Tennessee Graduate Schools: Building the Workforce for the Future

Tennessee Conference of Graduate Schools

2/8/2017

Why Tennessee Needs to Support Graduate Education

- **Given:** Individuals in Tennessee with a graduate education earn more than those with a bachelor's alone or no college degree.
- **Given:** Tennessee's demand for workers with graduate, doctoral and professional degrees is projected to grow by 18% by 2022.
- Tennessee graduate degree production is insufficient to meet labor force demands.
- Tennessee lags in total higher education R&D expenditures, which drives graduate education.
- Modest increases in graduate education will return billions in increased earnings and tax revenue to Tennessee.

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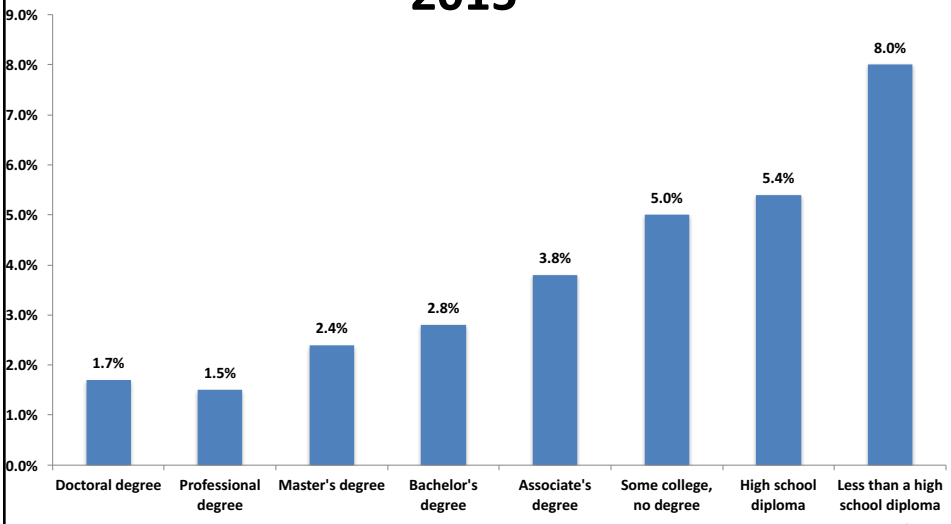
Unemployment Rate by Educational Attainment in the US Ages 25 and Over, 2015



Source: US Bureau of Labor Statistics, Current Population Survey

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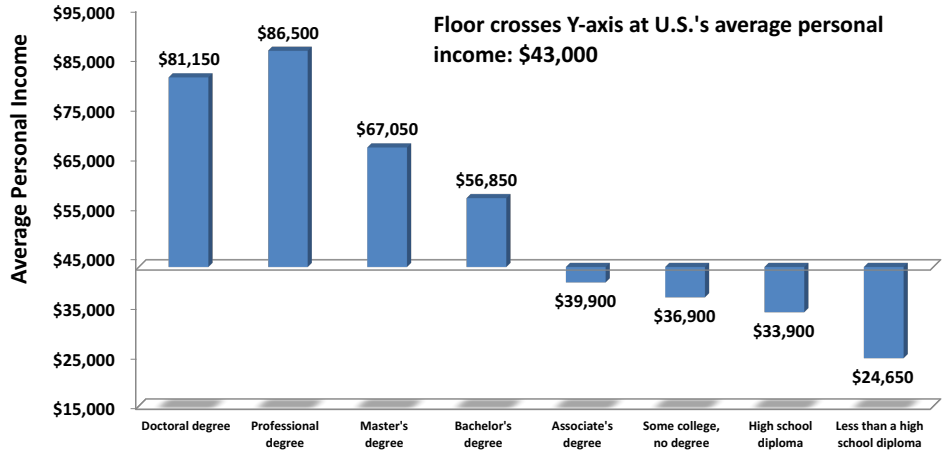
Average Personal Income by Educational Attainment in the US Ages 25 and Over, 2015



Source: US Bureau of Labor Statistics, Current Population Survey

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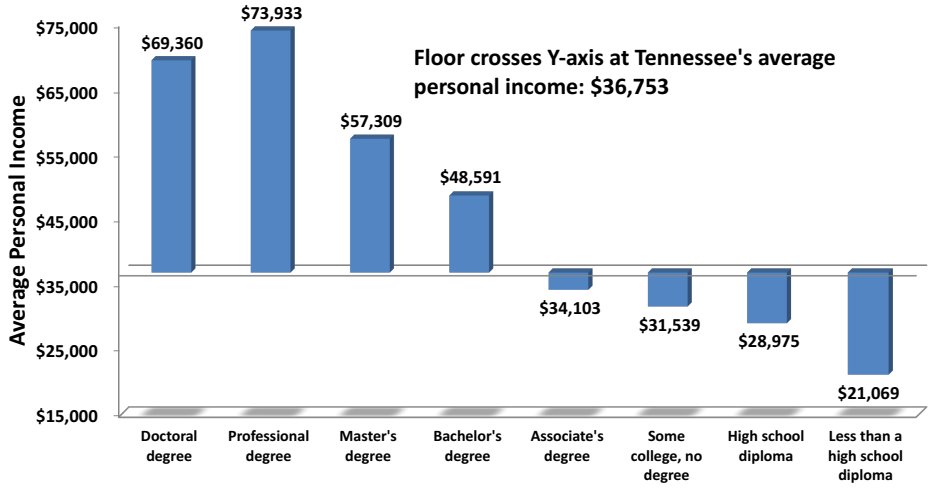
Average Personal Income by Educational Attainment in TN Ages 25 and Over, 2015



Source: US Bureau of Labor Statistics, Current Population Survey

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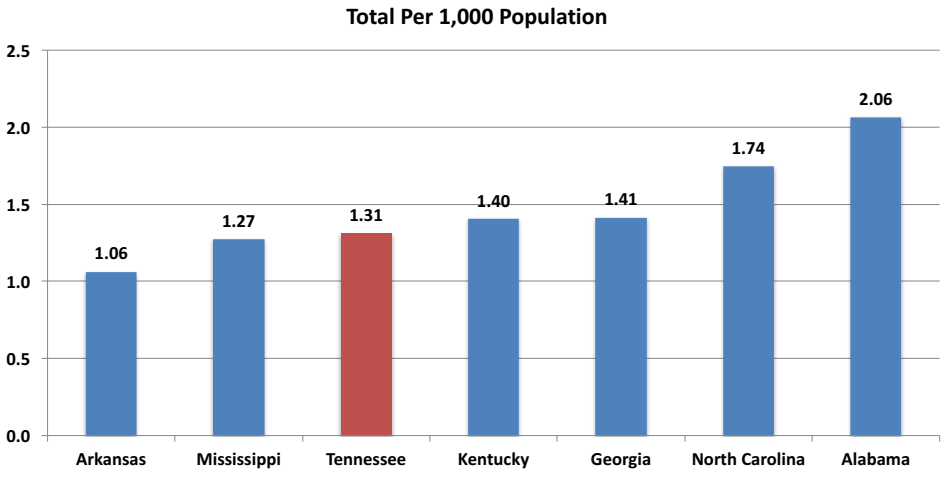
Graduate Degree Production by State, 2015



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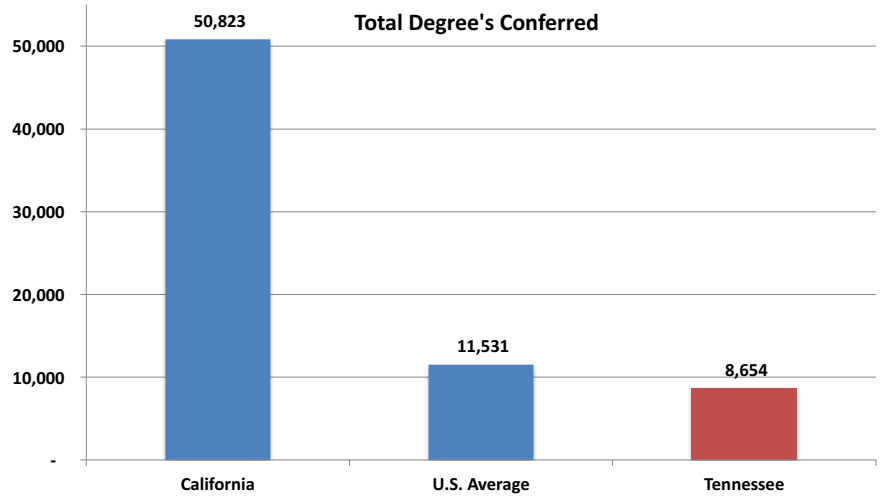
Sources Graduate Council State Snap Shots, 2016

Tennessee Graduate Degree Production Compared to California and US Average, 2016



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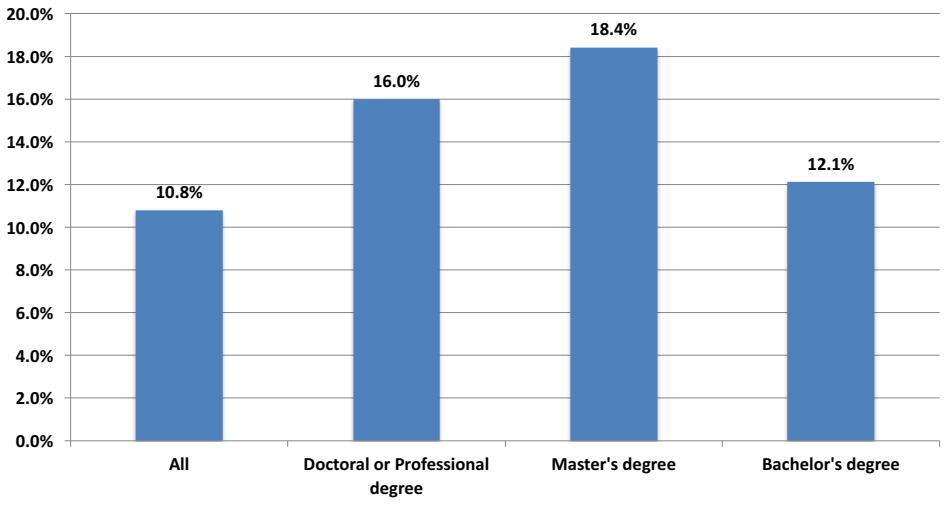
Sources Graduate Council State Snap Shots, 2016

Projected Job Growth between 2012 & 2022 by Typical Entry-level Education



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Source: Council of Graduate Schools, Master's degree requirements & the U.S. workforce, 2016

Projected Job Growth between 2012 & 2022 by Typical Entry-level Education

- Jobs that require a master's degree at entry-level are projected to be the fastest growing segment of the workforce between 2012 and 2022.
- Jobs that require a master's degree at entry-level, but do not require previous work experience are projected to grow even faster by 20.3%.
- These jobs include, but are not limited to: counselors, social workers, therapists, nurses, and social scientists, and represent an additional 369,400 jobs by 2022.

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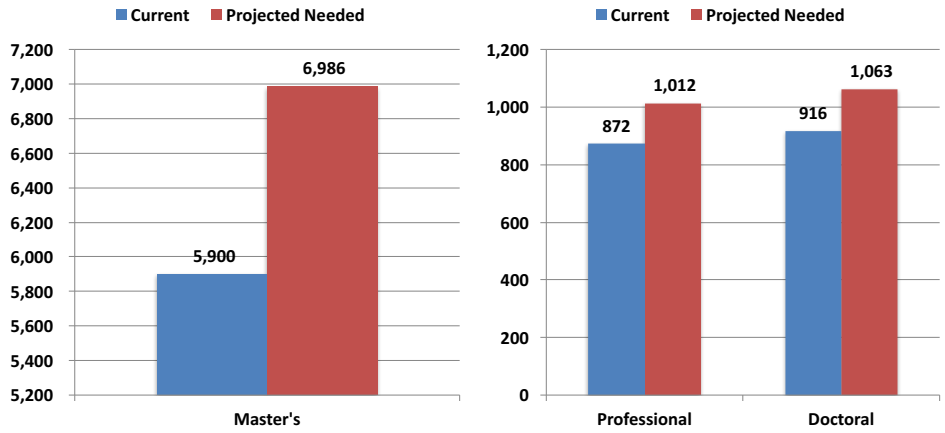
Source: Council of Graduate Schools, Master's degree requirements & the U.S. workforce, 2016

Current Number of Tennessee Graduate Degrees and the Number needed per year to meet Projected Demand by 2022



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Source: Council of Graduate Schools, Master's degree requirements & the U.S. workforce, 2016

Current Number of Tennessee Graduate Degrees and the Number needed to meet Projected Demand by 2022

- Tennessee needs to increase the number of Master's degrees by 1,086 per year.
- Tennessee needs to increase the number of Doctoral or Professional degrees by 147 per year.
- Tennessee's total demand is projected to increase by 18%.

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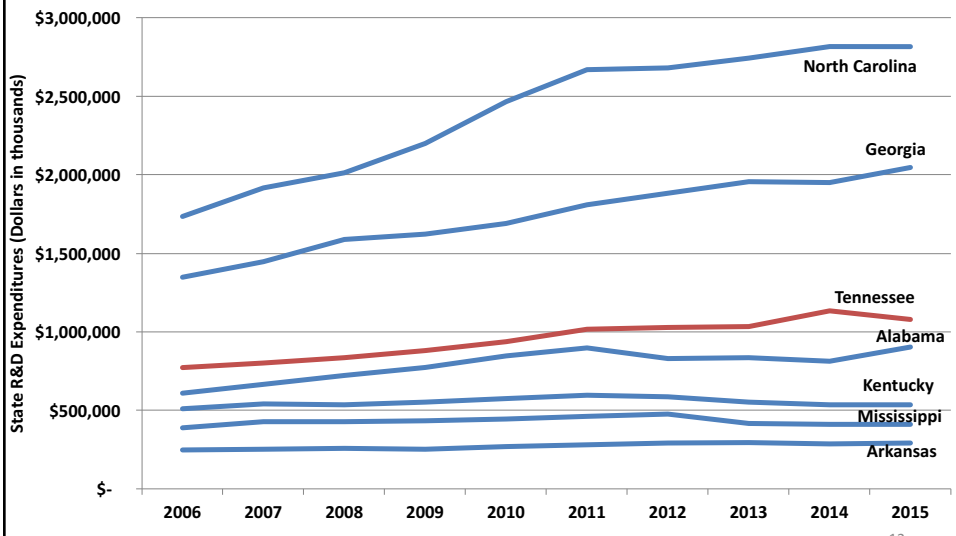
Source: Council of Graduate Schools, Master's degree requirements & the U.S. workforce, 2016

Higher Education R&D Expenditures, by State: FYs 2006 – 2015



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Source: Higher Education Research and Development Survey Fiscal Year 2015, NCES

Higher Education R&D Expenditures, by State and Source of Funds (in $1,000), FY 2015

State	All R&D expenditures	Source of funds					
		Federal government	State and local government	Institution funds	Business	Nonprofit organizations	All other sources
United States	68,667,801	37,876,879	3,812,408	16,711,730	4,000,614	4,236,993	2,029,177
Alabama	902,922	529,899	47,849	227,015	60,729	24,229	13,201
Arkansas	293,494	98,709	64,221	90,629	12,521	2,252	25,162
Georgia	2,046,068	1,210,757	53,130	570,182	107,007	81,742	23,250
Kentucky	532,991	227,125	58,830	177,031	16,054	22,964	30,987
Mississippi	408,232	194,209	92,269	90,166	22,370	7,682	1,536
North Carolina	2,815,343	1,600,445	147,577	540,057	337,324	152,002	37,938
Tennessee	1,075,972	626,143	31,129	315,223	52,200	38,807	12,470

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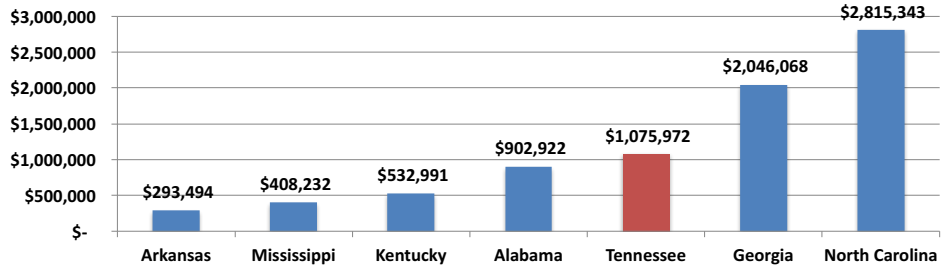
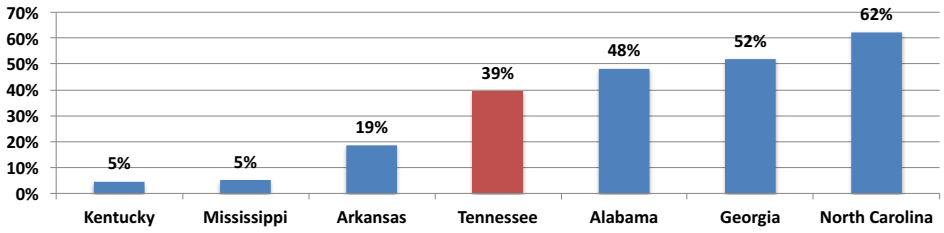
Source: Higher Education Research and Development Survey Fiscal Year 2015, NCES

Higher Education R&D Expenditures, by State FY 2015, 2006 – 2015



Percent Change



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Source: Higher Education Research and Development Survey Fiscal Year 2015, NCES

Higher Education R&D Expenditures, by State FY 2015, 2006 – 2015

- States like Arkansas and Alabama are rapidly increasing their expenditures on R&D.
- Tennessee needs to increase its expenditures on Higher Education R&D to remain competitive.
- Graduate students are the backbone of R&D projects in Tennessee Universities.

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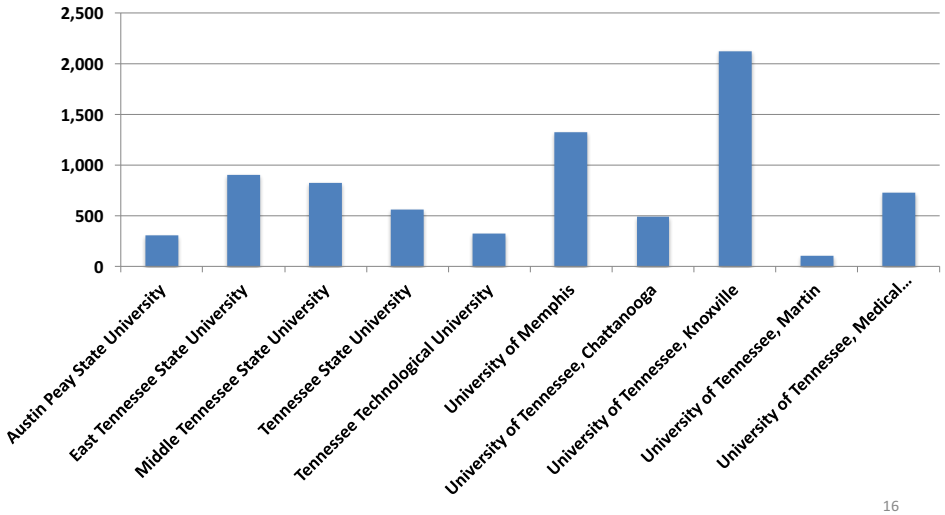
Total Graduate Degrees Awarded by Tennessee Public Universities



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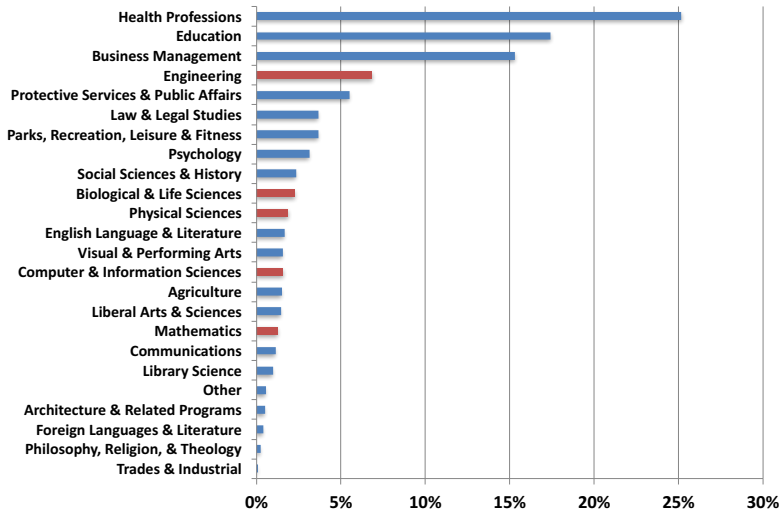
Source: Tennessee Department of Higher Education, 2014-2015 Tennessee Higher Education Fact Book, Table 2.4

Percent of Public Graduate Degree Awards by Discipline in Tennessee, 2014



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Source: Tennessee Department of Higher Education, 2014-2015 Tennessee Higher Education Fact Book, Table 2.5

Higher Education Research and Development

Higher Education
Research and Development

- **Why spend resources on Higher Education R&D?**
  - R&D expenditures provide an indication of the state's overall investment climate and capacity to create and disseminate knowledge.*

  -*Higher Ed. Institutions are critical in this role.*

  - **R&D expenditures support:**
    - Intellectual property development and licensing;
    - New technologies;
    - Formation of new businesses;
    - A higher standard of living in the long run.

*Center for Innovative Technology. See www.cit.org.

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The Economic Impact of Higher Education
R&D Expenditures in Tennessee, 2015

- **Total: $1.1 billion.**
- **Sources: Majority from Federal Funds (58.2%).**
- **Nearly 30.0% comes from the Institutions while the remainder comes from a variety of sources.**
- **State and Local Government funding accounts for just 2.9%.**

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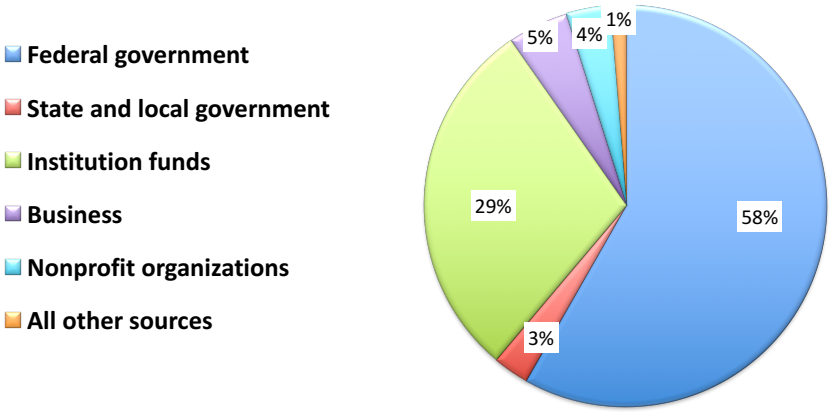
Source of Tennessee Higher Education R&D Expenditures in 2015



Source: Higher Education Research and Development Survey Fiscal Year 2015, NCES

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The Economic Impact of Higher Education R&D Expenditures in Tennessee, 2015

- **Higher Education R&D expenditures also provide a measurable economic impact in the *Short Run*.**
  - Effects estimated using the *IMPLAN©** economic impact methodology for Tennessee.
- **Economic Impact Basic Premise: One person's spending becomes another's income.**

*See www.implan.com for more information.

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The Economic Impact of Higher Education R&D Expenditures in Tennessee, 2015

- **In 2015, $1.1 billion in Higher Education R&D expenditures in Tennessee supported:**
  - **Nearly 13,000 jobs;**
  - **Labor Income of almost $900 million;**
  - **Tennessee produced Value Added of $1.2 billion;**
  - **Output (the total value of goods and services produced) of just over $2.2 billion.**
  - **Also helped generate an estimated $52.9 million in State and Local Tax revenues.**

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Top Ten Industries Benefited by Higher Education R&D Expenditures in Tennessee, 2015

Description	Employment
Scientific research and development services	5,591.5
Food services and drinking places	716.1
Employment services	567.9
Services to buildings and dwellings	515.6
Real estate establishments	338.1
Private hospitals	235.4
Offices of physicians, dentists, and other health practitioners	227.4
Management, scientific, and technical consulting services	196.7
Civic, social, professional, and similar organizations	180.3
Wholesale trade businesses	177.2

Source: SBBER estimate generated via the IMPLAN methodology.

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The Impact of Graduate Education on Lifetime Earnings

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Worklife Expectancy in Years by Educational Attainment at Age 25

Education Level	Men	Women	Average
High School	33.41	27.98	30.70
Some College	33.88	30.71	32.30
A.A. Degree	35.14	33.28	34.21
BA Degree	36.42	32.96	34.69
MA Degree	38.42	34.58	36.50
PROF/PHD Degree	40.09	37.12	38.61

Source: Gary R. Skoog, James E. Ciecka and Kurt V. Krueger, *The Markov Process Model of Labor Force Activity: Extended Tables of Central Tendency, Shape, Percentile Points, and Bootstrap Standard Errors, Journal of Forensic Economics 22(2), 2011, pp.165-229.*

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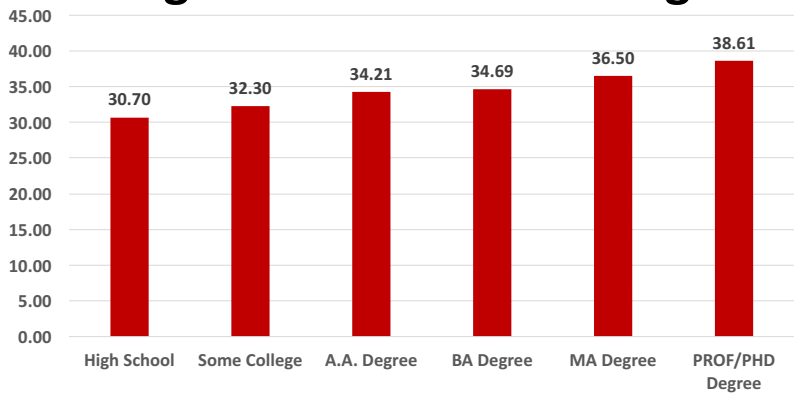
Worklife Expectancy in Years by Educational Attainment, Average of Both Genders at Age 25



Note: Values are the average of men and women combined. Original data is presented by gender.
Source: Gary R. Skoog, James E. Ciecka and Kurt V. Krueger, *The Markov Process Model of Labor Force Activity: Extended Tables of Central Tendency, Shape, Percentile Points, and Bootstrap Standard Errors, Journal of Forensic Economics 22(2), 2011, pp.165-229.*

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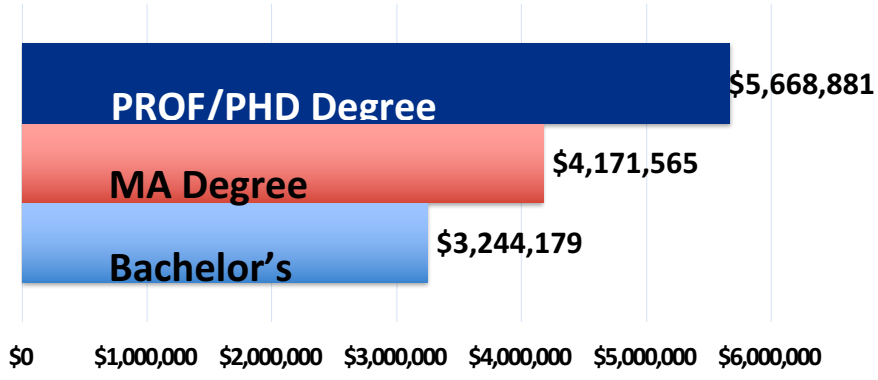
Lifetime Earnings by Educational Attainment



Sources: U.S. Bureau of Labor Statistics, Current Population Survey, and Gary R. Skoog, James E. Ciecka and Kurt V. Krueger, *The Markov Process Model of Labor Force Activity: Extended Tables of Central Tendency, Shape, Percentile Points, and Bootstrap Standard Errors, Journal of Forensic Economics 22(2), 2011, pp.165-229.*

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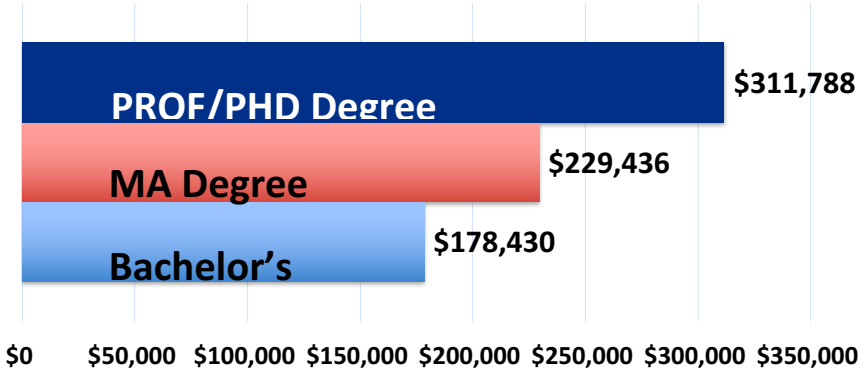
Lifetime State and Local Taxes by Educational Attainment



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Economic Impact of Adding 1,000 MAs and 1,000 PROF/PHDs on Tennessee Over a Work Life

	Employment	Labor Income	Value Added	Output
1,000 MAs	6,855.8	$327,144,749	$567,482,705	$921,655,283
1,000 PROF/PHDs	17,924.9	$855,337,890	$1,483,714,659	$2,409,718,291
Total	24,780.7	$1,182,482,639	$2,051,197,364	$3,331,373,574

Impacts are attributable to the difference in earnings between MA over Bachelor's and PROF/PHD over Bachelor's. Impacts were calculated using the IMPLAN methodology. Results are specific to Tennessee. For more information see implan.com.

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Benefits of More MAs, Professionals, and Ph.D.s

- **Increased Worklife**
  - MA degree results in nearly 2 years more over a Bachelor's.
  - PROF/PHD results in almost 4 years more than a Bachelor's.
- **Increased Earnings**
  - Over a worklife, an MA degree results in $927,386 more than a Bachelor's degree.
  - Similarly, a professional/Ph.D. degree results in $2.4 million more than a Bachelor's degree.
- **Increased Tax Payments to State and Local Governments**
  - Vs. a Bachelor's degree, 1,000 more MA graduates in TN would result in **$3.5 billion** more tax revenue to TN over their expected worklives, or a net present value of $1.6 billion.
  - Vs. a Bachelor's degree, 1,000 more PROF/PHD graduates would result in **$5.0 billion** more tax in tax revenue over their expected worklives, or a net present value of $2.7 billion.

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Why Support Graduate Education in Tennessee?

- More Graduate Education leads to:
  - Greater productivity;
  - Lower unemployment;
  - Higher incomes and a higher standard of living;
  - Additional tax revenue for Tennessee.
- A better workforce plus more R & D expenditures will result in more employers and increased opportunities for all Tennessee residents.

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