

Vital Stats

2015

VANDERBILT UNIVERSITY'S CONTRIBUTIONS
TO THE ECONOMIC VIBRANCY OF TENNESSEE



VANDERBILT  UNIVERSITY

Summary

Tennessee and the nation have realized enormous social and economic benefits from Vanderbilt University and Medical Center since the university's founding in 1873.

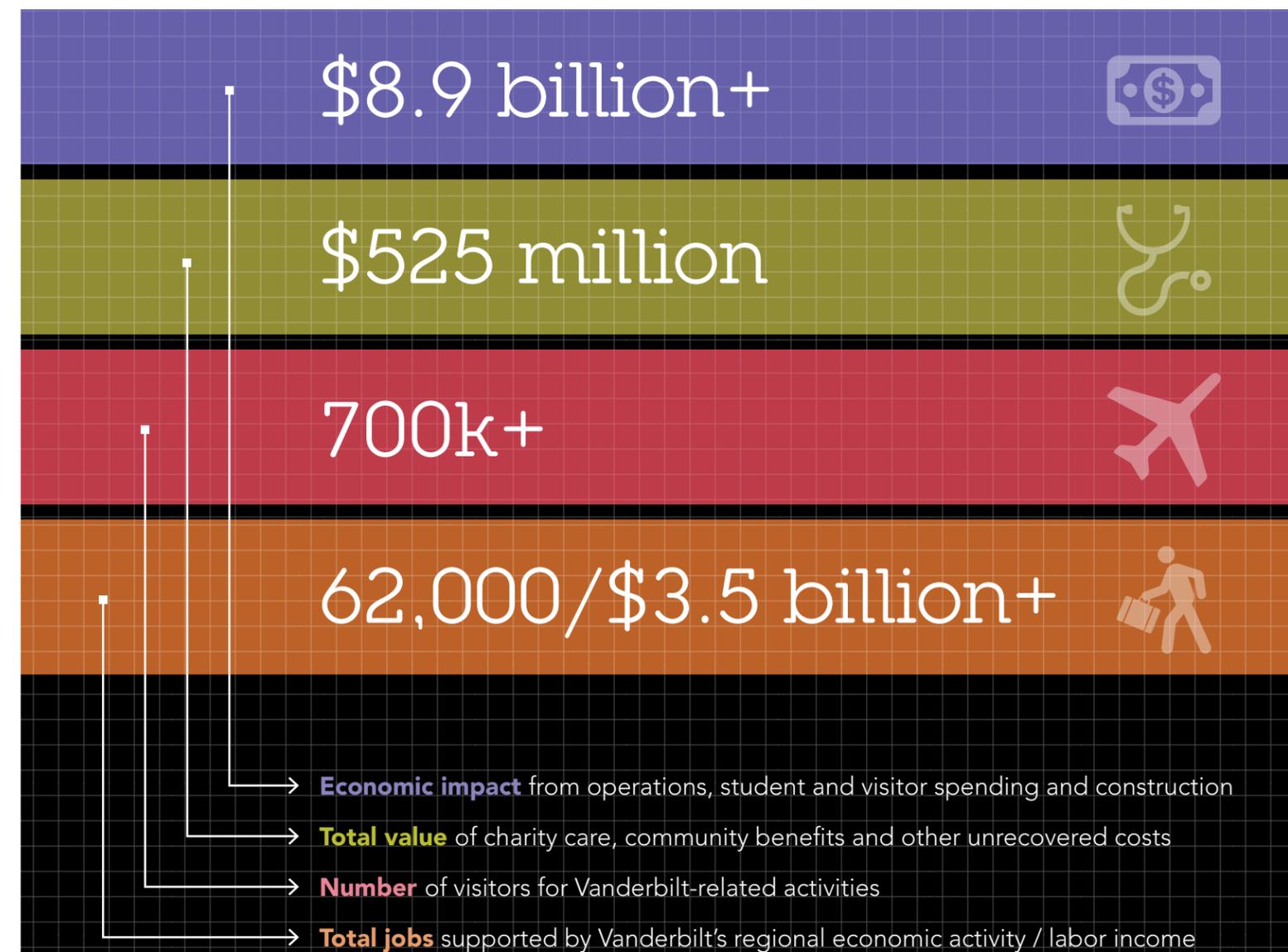
This presents itself in a number of ways. First, direct Vanderbilt spending on capital, faculty, staff and general procurement creates sales for firms throughout the local and state economies. Second, student spending off campus and out-of-town visitors to Vanderbilt bring additional money into Middle Tennessee businesses. Vanderbilt also plays an important role in economic development by providing an educated labor force, by contributing to the commercialization of academic research and by influencing the revitalization of parts of the community through the built environment, including nearby green spaces, housing and infrastructure such as roadways and utilities. Finally, students, faculty and staff of Vanderbilt contribute thousands of hours of community service each year, promoting health, literacy, education, culture and overall quality of life in the region. While not all of these benefits are measurable, the following findings illustrate Vanderbilt's importance:

- ★ Occupying more than **20 million** square feet in Nashville, Vanderbilt employs a total of just over **25,000** faculty, staff and medical professionals who teach **12,757** students. On the medical side, there were more than **2 million** visits last year, along with **\$568.1 million** in research expenditures and more than **\$525 million** in charity care, community benefits and other unrecovered costs.
- ★ Vanderbilt is the largest private employer in the Nashville region and the second largest private employer based in the state.
- ★ In 2014, Vanderbilt conferred **3,750** degrees and certificates. Since 2010, the university has awarded more than **18,350** degrees.
- ★ In 2014, Vanderbilt-related activity attracted more than **700,000** visitors.
- ★ Vanderbilt operations, along with student and visitor spending, generated an economic impact of **\$8.9 billion** in economic activity, approximately **62,000** jobs and more than **\$3.5 billion** in labor income, an impact that has more than doubled in the last 10 years. This translates into **\$225.9 million** in tax revenue for the state of Tennessee.

Economic Impact of Vanderbilt FY 2013-14

UNIVERSITY AND MEDICAL CENTER OPERATIONS	CONSTRUCTION SPENDING	STUDENT AND VISITOR	TOTAL
\$8,280,457,055 output	\$288,688,865 output	\$358,753,540 output	\$8,927,899,460 output
\$4,879,089,192 value added	\$157,418,564 value added	\$218,262,725 value added	\$5,254,770,481 value added
\$3,335,045,177 labor income	\$93,269,684 labor income	\$106,433,292 labor income	\$3,534,748,153 labor income
55,701 employment	2,409 employment	3,878 employment	61,988 employment

Source: TXP, Inc. Note: See pages 4–6 for definitions of economic impact terms use





Introduction

Vanderbilt University, located in Nashville, Tennessee, is a private research university and medical center offering a full range of undergraduate, graduate and professional degrees.

Founded in 1873, the school offers an invigorating atmosphere where students tailor their education to meet their goals and researchers collaborate to solve complex questions affecting health, culture and society.

Currently, Vanderbilt has an annual enrollment of approximately 6,800 undergraduate and 6,000 graduate and professional students. Consistently among the top-ranked universities in the nation, Vanderbilt draws students from all 50 states and more than 90 countries. Vanderbilt undergraduates can pursue one or more of 70 majors in four undergraduate schools and colleges: the College of Arts and Science, the School of Engineering, Peabody College of education and human development and the Blair School of Music. A robust set of graduate programs are also offered by the undergraduate schools and colleges. Vanderbilt has six graduate and professional schools, including the Divinity School, Graduate School, Law School, School of Medicine, School of Nursing and Owen Graduate School of Management.

As an independent, privately supported university employing approximately 4,000 full- and part-time faculty and 21,000 full- and part-time staff, Vanderbilt is the largest private employer in the Nashville area and the second largest private employer based in the state. Not only do Vanderbilt operations have a significant economic impact, but its students and graduates increase the state's economic

development competitiveness and productivity by gaining knowledge, improving technical skills and commanding a higher salary when entering the job market. In spring 2014, 3,750 students earned undergraduate, graduate or professional degrees.

Vanderbilt University Medical Center also plays an important role in improving Tennessee's overall quality of life and economic vitality beyond its direct role in the economy. In fiscal year 2013-14, for example, the total value of charity care, community benefits and other unrecovered costs provided by Vanderbilt exceeded \$525 million.

A wide variety of visitors, including prospective students, parents, graduates, sports fans and business leaders, travel to Nashville to take advantage of conferences, alumni events, sporting events and medical services associated with Vanderbilt. Out-of-town visitors help support cultural institutions and entertainment attractions that improve the quality of life for local residents who do not directly interact with the university.

The purpose of this assessment is to quantify the total annual economic and tax revenue impact of Vanderbilt. Building upon existing studies and datasets, this analysis highlights the importance of Vanderbilt in terms of jobs, wages and taxes for fiscal year 2013-14.

Economic and Tax Revenue Impact of Vanderbilt

Vanderbilt has a strong impact on the economy, as the operations of the school support thousands of direct and indirect jobs.

Beyond these impacts, Vanderbilt plays an important role in regional economic development. Faculty and staff, for example, provide business support and other technical services to existing firms. In terms of job creation, patents and business start ups resulting from the commercialization of Vanderbilt academic research are sources of economic development throughout Tennessee. Students, faculty and staff of Vanderbilt also provide thousands of hours of community service each year, enhancing health, literacy, education, culture and overall quality of life.

When evaluating the economic impact of Vanderbilt, the challenge is to focus on core activities that are measurable while not overlooking important qualitative aspects. Some studies take a narrow approach that focuses on the operational impact of the institutions, while other analyses include a variety of impacts ranging from alumni income to estimating the media value of collegiate sports teams. This study takes a measured approach but does make some subjective decisions regarding inputs.

Vanderbilt's impact also includes the operations of the Medical Center. With 1,025 licensed hospital beds, the Medical Center's 3,300 faculty train approximately 2,300 health care professionals per year.

Focus on Technology Transfer and Commercialization

The role that Vanderbilt plays in technology-related entrepreneurship has grown substantially over the years, as the Vanderbilt Center for Technology Transfer and Commercialization (CTTC) reports that technology license agreements grew from 39 during 2010 to more than 100 last year. Key to carrying out CTTC's mission is the ability to form collaborative and professional relationships with

companies in a variety of industries, including space exploration, education, pharmaceuticals, health care/patient care, robotics, energy, environmental preservation, engineering and many more. The results are impressive. In addition to licensing technology and intellectual capital, the CTTC is currently tracking 32 existing startups that have a connection to Vanderbilt. These 32 companies collectively report that they employ at least 413 people at present. These are good jobs at good wages. Although specific salary information is not available, virtually all of these companies are technology or life sciences companies that require the services of highly skilled and trained professional and technical employees. Life Sciences Tennessee, a biotech trade group representing biotech employers in the state of Tennessee, has data that the average biotech worker makes approximately \$90,000 per year. Anecdotal information suggests that workers in the non-biotech startups earn wages that are considerably higher than the U.S. average as well.

Model Inputs and Assumptions

Normal Operations and Expenditures Associated with Vanderbilt University and Medical Center – During the 2013-14 academic year, normal operations spending totaled \$3.7 billion, the largest input to the economic impact model. The econometric model was adjusted for each institution based on the following inputs. Each segment, for instance, has a different spending pattern for faculty and a different average wage level.

- **Operations:** expenditures related to general operations and plant operations and maintenance;
- **Payroll:** salaries, wages and fringe benefits; and
- **Employment:** faculty and staff, including graduate teaching or research assistants.

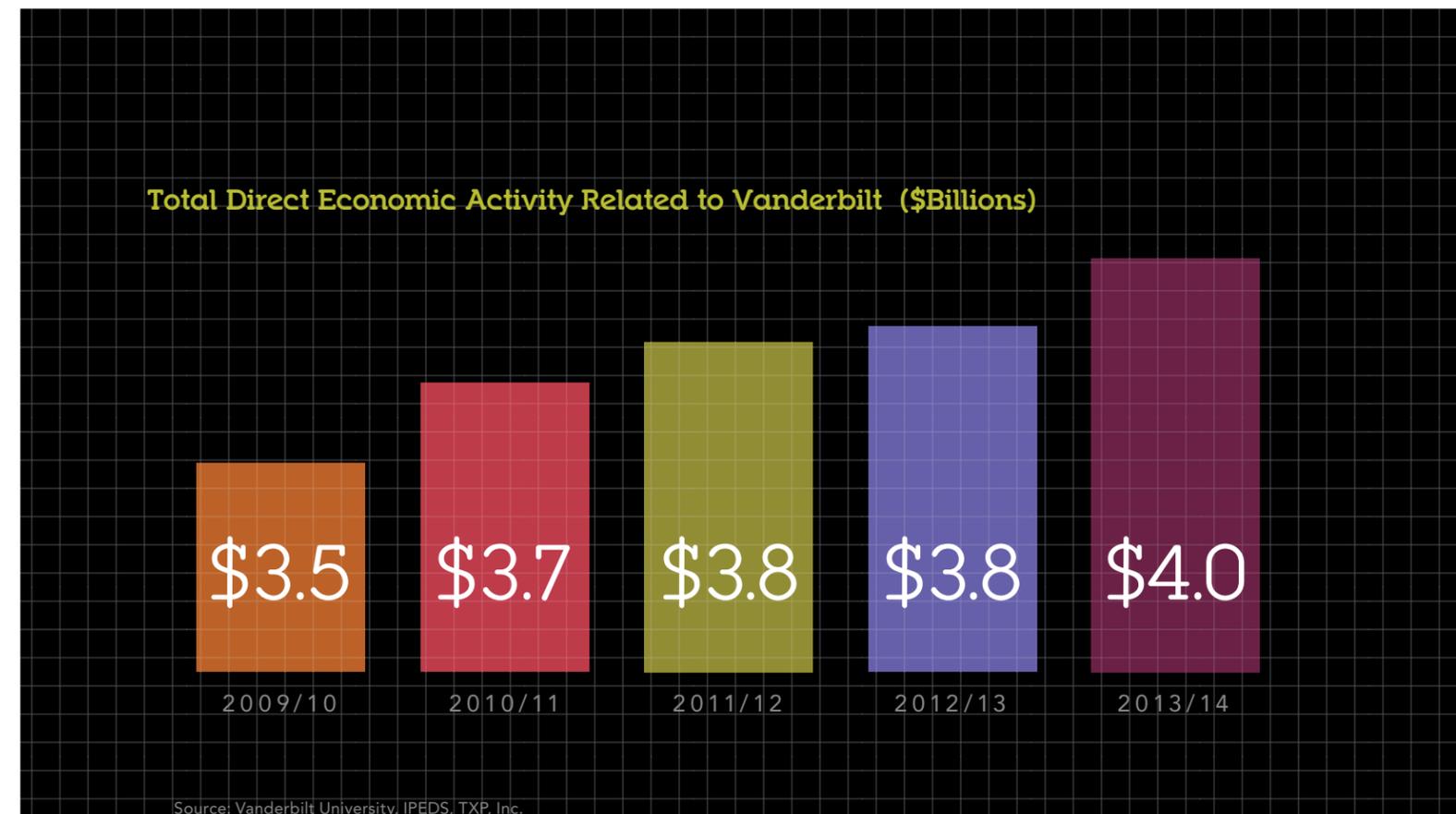
Construction Spending – spending on buildings and construction excluding equipment. This input has the greatest variation from year to year. Total annual construction spending in fiscal 2008-09 surpassed \$181.5 million, fell to \$86.6 million in fiscal 2011-12, then rose to \$126.0 million last year. In spite of these fluctuations, construction spending is included since it generates a significant level of economic activity.

Student and Visitor Spending – enrolled students (graduate and undergraduate) have a positive impact on the local economy by supporting businesses such as restaurants, music venues, rental housing and other retail establishments. Vanderbilt's academic quality and reputation attract students who might otherwise attend college elsewhere. At the same time, visitors from out of town also inject funds into the local economy; according to Vanderbilt, more than 700,000 parents and families, friends, conference attendees and fans at sporting events visit the area each year. Out-of-town visitor counts were combined with the average expenditure per visitor and length-of-stay statistics published by the Nashville Convention



and Visitors Corp. Together, students and visitors accounted for \$189.5 million in direct spending last year.

In total last year, Vanderbilt's direct spending footprint was \$4 billion, a figure that has grown 12.5 percent over the past five years.



Economic Impact Methodology

Economists use a number of statistics to describe regional economic activity.

Four common measures are “output,” which describes total economic activity and is generally equivalent to a firm’s gross sales or top-line; “value added,” which equals gross output of an industry or a sector less its intermediate inputs or purchases from other firms used in the production process; “labor income,” which corresponds to wages and benefits; and “employment,” which refers to jobs that have been created in the local economy.

In an input-output analysis of new economic activity, it is useful to distinguish three types of expenditure effects: direct, indirect and induced.

Direct effects + Indirect effects + Induced effects = Total impact

Changes associated with the immediate effects or final demand changes. Spending by students for entertainment, clothing, food, etc. off campus while they attend Vanderbilt are examples of direct effects.

Changes in backward-linked industries caused by the changing input needs of directly affected industries – typically, additional purchases to produce additional output. Satisfying the demand from students means that restaurants must purchase food, supplies and other services. These downstream purchases affect the economic output of other local merchants.

Changes in regional household spending patterns caused by changes in household income generated from the direct and indirect effects. The restaurant owner experiences increased income from student spending, as does the cleaning supplies outlet. Induced effects capture the way in which increased income is spent in the economy.

A multiplier reflects the interaction between different sectors of the economy. An output multiplier of 1.4, for example, means that for every \$1,000 injected into the economy, all other sectors produce an additional \$400 in output. The larger the multiplier, the greater the economic impact. Since the majority of Vanderbilt’s activity is in the Nashville area, TXP used the RIMS II input-output multipliers produced by the U.S. Bureau of Economic Analysis for the Nashville-Davidson-Murfreesboro-Franklin, MSA. This is a conservative approach, since MSA multipliers tend to be lower than statewide figures.

Economic Impact Results

FISCAL YEAR 2013-2014

Operations

\$3.7 billion direct operating expenditures
 \$2 billion wages
 \$8.3 billion economic output
 55,700 jobs
 \$3.3 billion labor income

See full chart on page 8

Construction

\$126 million construction, building and leasehold improvements
 \$288.7 million economic output
 2,400 total jobs supported
 \$93 million+ labor income

See full chart on page 9

Student & Visitor Spending

\$189.5 million off campus and visitor spending
 \$358.8 million economic output
 3,900 total jobs supported
 \$106 million+ labor income

See full chart on page 10

Total Economic Impact

\$8.9 billion+ aggregate economic impact
 62,000 total jobs supported
 \$3.5 billion+ labor income

See full chart on page 11

VANDERBILT ECONOMIC IMPACT FY 2013-14: **OPERATIONS**

VANDERBILT ECONOMIC IMPACT FY 2013-14: **CONSTRUCTION**

OUTPUT	VALUE ADDED	LABOR INCOME	EMPLOYMENT	OUTPUT	VALUE ADDED	LABOR INCOME	EMPLOYMENT
\$14,432,131 Agriculture	\$3,876,611	\$2,303,685	60	\$377,865 Agriculture	\$138,551	\$62,978	2
\$2,192,109 Mining	\$1,080,760	\$568,104	9	\$1,435,887 Mining	\$768,326	\$365,270	8
\$150,458,714 Utilities	\$75,729,389	\$33,066,449	286	\$2,531,696 Utilities	\$1,599,629	\$541,607	7
\$43,734,861 Construction	\$18,548,824	\$17,176,860	323	\$127,101,191 Construction	\$63,405,747	\$47,220,530	1,174
\$422,665,914 Manufacturing	\$115,204,184	\$77,626,823	1,412	\$27,899,033 Manufacturing	\$10,000,827	\$5,554,616	131
\$221,770,440 Wholesale Trade	\$129,649,732	\$74,150,384	992	\$10,076,400 Wholesale Trade	\$6,801,570	\$3,186,662	55
\$323,529,275 Retail Trade	\$183,203,938	\$116,506,156	3,366	\$16,411,937 Retail Trade	\$10,743,962	\$5,567,211	207
\$159,961,640 Trans./Warehouse	\$76,613,971	\$62,824,848	1,040	\$6,952,716 Trans./Warehouse	\$3,564,527	\$2,304,977	52
\$276,957,460 Information	\$128,986,296	\$66,153,610	1,088	\$8,224,862 Information	\$4,521,785	\$1,813,752	40
\$472,360,950 Finance/Insurance	\$241,709,996	\$140,583,514	2,408	\$15,618,420 Finance/Insurance	\$9,333,266	\$4,307,661	94
\$982,881,222 Real Estate	\$639,292,311	\$97,849,139	5,244	\$21,462,732 Real Estate	\$15,555,443	\$1,700,393	92
\$232,319,262 Prof./Tech. Services	\$136,394,208	\$114,636,840	1,542	\$13,200,084 Prof./Tech. Services	\$8,741,277	\$5,718,357	96
\$156,339,114 Mgmt. of Companies	\$89,886,461	\$69,584,438	794	\$3,967,583 Mgmt. of Companies	\$2,456,123	\$1,624,820	21
\$206,461,832 Admin. Services	\$123,570,072	\$98,978,176	3,267	\$5,428,661 Admin. Services	3,627,504	\$2,405,741	95
\$1,842,099,889 Educational Services	\$1,412,444,667	\$1,129,161,757	8,811	\$1,511,460 Educational Services	\$856,494	\$617,180	22
\$2,294,179,443 Health Care, Etc.	\$1,283,001,089	\$1,074,075,914	20,112	\$12,280,613 Health Care, etc.	\$7,532,109	\$5,718,357	121
\$41,023,822 Arts/Recreation	\$21,015,508	\$15,682,761	559	\$1,297,337 Arts/Recreation	\$780,921	\$466,034	22
\$54,095,900 Accommodation	\$29,439,066	\$17,114,324	469	\$1,637,415 Accommodation	\$1,058,022	\$491,225	18
\$144,563,158 Eating/Drinking	\$64,620,344	\$47,710,191	2,116	\$4,446,212 Eating/Drinking	\$2,317,572	\$1,385,505	80
\$238,429,919 Other Services	\$101,520,852	\$75,220,671	1,506	\$6,826,761 Other Services	\$3,488,954	\$2,090,853	60
N.A. Households	\$3,300,913	\$4,070,533	297	N.A. Households	\$125,955	\$125,955	12
\$8,280,457,055 Total	\$4,879,089,192	\$3,335,045,177	55,701	\$288,688,865 Total	\$157,418,564	\$93,269,684	2,409

Source: TXP, Inc.

Note: See page 4 for definitions of economic impact terms used.

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VANDERBILT ECONOMIC IMPACT FY 2013-14: **STUDENT AND VISITOR SPENDING**

VANDERBILT ECONOMIC IMPACT FY 2013-14: **TOTAL**

OUTPUT	VALUE ADDED	LABOR INCOME	EMPLOYMENT	OUTPUT	VALUE ADDED	LABOR INCOME	EMPLOYMENT
\$564,395 Agriculture	\$197,633	\$96,602	3	\$15,374,391 Agriculture	\$4,212,795	\$2,463,265	65
\$100,598 Mining	\$48,733	\$21,703	1	\$3,728,594 Mining	\$1,897,819	\$955,077	18
\$5,208,413 Utilities	\$3,338,775	\$1,133,821	14	\$158,198,823 Utilities	\$80,667,793	\$34,741,877	307
\$2,226,959 Construction	\$1,113,481	\$827,772	21	\$173,063,011 Construction	\$83,068,052	\$65,225,162	1,518
\$19,495,785 Manufacturing	\$6,425,108	\$3,489,830	84	\$470,060,732 Manufacturing	\$131,630,119	\$86,671,269	1,627
\$9,980,986 Wholesale Trade	\$6,739,334	\$3,151,240	54	\$241,827,826 Wholesale Trade	\$143,190,636	\$80,488,286	1,101
\$21,344,721 Retail Trade	\$13,987,551	\$7,247,203	270	\$361,285,933 Retail Trade	\$207,935,451	\$129,320,570	3,843
\$8,007,701 Trans./Warehouse	\$4,520,289	\$3,041,709	65	\$174,922,057 Trans./Warehouse	\$84,698,787	\$68,171,534	1,157
\$14,457,455 Information	\$7,798,021	\$3,439,658	78	\$299,639,777 Information	\$141,306,102	\$71,407,020	1,206
\$24,317,722 Finance/Insurance	\$14,345,897	\$6,697,123	144	\$512,297,092 Finance/Insurance	\$265,389,159	\$151,588,298	2,646
\$48,736,338 Real Estate	\$33,551,037	\$5,782,458	205	\$1,053,080,292 Real Estate	\$688,398,791	\$105,331,990	5,541
\$12,383,955 Prof./Tech. Services	\$8,525,625	\$5,738,682	102	\$257,903,301 Prof./Tech. Services	\$153,661,110	\$126,093,879	1,740
\$9,989,147 Mgmt. of Companies	\$6,198,367	\$4,090,080	54	\$170,295,844 Mgmt. of Companies	\$98,540,951	\$75,299,338	869
\$8,602,221 Admin. Services	\$5,609,187	\$3,662,589	147	\$220,492,714 Admin. Services	\$132,806,763	\$105,046,506	3,509
\$2,245,860 Educational Services	\$1,282,630	\$915,955	33	\$1,845,857,209 Educational Services	\$1,414,583,791	\$1,130,694,892	8,866
\$18,274,095 Health Care, etc.	\$11,206,974	\$8,493,259	181	\$2,324,734,151 Health Care, etc.	\$1,301,740,172	\$1,088,287,530	20,414
\$30,307,801 Arts/Recreation	\$21,006,848	\$11,169,647	757	\$72,628,960 Arts/Recreation	\$42,803,277	\$27,318,442	1,338
\$67,000,529 Accommodation	\$43,361,106	\$20,027,318	743	\$122,733,844 Accommodation	\$73,858,194	\$37,632,867	1,230
\$45,477,789 Eating/Drinking	\$23,666,526	\$14,159,194	819	\$194,487,159 Eating/Drinking	\$90,604,442	\$63,254,890	3,015
\$10,031,070 Other Services	\$5,154,286	\$3,062,132	85	\$255,287,750 Other Services	\$110,164,092	\$80,373,656	1,651
N.A. Households	\$185,317	\$185,317	18	N.A. Households	\$3,612,185	\$4,381,805	327
\$358,753,540 Total	\$218,262,725	\$106,433,292	3,878	\$8,927,899,460 Total	\$5,254,770,481	\$3,534,748,153	61,988

Source: TXP, Inc.

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State of Tennessee Tax Revenue Impact

The most complex part of any economic impact study is to evaluate the tax revenue implications in terms of return on investment (ROI) and net fiscal impact.

For a single business or industry sector, the tax revenue calculations are straightforward. The public sector costs, such as those for K-12 education and public safety, however, are more subjective based on location, existing infrastructure, workers drawn to the region because of the project and wage levels. Too often, the tax revenue estimates are overly aggressive to show a positive return.

As a not-for-profit, Vanderbilt is not subject to state and local taxes. However, tax revenue does accrue from activity associated with the indirect and induced economic effects described and measured below. To provide an “order of magnitude” estimate for state tax revenue attributable to Vanderbilt, the analysis used the ratio of state government tax collections to state GDP. Two datasets were used to derive the ratio: 1) U.S. Department of Commerce Bureau of Economic Analysis GDP estimates by metropolitan area; and 2) the U.S. Census Bureau State Government Tax Collections

(STC) Report. A brief description of the STC data collection methodology follows:
 In this survey, “taxes” are defined as all compulsory contributions exacted by a government for public purposes, except employer and employee assessments for retirement and social insurance purposes, which are classified as insurance trust revenue. Outside the scope of this collection are data on the unemployment compensation “taxes” imposed by each of the state governments. However, all receipts from licenses and compulsory fees, including those that are imposed for regulatory purposes as well as those designated to provide revenue, are included.

Over the past six years, the average state tax revenue as a percent of state GDP was 4.3 percent. Applying this percentage to total value added (or GDP) attributable to Vanderbilt’s activities, the state received approximately \$225.6 million in tax revenue for fiscal year 2013-14.

Tennessee Tax Revenue as a Percent of State GDP (\$Billions)

	TAX REVENUE (\$M)	GDP (\$M)	TAX REV AS % GDP
2008	\$11.54	\$249.62	4.6%
2009	\$10.43	\$247.47	4.2%
2010	\$10.51	\$253.99	4.1%
2011	\$11.24	\$264.94	4.2%
2012	\$12.02	\$280.49	4.3%
2013	\$12.37	\$287.63	4.3%

Source: U.S. Department of Commerce Bureau of Economic Analysis and U.S. Census Bureau

Conclusion

Vanderbilt is a pillar of the local and state economy, as tens of thousands of Tennesseans are employed, directly or indirectly, because of its presence.

However, the impact extends far beyond these calculations, as the university has a direct role in creating new products and companies. For example, over the past decade, Vanderbilt researchers and their innovations have helped to position the university as a world leader in numerous medical research sectors, such as biomedical informatics, medical imaging, personalized medicine and drug discovery and development. The results are impressive: 1,523 inventions, 556 licenses, 273 patents, \$95.8 million in revenue and 32 startups have been identified.

More broadly, Vanderbilt is essential to the functioning of the modern economy in Tennessee and the nation as a whole. Traditional economic development focuses on attracting and retaining new production facilities or company headquarters. While these elements remain a crucial piece of the puzzle, other factors play an increasing role in the mix – namely, a highly capable workforce, innovation and entrepreneurship, clusters in knowledge industries and superior quality of life. Vanderbilt makes integral contributions to all of these factors each year, and the impact is growing. Said slightly differently, the principal determinant of economic success in a modern economy is the ability to acquire, process and apply knowledge. Vanderbilt is a “factory” where this key element of the state’s (and nation’s) comparative advantage is honed, both in terms of preparing the future labor force and via research that ultimately leads to new or improved products and services. Tennessee remains fortunate to have such a strong asset in its economic development portfolio.



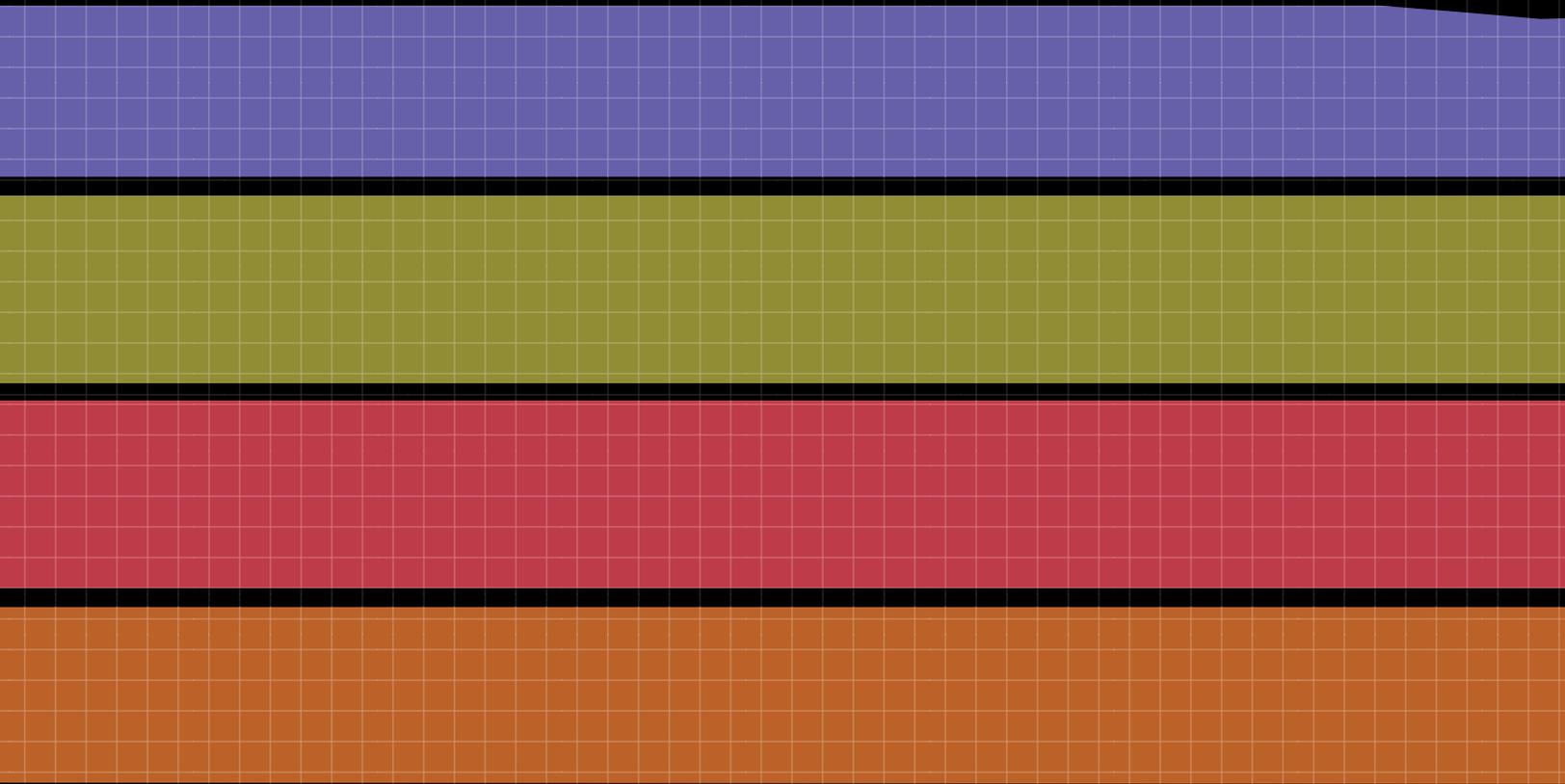
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