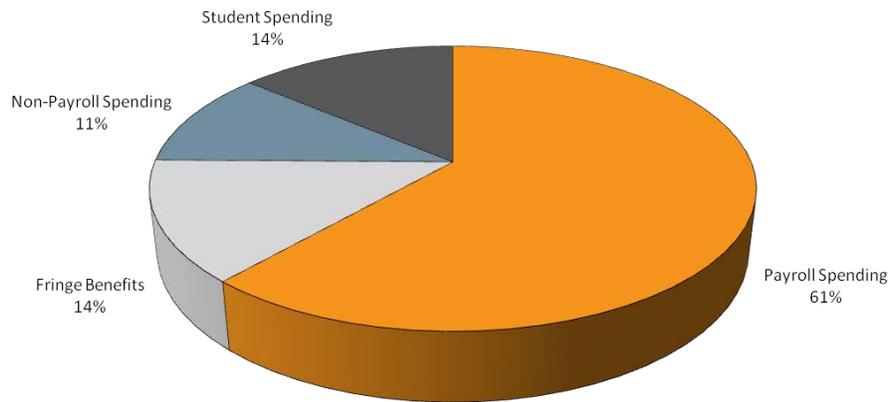
UTSI provides the state with economic benefits in several ways. The direct economic benefits are 192 people who are hired by UTSI and the associated income. Table 2 summarizes UTSI expenditures for FY08, including spending on payroll, employee benefits, non-payroll spending in-state, and student spending in-state. Combining these four components, the institute was responsible for about \$11.9 million in spending in FY08.

**TABLE 2**  
**UTSI Related In-State Expenditures, FY08**

	<b>Amount</b>
Payroll Spending	\$7,329,934
Fringe Benefits	\$1,630,009
Non-Payroll Spending	\$1,299,395
Student Spending	\$1,650,325
<b>Total FY08 In-State Expenditures</b>	<b>\$11,909,663</b>

The institute generates income through payment of \$7.3 million in faculty, staff, and student salaries. Employee fringe benefits, such as retirement and health insurance, cost the institute \$1.6 million in FY08. Together, salaries and benefits make up about 75 percent of all UTSI-related spending, as shown by Figure 1. Salaries and benefits are analyzed together in the estimates provided below.

**FIGURE 1**  
**UTSI Related In-State Expenditures, FY08**



Non-payroll expenditures made within the state on items like construction, utilities, maintenance services, and equipment also made up a significant portion of UTSI expenditures. In FY08, \$1.3 million was spent in-state on non-payroll goods and services, representing approximately 11 percent of all in-state institute spending.

Finally, there are impacts associated with off-campus student spending. In FY08, 231 students were enrolled at UTSI. We estimate that students spend \$1.7 million annually on transportation, off-campus living, and miscellaneous expenditures, which makes up about 14 percent of in-state, institute-related spending.

### III. Total Economic Impact on Tennessee from UTSI

#### *Estimated Income Impacts*

In addition to the income created through direct payroll spending, the institute also indirectly creates income for the state. These institute-related purchases of goods and services from vendors within the state are responsible for more jobs and income. Jobs and income are also created through the multiplier process - where money is spent and re-spent such that each dollar in expenditures can generate more than one dollar in economic activity.

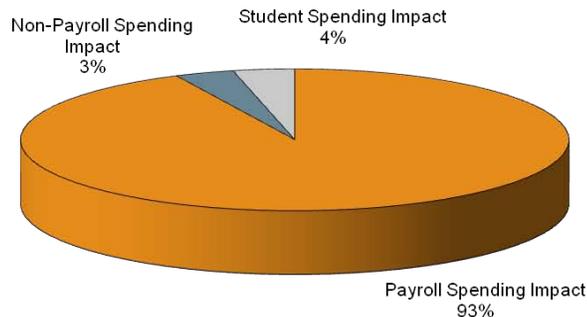
Table 3 outlines the economic impact from the three main sources of spending described above, Institute expenditures on payroll and benefits, non-payroll goods and services in-state, and student spending in-state. In FY08, payroll generated \$17.9 million in income, while \$673,265 was generated by non-payroll income, and \$698,748 from student spending. Combining all three effects, we estimate the overall economic impact of the institute to be \$19.3 million.

**TABLE 3**  
**UTSI Economic Impact by Source, FY08**

	<b>Amount</b>
Payroll Spending Impact	\$17,919,886
Non-Payroll Spending Impact	\$673,265
Student Spending Impact	\$698,748
<b>Total FY08 Income Benefit</b>	<b>\$19,291,899</b>

As illustrated by Figure 2, 93 percent of all income was created through payroll spending. Non-payroll spending and student spending generated approximately 3 percent and 4 percent of income, respectively.

**FIGURE 2**  
**UTSI Income Benefit, by Source, FY08**



*Estimated Employment Impacts*

When UTSI spends money on goods and services, many jobs are created in addition to the 192 employed by the institute in FY08. We estimate that an additional 170 jobs result from UTSI-related spending. Combining UTSI employment with jobs created, we estimate that the institute is responsible for a total of 362 jobs in the state.

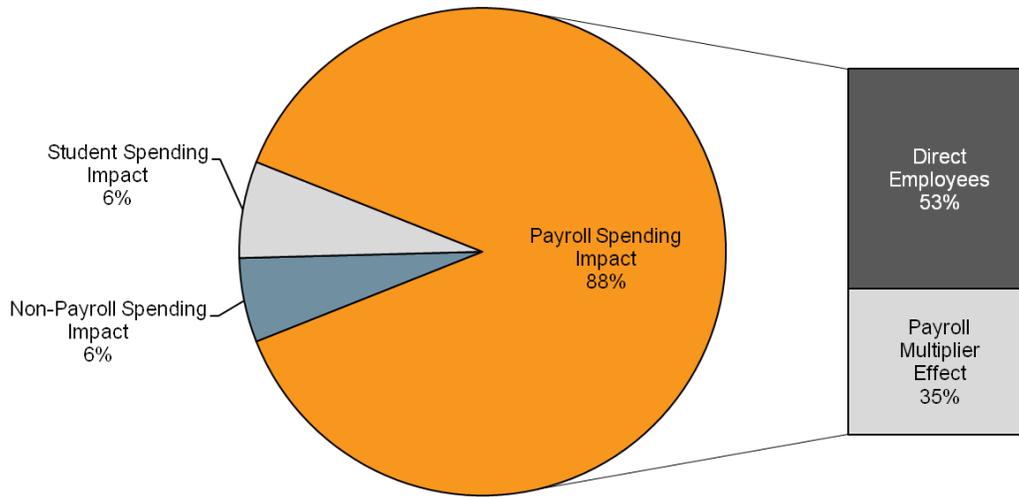
Table 4 summarizes the employment impacts for FY08. The payroll spending effect combines the 192 employees and another 127 that are generated when employees spend income on goods and services. Also, non-payroll expenditures made by the university created 20 jobs in-state. Student spending was responsible for 23 jobs.

**TABLE 4**  
**UTSI Employment Impact, by Source, FY08**

	<b>Amount</b>
Payroll Spending Impact	319
Direct Employees	192
Payroll Multiplier Effect	127
Non-Payroll Spending Impact	20
Student Spending Impact	23
<b>Total FY08 Employment Impact</b>	<b>362</b>

Of the total employment impact, 88 percent was due to payroll spending—53 percent UT Knoxville employees and 35 percent created by the payroll multiplier effect as shown by Figure 3. Non-payroll spending accounted for about 6 percent. Student spending generated about 6 percent of all UTSI-related jobs.

**FIGURE 3**  
**UTSI Employment Impacts, by Source, FY08**



#### IV. Tax Effects

UTSI also benefits the state through increased tax revenue. We estimate that the institute generates a total of \$1.7 million in state and local tax revenue—\$885,827 in sales tax revenue and \$801,850 in other tax revenue. Table 5 summarizes these results.

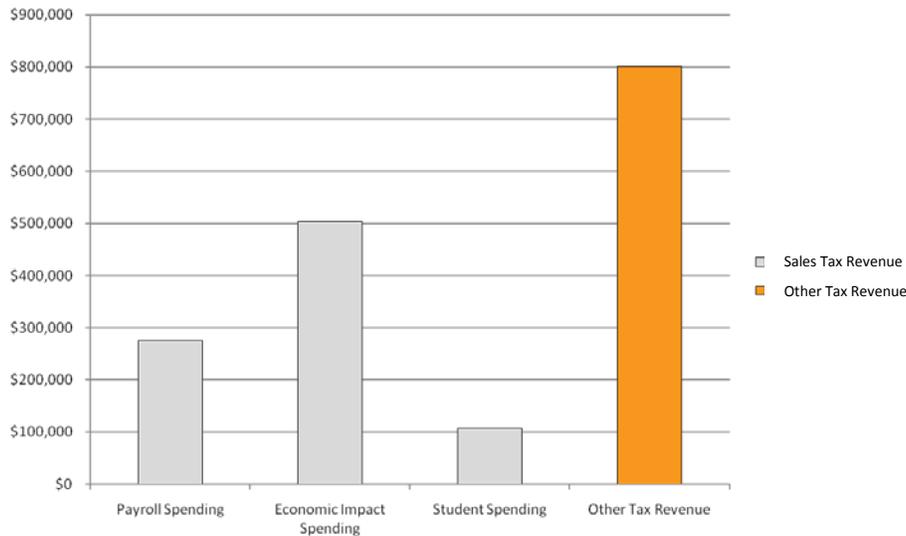
**TABLE 5**  
**State and Local Tax Revenue Generated by UTSI, by Source, FY08**

	<b>Amount</b>
Sales Tax Revenue	\$885,827
<i>Payroll Spending</i>	\$274,873
<i>Economic Impact Spending</i>	\$503,683
<i>Student Spending</i>	\$107,271
Other Tax Revenue	\$801,850
<b>Total FY08 State &amp; Local Tax Revenue Generated</b>	<b>\$1,687,677</b>

About \$274,873 in state and local sales tax revenue arises from UTSI employees spending the income that they earn. Another \$503,683 in sales taxes arises from spending of income generated by the institute. When students purchase goods and services, sales tax revenue rises by about \$107,271.

Other tax revenue, which includes all state and local taxes except for the sales tax, was approximately \$801,850 in FY08. Figure 4 provides a graphical representation of the estimated tax revenue generated.

**FIGURE 4**  
**State and Local Tax Revenue Generated by UTSI, FY08**



## V. Qualitative Impacts

There are significant qualitative benefits from UTSI that, though difficult to quantify, may be as important as or more important than the quantitative effects described above. These qualitative impacts include benefits from an educated workforce, distinguished research projects, and increased community engagement through an array of activities. A few examples are listed below, but these barely scratch the surface in describing the many qualitative benefits.

The state of Tennessee benefits from an educated workforce, including faculty and students who are currently enrolled at UTSI and retired faculty and alumni who reside or work in-state. Describing these impacts in detail would be beyond the scope of this study, but it is well-documented that there are substantial qualitative benefits that arise from an educated population/workforce.<sup>3</sup> Perhaps the most transparent of these benefits comes in the form of higher wages and lower unemployment rates for UTSI graduates.

Faculty and students enrolled in the institute often provide benefits that are fiscally immeasurable to the local community. For example, the faculty and students are involved in churches, schools, charities, and many other off-campus social events that greatly impact the local communities and the state.

In many cases, students and faculty members involved in local community organizations may be perceived as role models for younger Tennesseans. In addition, because the institute attracts such a

<sup>3</sup> Murray, M. N. (December 2007). *Education Crossroads*. Knoxville, TN: University of Tennessee, Center for Business and Economic Research.

diverse range of students and faculty, Tennesseans can discover a broad variety of cultural and social activities that would not otherwise prevail in the state.

### **VI. Growing Economic Impact**

As shown in Figure 5, UTSI has seen 6.9 percent annual growth since 2003. Growing student counts are helping expand the already large effect of UTSI.

**FIGURE 5**  
**UTSI Enrollment Trends**

