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Tennessee Public Postsecondary Graduates and the Labor Market:

Employment Prospects and Wage Trends

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Executive Summary

Tennessee has a reputation for being a leader in reform efforts to improve education at both the K–12 and postsecondary levels. Through the "Drive to 55" education initiative, Governor Bill Haslam has put the improvement of Tennessee's higher education at the center of his tenure. The initiative challenges the state to increase the percentage of adults with postsecondary credentials from 36% to 55% by 2025. In pursuit of this effort, Tennessee has introduced several college-going and postsecondary completion initiatives, including changing the delivery of developmental coursework, offering free community college tuition for recent high school graduates, recruiting adults without degrees to reenter institutions of higher education, and better aligning postsecondary offerings with workforce opportunities across the state.

College Measures' new EduTrendsTN website (http://www.edutrendstn.com), developed in partnership with the State of Tennessee, supports these initiatives by providing prospective students and their families with information about higher education costs, benefits, and affordability and delivering insights into employment demand and wage potential across many fields. This website delivers important information to Tennesseans so they can make better informed decisions about their choices of colleges, credentials, and fields of study. The EduTrendsTN project should also increase consumers' awareness of careers in high demand and where students who complete various kinds of postsecondary credentials will be more likely to find jobs.

This report highlights just some of the information that can be found on the EduTrendsTN website (http://www.edutrendstn.com). The following are some of the noteworthy findings from our study on the labor market success of postsecondary education completers.[1]

Subbaccalaureate Credentials

- Nearly 90,000 bachelor's degrees were granted during the five academic years (from Academic Year 2006–07 to Academic Year 2010–11) covered for this report. While bachelor's degrees are the most commonly awarded postsecondary credentials in the state's public system of higher education, more than 84,000 subbaccalaureate credentials—including associate's degrees, diplomas, and certificates—were awarded from 2006–07 to 2010–11. Subbaccalaureate credentials are often designed to prepare students for careers in a specific field related to postsecondary training that students received.

1 In this report, "completers" is a general term used to identify any person who has completed any level of postsecondary education (e.g., certificates, diplomas, bachelor's degrees, etc.). "Graduates" is a more specific term used to identify any person who has earned a degree (e.g., associate's, bachelor's, or master's.).

- On average, the market value for associate's degrees and certificates that require 1–2 years of training is higher than that for shorter term certificates. Additionally, the median wages of students with longer term certificates and associate's degrees often exceed those of graduates with bachelor's degrees. This is particularly true in the years immediately after graduation. This gap typically closes after 5 years, as graduates with bachelor's degrees often experience greater increases in wages than completers with subbaccalaureate credentials.

- Diplomas granted by Tennessee's Colleges of Applied Technology (TCATs) emphasize practical workforce training, usually in their local labor markets. Many students who earn these diplomas are first-generation college students, which is a key demographic group needed to achieve the Drive to 55.

    - During the first 5 years after earning diplomas from TCAT-Covington, TCAT-Memphis, TCAT-Nashville, and TCAT-Whiteville, completers found jobs with starting salaries above the state median for diploma completers. On average, students from these four colleges earned more than $40,000 per year 5 years after graduating.

    - Among diploma programs with the largest number of completers, those with diplomas in Ground Transportation and Heavy/Industrial Equipment Maintenance Technologies earned the highest median wages 1 year of graduation. Five years after graduation, these completers earned wages 20% higher than their counterparts with diplomas in other fields. For example, completers of four programs—Allied Health and Assisting Services, Allied Health Diagnosis, Business Operations Support and Assistant Services, and Health and Medical Administrative Services—earned wages below the state median 1 and 5 years after graduation. Completers in these fields also experienced wage growth below the state median for completers with diplomas.

Associate's Degrees

- Among the 10 associate's degree programs with the highest number of completers statewide, those in four of the programs earned wages that were below the state median for all associate's degrees 1 and 5 years after graduation. The four programs were Business Administration, Business Operations, Liberal Arts, and Management Information Services. Of these, graduates with degrees in Management Information Services also experienced the lowest rate of wage growth among the 10 largest programs.

- The instructional program with the highest median wage (more than $61,000) 5 years after graduation was Electrical Engineering Technologies/Technicians. Graduates in this field also experienced the most rapid increase in wage growth from their first to fifth year after graduating. One year after graduating, graduates in this field earned about $5,000 more than the median wage for all associate's graduates and $7,000 more than the median wage of bachelor's graduates. Five years after graduating, thanks to a 46% increase in wages, associate's graduates in Electrical Engineering Technologies/Technicians earned almost $20,000 more than the state median for all associate's *and* all bachelor's graduates statewide—about $12,000 ahead of Allied Health and Medical Assisting Services graduates and $7,000 ahead of Nursing graduates (two of the highest paying fields in the state).

- Associate degree programs in Liberal Arts and Nursing are very popular postsecondary options in Tennessee. Graduates with associate's degrees in Nursing from every community college in the state earned more, often far more, than graduates with associate's degrees in Liberal Arts. One year after graduation, the differences were approximately $25,000 one year after graduation (e.g., for Dyersburg State, Jackson State, and Southwest Tennessee Community Colleges). After 5 years, the differences were more than $20,000 (e.g., for community colleges at Chattanooga, Columbia, and Southwest Tennessee).

- Wages earned by graduates varied across community colleges, likely because of the local job market's demand for graduates and prevailing wages. The median wages of graduates with associate's degrees in Liberal Arts ranged from $25,000 (Jackson State Community College) to $30,000 (Motlow State) 1 year after graduating and from $31,000 (Chattanooga State) to $39,000 (Motlow State) after 5 years. The differences were even larger for graduates with associate's degrees in Nursing, ranging from around $44,000 (Chattanooga State) to $55,000 (Southwest Tennessee) 1 year after graduating and from $49,000 (Cleveland State) to $58,000 (Southwest Tennessee) after 5 years.

Bachelor's Degrees

- Among bachelor's graduates, there is wide variation in the earnings associated with different instructional programs. In contrast, there is less variation across the earnings of graduates from different universities across the state. This may reflect the facts that graduates from universities tend to be less tied to the local labor market and many graduates from institutions in smaller markets may migrate to larger ones. But the fact remains that if students don't get into the University of Tennessee, Knoxville—the state's flagship university—they can graduate from many other universities across the state and do as well in the labor market.

- Among the nine universities in the state, the median wages of graduates from three of them are within $500 of the state median for graduates with bachelor's degrees in all fields. In another three, the difference from the state median is between $500 and $1,000. The largest difference was observed among graduates from the University of Memphis, where the median wage of its graduates 1 year after graduating is $1,700 above the wages of all bachelor's graduates in the state. This likely reflects the fact that Memphis is the highest priced labor market in the state.

- Across Tennessee's universities, there are substantial differences in the rate at which the wages of bachelor's graduates grow 1–5 years after graduating in two large disciplines examined in depth in this report. Four-year cumulative growth rates for business graduates from every university were higher than that of graduates with multi- or interdisciplinary degrees. But wage growth also varies across programs at different universities. The growth rate experienced by business graduates ranged from 18% (Austin Peay) to 45% (University of Tennessee, Martin). Similarly, among inter- or multidisciplinary graduates, the growth rate ranged from about 12% (Austin Peay and Middle Tennessee State) to 27% (University of Memphis).

Labor Market Demand for Postsecondary Completers

- In some fields, many more people are completing training than will likely find employment in that field. In other fields, the state projects many more openings relative to the number of people with the training to fill those openings. The fields of Cosmetology and Journalism are projected to have large numbers of students completing education or training relative to the number of job openings projected to exist. These are relatively low paying fields, but some fields with large numbers of completers relative to openings are high paying—for example, Aviation Maintenance, Mechanical Engineering, Electrical/Computer Engineering, and Business Management.

Introduction

Postsecondary education is high on the policy agendas of most states and the nation. In the State of Tennessee, Governor Bill Haslam has put postsecondary education at the center of his tenure. In his Drive to 55 education initiative, the governor is challenging the state to increase the percentage of adults with a postsecondary credential from 36% to 55% by 2025. According to the governor, reaching this goal will involve increasing the number of 2- and 4-year degrees, as well as certifications in such fields as welding and mechatronics.[2] In pursuit of this effort, Tennessee has introduced several college-going and postsecondary completion initiatives, including changing the delivery of developmental coursework, offering free community college tuition for recent high school graduates, recruiting adults without degrees to reenter institutions of higher education, and better aligning postsecondary offerings with workforce opportunities across the state.

College Measures' new EduTrendsTN website (http://www.edutrendstn.com), developed in partnership with the State of Tennessee, supports these initiatives by providing prospective students and their families with information about higher education costs, benefits, and affordability and delivering insights into employment demand and wage potential across many fields. This website offers important information to Tennesseans so they can make better informed decisions about their choices of colleges, credentials, and fields of study. The EduTrendsTN project should also increase consumers' awareness of careers in high demand and where students who complete various kinds of postsecondary credentials will be more likely to find jobs.

The cost of college has increased dramatically nationwide, and student debt is now a frontline issue facing students, families, and policymakers. As students make better informed decisions, they may be more likely to complete their studies without accumulating excessive debt, and after completing their studies, they may become more productive members of the economy—contributing to the future growth of the State of Tennessee and the nation.

Exploring the Data and Their Limitations

This section describes some limitations of the data that the reader should keep in mind when reading this report or accessing the more detailed data available on the EduTrendsTN website (http://www.edutrendstn.com).

2 For more information, visit the Drive to 55 website (http://www.driveto55.org/).

With the support of Lumina Foundation, College Measures[3] is assisting in the efforts of state agencies, such as the Tennessee Higher Education Commission, to make publicly available information about the wages of completers from programs of postsecondary education.[4]

Together, College Measures, the State of Tennessee, and other partner states are making it possible to compare the wages of completers at the state, institution, and program levels. In an earlier round of research, the Tennessee Higher Education Commission partnered with College Measures to report the wages of completers 18 months after program completion.[5] Many critics thought that the 18-month timeframe was too short to report on something as consequential as the labor market success of postsecondary education completers.

This current work updates information on wages at 18 months ("first year") and now includes wage data from students who graduated 3 and 5 years earlier. This information is critical to tracking more carefully the economic payoff of different programs of study and allows a more thorough look into how the trajectory of wage growth differs across institutions, instructional programs, and types of postsecondary credentials.

The data in this report show that wages and wage growth vary across programs of study and institutions in the state.[6] Because students study a specific subject in a specific college, this detailed information matters. For example, graduates with degrees in Business or Psychology from one institution may earn substantially more than graduates with the same degrees from other institutions—and the differences between graduates with different degrees may be even bigger. The information in this report offers data that prospective students can use to select an institution and instructional program, estimate the potential wages that they may achieve, and think more carefully about the debt they may incur while financing their postsecondary education.

3 For more information about College Measures, go to http://www.collegemeasures.org. For more information about College Measures' role in reporting on the success of postsecondary completers in the labor market, visit http://www.collegemeasures.org/esm.

4 The Technical Appendix describes how wages and other measures were computed in this report.

5 See *The Earning Power of Graduates From Tennessee's Colleges and Universities: How Are Graduates From Different Degree Programs Doing in the Labor Market?* (http://www.air.org/sites/default/files/downloads/report/Earning_Power_TN_Graduates_Sept12_0.pdf)

6 Note that only data from public institutions are discussed in this report. Across the nation, very few states have collected data from private institutions (either not-for-profit or for-profit), but most students attend public institutions. In Tennessee, public institutions enroll about 80% of all full-time equivalent students in 4-year and above institutions of higher education—about the same percentage of full-time equivalent students enrolled in 2-year institutions.

This report also provides more data about the growth in wages during the first 5 years of employment after completing postsecondary studies. Completers in some fields may start off with relatively low wages but may experience more rapid increases in wages than completers from other fields. Completers with certain credentials may start off quite high but experience low rates of wage growth compared with others. This report highlights some of these different rates of growth, but the website (http://www.edutrendstn.com) has more detailed information for far more instructional programs and credentials than reported here.

This report also delivers estimates of the demand for different types of jobs and careers. The number of jobs in some fields is projected to increase sharply over the next few years, but the demand for others may be low. While it is important to know what wages are associated with different fields of study and different postsecondary credentials, knowing the likelihood of finding a job is just as important. Because completers of postsecondary studies are often mobile, the EduTrendsTN website reports job demand for each of Tennessee's 13 Local Workforce Investment Areas.[7] For completers who are less mobile, knowing which jobs are likely to be available in their *local* labor market is important.

Wages of completers are not the only measure of how a program or institution benefits its students. Postsecondary education is associated with many valuable outcomes—better health, longevity, high levels of civic participation (e.g., voting and volunteering), and so on. Additionally, the labor market success of each completer reflects a variety of factors independent of his or her educational experience, such as personal background and the extent and characteristics of opportunities available in the local job market. Completers take many different paths after graduation. For students in some institutions and at certain degree levels (e.g., transfer-oriented academic associate's degrees or bachelor's degree programs focused on preparation for graduate study), wage outcomes soon after graduation may be less important than for other students who are completing their formal postsecondary education.

As a final cautionary note, the wage data used in this project come from the state's unemployment insurance system. Because this type of data is limited to workers in the state, the dataset does not include the wages of completers who work outside Tennessee.[8] In turn, the percentage of completers covered by the wage data reported here varies across programs and institutions.

In short, the data used in this report present a somewhat limited picture of the total contribution that programs and institutions make to the success of their completers. However, from the perspective of the State of Tennessee, this limitation is less severe than it may seem at first glance.

7 For more information about the Local Workforce Investment Areas, visit http://www.tn.gov/labor-wfd/cc/ccareas.htm.

8 For more information about Tennessee's unemployment insurance system, visit http://www.tn.gov/labor-wfd/esdiv.shtml#.

For example, by measuring the percentage of graduates who remain in the state to work after graduation, a state can see which institutions and programs are contributing the most toward improving the economic prospects and quality of life of residents in the state. And, despite data limitations, the wages that completers achieve in the labor market represent valuable information, especially for prospective students and their families as they consider plans for higher education and how to finance that education.

This report presents just some of the highlights from the data. For a far deeper look into the data and the patterns of wages and labor demand across Tennessee, go to http://www.edutrendstn.com.

Postsecondary Credentials in Tennessee: An Overview

Tennessee's institutions of higher education offer a wide range of postsecondary credentials. During the five academic years covered by this report and the website (Academic Year 2006–07 to Academic Year 2010–11),[9] the bachelor's degree was by far the most commonly awarded credential in the state (Figure 1). At nearly 90,000, the number of bachelor's degrees awarded far outpaced the number of associate's degrees, which was the second most common postsecondary credential granted during the time period.

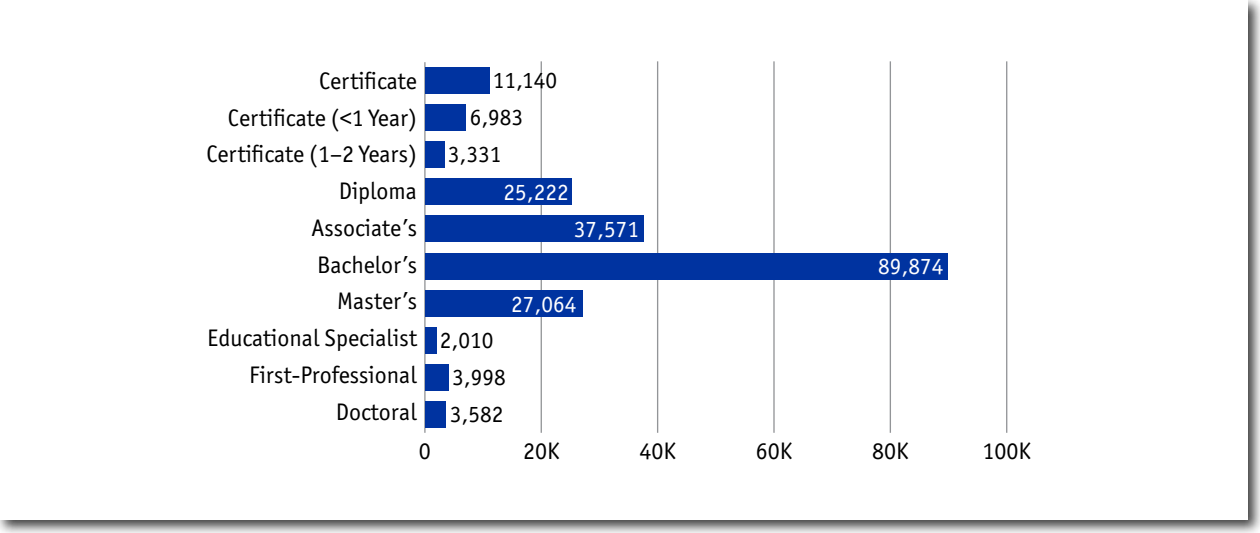
However, students in Tennessee earned other subbaccalaureate credentials in addition to associate's degrees. More than 25,000 diplomas and more than 20,000 certificates were awarded during the five academic years.[10] Together, more than 84,000 subbaccalaureate credentials were awarded, making the gap between the bachelor's degree and subbaccalaureate credentials smaller than it appears at first glance.

9 The five academic years begin in the summer of 2006 and end in the Spring of 2011.

10 Diplomas are awarded to students who have demonstrated the competencies required for a program and have been awarded the appropriate diploma upon completion, usually in programs of at least 900 hours. Certificates are awarded to students who have demonstrated the competencies required for a program and have been awarded the appropriate certificate upon completion, usually in programs of fewer than 900 hours. "Certificates" shown in Figure 1 are awarded only by TCATs. Other institutions award other certificates of less than 1 year or 1–2 years. See the Technical Appendix for more details.

According to Figure 1, Tennessee's postsecondary institutions also granted a fairly large number of master's degrees, but the number of advanced degrees granted after the master's level is far lower than most other credentials.

Figure 1: Number of Completers of Postsecondary Education for Academic Years 2006–11, by Credential

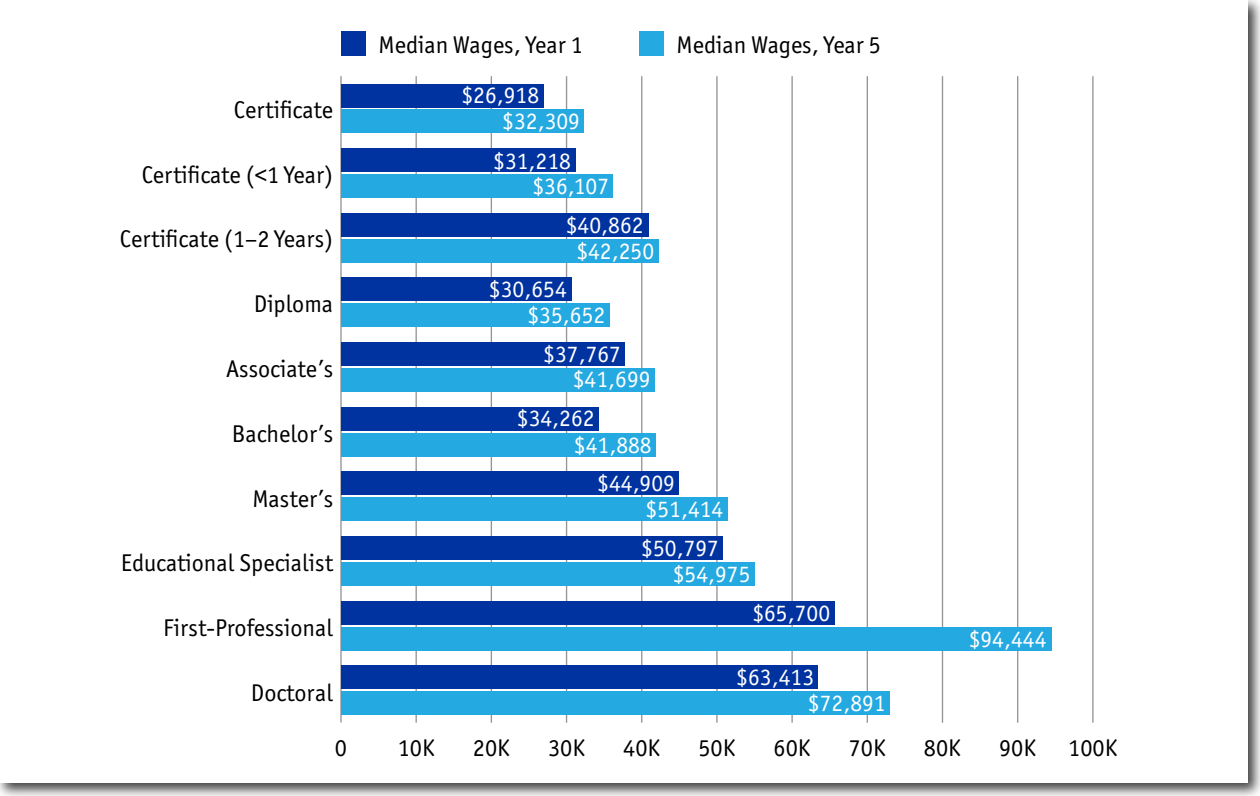


The Overall Relationship Between Postsecondary Credentials and Wages

Figure 2 shows the median wages of completers with different credentials after 1 and 5 years of receiving a postsecondary credential. Figure 3 reports the growth in wages over the first 5 years after having completed postsecondary education. Several patterns can be found in these two charts.

As evident in Figure 2, many subbaccalaureate credentials have economic value, particularly certificates that require 1–2 years of training and associate's degrees. At the end Year 1, completers with both types of credentials earned several thousand dollars *more* than the average bachelor's degree holder (more than $37,000 for associate's graduates and over $40,000 for holders of long-term certificates versus approximately $34,000 for bachelor's graduates).

Figure 2: Median Earnings 1 and 5 Years After Completing Postsecondary Education, by Credential



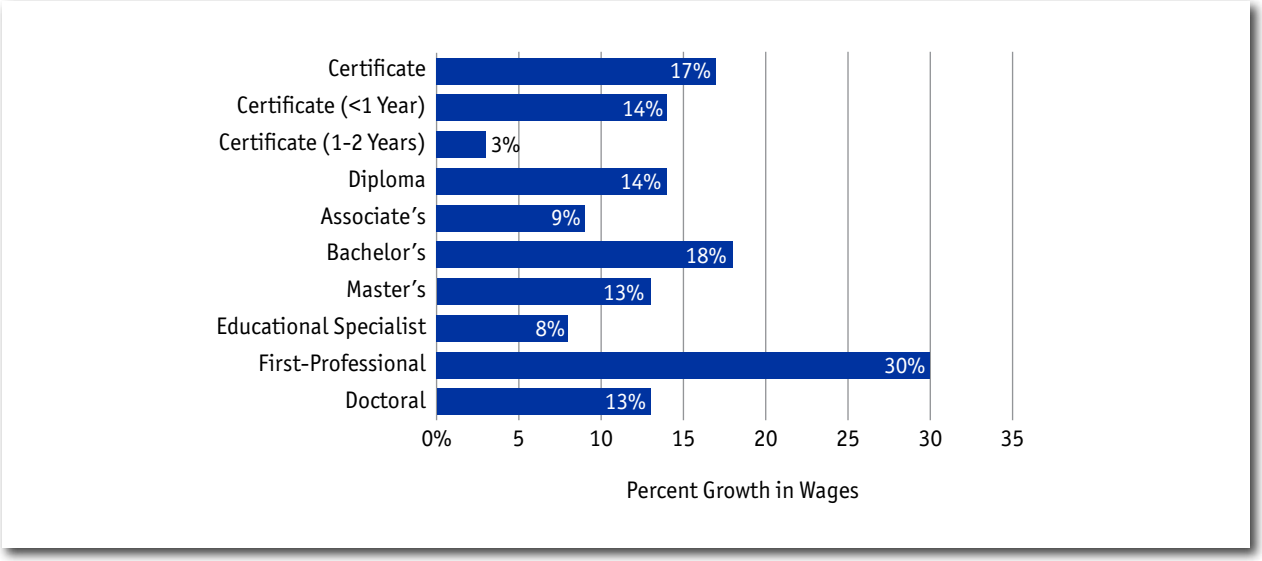
Over time, bachelor's degree holders on average experienced higher rates of wage growth than did subbaccalaureate completers. Thus, after 5 years, bachelor's graduates had median wages a few hundred dollars *above* those with associate's graduates but still about $500 *lower* than holders of 1–2 year certificates. Census data for the nation suggest that bachelor's graduates historically experience higher wage growth over their work life than associate's graduates. In turn, over a lifetime, a bachelor's graduate will, on average, earn more than someone with a subbaccalaureate credential.

However, the Census data are based on the *average* experience of all bachelor's and associate's graduates. The data in Tennessee suggest a wide variation in wages among associate's degree holders and substantial wage benefits with many subbaccalaureate programs. For example, technical associate's degrees can have high market value, and many bachelor's degrees are awarded in fields with low wage premiums.[11] Hence, the gap in favor of bachelor's graduates may be getting smaller than it has been in the past and is affected strongly by the field of study.

11 As noted previously, wages are only one of the many rewards of postsecondary education. Many of the programs with the lowest wage premiums are core to a liberal arts education.

Master's degrees tend to lead to a high return on a student's investment of time and money. The wage premium associated with a master's degree is about $10,000 per year compared with the median wages of graduates with bachelor's degrees. Annual wages are by far the highest for students who earn first-professional degrees (e.g., Law, Dentistry, Medicine, Pharmacy, and Veterinary Medicine). The large increase in the wages of first-professional graduates is largely driven by the much higher wages that medical graduates experience later in their careers, as these graduates work mainly in low paying positions during only the first few years after medical school while completing their training.[12]

Figure 3: Percent Growth in Wages From Year 1 to Year 5 After Completing Postsecondary Education, by Credential



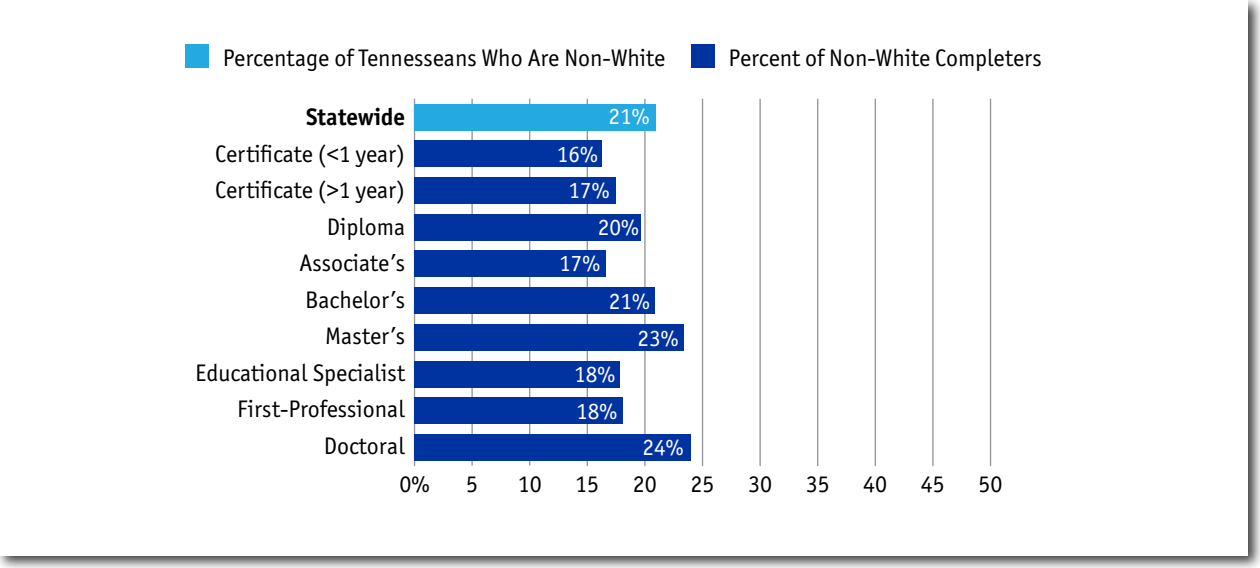
Demographics of Completers

Like most states, Tennessee is committed to broadening the access of different types of students to postsecondary education. Given the changing demographics of the state and the nation, the Drive to 55 initiative can succeed only if the number of "non-traditional" students (i.e., those from a wider range of race, ethnicity, and social status than have typically completed postsecondary education) enroll and succeed in Tennessee's institutions of higher education. Figures 4 and 5 show some of the demographic characteristics of completers of postsecondary credentials.

12 Data available on the website show that graduates from medical programs typically earn less than $50,000 in their first year after graduation, but that value jumps to more than $140,000 by Year 5.

To give a baseline for comparison purposes, Figure 4 shows the statewide percentage of Tennesseans that is non-White, according to the U.S. Bureau of the Census.

Figure 4: Percent of Non-White Completers of Postsecondary Education, by Highest Credential, Academic Years 2006–11



The percentage of completers that were non-White is tightly clustered around the statewide average for non-Whites (21%). The percentage of non-White completers at the bachelor's, master's, and doctoral levels is either at or slightly above the statewide average for non-Whites. In contrast, the percentage of non-Whites who completed certificates and associate's degrees is about 3–4% below the statewide average for non-Whites. The percentage of non-Whites who earned diplomas is slightly below the statewide average for non-Whites.

To achieve the goals of Tennessee's Drive to 55 initiative, the pool of students must be expanded to include many more first-generation college goers. Figure 5 shows the distribution of recent first-generation adults (over 25 years of age) in Tennessee to complete postsecondary education by the highest credential attained.[13] Although these statewide figures are not exactly comparable to the enrollment numbers from the Tennessee Higher Education Commission, they do serve as a rough benchmark.

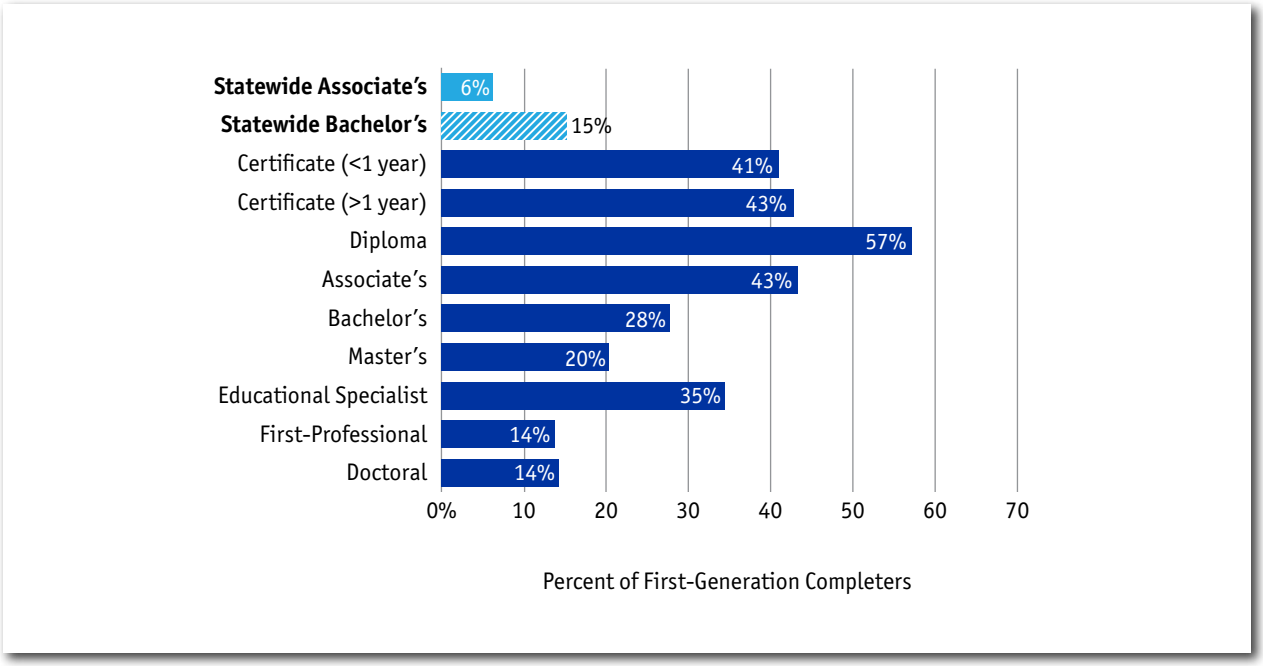
13 American Community Survey (http://quickfacts.census.gov/qfd/states/47000.html).

Clearly, subbaccalaureate programs are an important option for first-generation postsecondary students. More than 40% of completers in each of the subbaccalaureate credentialing programs were first-generation college goers. To the extent that these subbaccalaureate credentials are associated with good wages, they can be important stepping stones into the middle class for a new generation of Tennesseans.

As was shown in Figure 1, the bachelor's degree is the most frequently awarded postsecondary credential in Tennessee. Nearly 28% of bachelor's graduates during the five academic years studied were first-generation college-goers, almost double the percentage of the current adult population in Tennessee that has a bachelor's degree. About 8% of adults in Tennessee have more than a bachelor's degree (not shown in the chart), and a far higher percentage are first-generation college goers who are pursuing more advanced degrees.

Tennessee is expanding the educational opportunities being made available to first-generation college students and the large percentage of first-generation students enrolling in subbaccalaureate pathways is critical to the success of Drive to 55.

Figure 5: Percent of Recent First-Generation Completers of Postsecondary Education, by Highest Credential



Note: The solid light blue bar represents the percent of the adult population (>25 years of age) in Tennessee with an associate's degree as its highest level of educational attainment. The hatched light blue bar represents the percent of the adult population in Tennessee whose highest level of education is a bachelor's degree.

Source: American Community Survey

Subbaccalaureate Credentials

Diplomas

Table 1 shows the wages of diploma holders from TCAT campuses. These institutions emphasize practical workforce training, usually focused on the local labor market. As noted previously, first-generation postsecondary students are well represented in diploma programs. Moreover, the percentage of non-White students who had successfully earned a diploma is higher than the percentage of non-White students who had earned other subbaccalaureate credentials.

The rows with bolded text in Table 1 show the statewide median wages at Years 1 and 5 and the percent change in wages over time for completers of associate's degrees, long-term certificates (1–2 years), and diplomas. One and 5 years after course completion, completers with diplomas earned less than completers of long-term certificates and associate's degrees. However, wages grew more quickly for completers with diplomas than wages for completers with other subbaccalaureate credentials. Despite such rapid growth, completers with diplomas still lagged behind those with the other two subbaccalaureate credentials by $6,000–$8,000.

Table 1 also reports wage data for diploma completers at 26 TCAT campuses across the state. Red text highlights wages and rates of wage growth that fall below the state median (16.3%). Thus, completers from any TCAT campus can fall below the state benchmark on up to three measures: wages at Year 1, wages at Year 5, and growth rate from Year 1 to Year 5.

Completers with diplomas from six TCAT locations fell below the state median on all three indicators: TCATs at Knoxville, Paris, Hohenwald, Crossville, Elizabethton, and Dickson.

In contrast, wages for completers at five TCATs (Covington, Memphis, Morristown, Nashville, and Whiteville) were higher than median wages at Years 1 and 5 and the median growth rate. Among completers at four TCATs (Covington, Memphis, Nashville, and Whiteville), cumulative wage growth rates were above 20% and starting salaries began above the state median. The TCAT at Covington is particularly notable, since its diploma completers 5 years after completion had higher median wages than the average graduate with a bachelor's or associate's degree.

Table 1: Median Wages and Percent Change 1 and 5 Years After Completing Diplomas From the Tennessee Colleges of Applied Technology

TCAT Campus	Median Wages, Year 1	Median Wages, Year 5	% Change From Year 1 to Year 5
Crump	$28,701	$34,506	20.2%
Livingston	$28,772	$34,695	20.6%
Knoxville	$28,846	$31,254	8.3%
McMinnville	$29,142	$34,048	16.8%
Hohenwald	$29,192	$31,981	9.6%
Ripley	$29,344	$35,934	22.5%
McKenzie	$29,538	$35,908	21.6%
Paris	$29,759	$31,792	6.8%
Elizabethton	$29,902	$33,393	11.7%
Oneida	$29,992	$36,740	22.5%
Crossville	$30,287	$33,256	9.8%
Murfreesboro	$30,340	$37,514	23.6%
Harriman	$30,381	$35,655	17.4%
Athens	$30,399	$36,423	19.8%
Dickson	$30,579	$34,931	14.2%
Statewide Median Diplomas	**$30,654**	**$35,652**	**16.3%**
Jackson	$30,731	$35,112	14.3%
Jacksboro	$30,755	$33,877	10.1%
Morristown	$30,986	$36,555	18.0%
Hartsville	$30,991	$34,287	10.6%
Pulaski	$31,640	$35,417	11.9%
Newbern	$31,764	$32,522	2.4%
Shelbyville	$31,840	$36,151	13.5%
Memphis	$33,484	$41,058	22.6%
Nashville	$33,494	$40,412	20.7%
Whiteville	$33,631	$40,900	21.6%
Covington	$37,118	$47,008	26.6%
Statewide Median Associate's Degree	**$37,767**	**$41,699**	**10.4%**
Statewide Median Long-Term Certificate (1–2 Years)	**$40,862**	**$43,072**	**5.4%**

Note: Entries in red highlight data that fall below the respective state median for diplomas. An additional TCAT, at Chattanooga, operates as a division of Chattanooga State Community College.

Diploma Completers: Wages for Popular Programs

Table 2 presents the wages and wage growth of completers of diplomas at Years 1 and 5 for the 15 TCAT programs of study with the largest numbers of completers.[14] The programs with the highest number of completers were Nursing (more than 7,000) and Business Operations Support and Assistant Services (more than 4,000). Three programs had fewer than 500 completers: Dental Support Services and Allied Professions, Drafting/Design Engineering Technologies/Technicians, and Health and Medical Administrative Services. As in Table 1, the row with bolded text identifies the state median for the three measures, and red text highlights data that fall below the respective state median for diplomas.

All three measures fell below the state median for completers in four programs: Allied Health and Assisting Services, Allied Health Diagnosis, Business Operations Support and Assistant Services, and Health and Medical Administrative Services. At four other programs—Cosmetology, Dental Support Services, Drafting/Design Engineering Technologies, and Vehicle Maintenance and Repair Technologies—completers fell below the state medians at both points in time but experienced growth rates that were higher than the state median.

Note, that in general, fields with low pay after 1 year of employment are also low 5 years later. Over time, only one program—Electrical/Electronics Maintenance and Repair—moved from below the state median to above the state median for diplomas. For no program did completers fall from above the state median to below it. This stability in the relative pay of completers over time is not unique to diplomas.

Looking at median wages of completers across programs, with a few exceptions, the general rule of thumb is "start low, end low."

14 A program of study is a group of academic programs (defined by the 2010 Classification of Instructional Programs, or CIP codes) and associated occupations (defined by the 2010 Standard Occupational Classification, or SOC codes) in which students train. Tennessee maintains 207 programs of study that are based on the 16 educational clusters developed by national career and technical educators and the programs of study within those clusters in use by the Tennessee Department of Education, Career and Technical Education Division. The Tennessee Department of Labor subdivided some of the programs of study to more closely align with educational programs and usual occupational outcomes.

Table 2: Median Wages and Percent Change 1 and 5 Years After Completing Diplomas, by the 15 Programs at TCAT With the Largest Numbers of Completers

Program	Median Wages, Year 1	Median Wages, Year 5	% Change From Year 1 to Year 5
Cosmetology and Related Personal Grooming Services	$21,379	$25,185	17.8%
Business Operations Support and Assistant Services	$22,634	$26,008	14.9%
Health and Medical Administrative Services	$22,742	$26,202	15.2%
Allied Health and Medical Assisting Services	$23,165	$26,656	15.1%
Dental Support Services and Allied Professions	$24,768	$30,136	21.7%
Vehicle Maintenance and Repair Technologies	$26,638	$34,298	28.8%
Drafting/Design Engineering Technologies/Technicians	$28,777	$35,230	22.4%
Allied Health Diagnostic, Intervention, and Treatment Professions	$29,626	$33,987	14.7%
Electrical/Electronics Maintenance and Repair Technology	$30,411	$37,622	23.7%
Statewide Median Diplomas	**$30,654**	**$35,652**	**16.3%**
Heating, Air Conditioning, Ventilation, and Refrigeration Maintenance Technology/Technician (HAC, HACR, HVAC, HVACR)	$30,654	$35,996	17.4%
Nursing	$32,755	$36,898	12.6%
Precision Metal Working	$33,132	$41,893	26.4%
Electrical and Power Transmission Installers	$33,135	$36,149	9.1%
Ground Transportation	$33,332	$42,198	26.6%
Heavy/Industrial Equipment Maintenance Technologies	$34,848	$42,606	22.3%

Note: Entries in red highlight data that fall below the respective state median for diplomas

Differences in Wages at Year 1 Among Diploma Completers

Students earn their diplomas in different programs from different TCAT campuses. Wages vary among completers by campus and, even more so, by field of study.

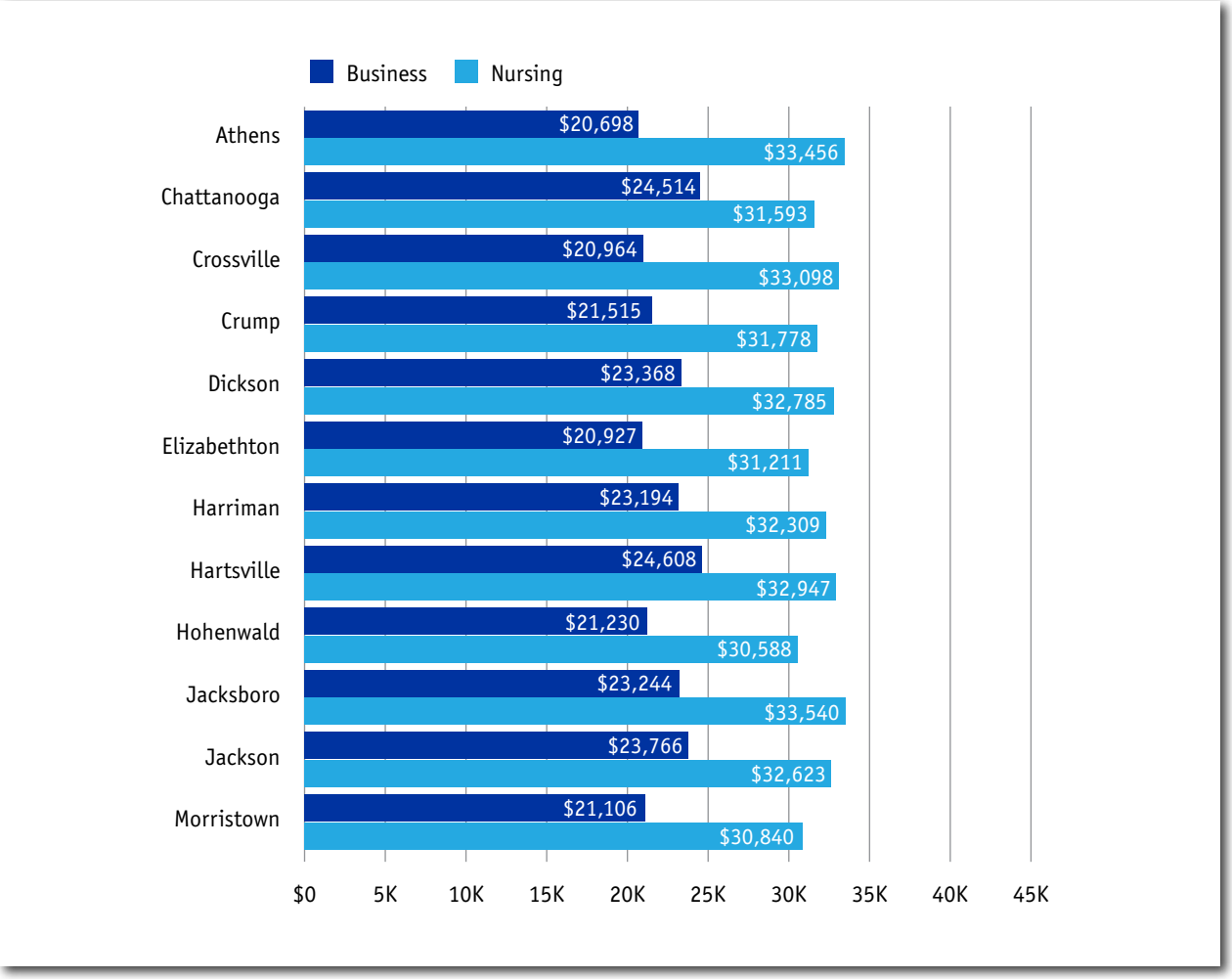
Nursing and Business Operations Support and Assistant Services were two of the programs with the largest numbers of completers. Figure 6 shows the median wages of diploma completers at Year 1 in these two fields at 12 TCAT campuses.

Wages vary more by field than they do by institution. The importance of program of study is evident by the fact that completers with diplomas in Nursing consistently achieved wages that were higher than those achieved by their counterparts with diplomas in Business Administration. Differences in wages at Year 1 were as much as $13,000 and usually hovered around $10,000.

In Nursing, median wages across completers from different institutions differed by about $3,000, ranging from just above $30,000 (TCATs at Morristown and Hohenwald) to more than $33,000 (TCATs at Jacksboro, Crossville, and Athens). In Business, median wages across completers from different institutions differed by about $4,000, ranging from around $20,000 (TCATs at Athens, Crossville, and Elizabethton) to more than $24,000 (TCAT at Hartsville).

Some of the differences across campuses may be driven by differences in cost of living or the strength of the local labor market. With the help of the EduTrendsTN website (http://www.edutrendstn.com), students can learn more about their expected wages before they enroll. This is particularly important if they plan to borrow to pay for their education.

Figure 6: Median Wages at Year 1 for Diploma Completers in Business or Nursing Programs, by Selected TCAT Campuses



Associate's Degrees

The associate's degree is the second most commonly granted postsecondary credential in Tennessee. Community colleges—the postsecondary institutions that in Tennessee and in the nation grant the majority of associate's degrees—serve several functions. Many community college students who pursue associate's degrees desire to transfer to a 4-year university, and the associate's degree is a stepping stone toward that goal. Many other students enroll in community colleges to learn a specific set of skills that prepares them for direct entry into the job market. In many states with which College Measures has worked, graduates who completed technical career-oriented associate's degrees earn more than graduates of liberal arts-oriented associate's *and* bachelor's degree programs.[15]

Table 3 shows the median wages and percent growth at Years 1 and 5 for those who earned associate's degrees in the 10 instructional programs with the largest number of graduates in the state. Data on the median wages and growth of wages for bachelor's graduates are provided for comparison. As in Tables 1 and 2, the rows with bolded text in Table 3 identify the respective state medians for the three measures, and red text highlights data that fall below the respective state median for associate's degrees.

Graduates from four of the 10 programs—Business Administration, Business Operations, Liberal Arts, and Management Information Services—had median wages at Years 1 and 5 that were below the state median for associate's degrees. Of these four, graduates with associate's degrees in Management Information Services experienced the lowest rate of growth among any of the 10 programs.

The field with the highest median wage in Year 5 (more than $61,000) and the most rapid rate of wage growth (about 46%) was Electrical Engineering Technologies/Technicians. At the end of Year 1, graduates in this field earned about $5,000 more than the median wage for all associate's graduates and $7,000 more than the median wage of bachelor's graduates. Five years after graduating, thanks to a 46% increase in wages, associate's graduates in Electrical Engineering Technologies/Technicians earned almost $20,000 more than the state median for all associate's *and* all bachelor's graduates statewide—and about $12,000 ahead of Allied Health and Medical Assisting Services graduates and $7,000 ahead of Nursing graduates (two of the highest overall paying fields in the study).

In contrast, the two lowest paid sets of associate's graduates held degrees in Business Operations Support and Assistant Services (around $25,000) and Liberal Arts and Sciences, General Studies, and Humanities (just less than $28,000). At the end of Year 5, associate's graduates in liberal arts earned more (around $35,000) than their counterparts in business operations (less than $30,000).

15 See *Higher Education Pays: But a Lot More for Some Graduates Than for Others* (http://www.air.org/resource/higher-education-pays-lot-more-some-graduates-others)

Table 3: Median Wages and Percent Change 1 and 5 Years After Completing Associate's Degrees, by the 10 Programs With the Largest Numbers of Completers

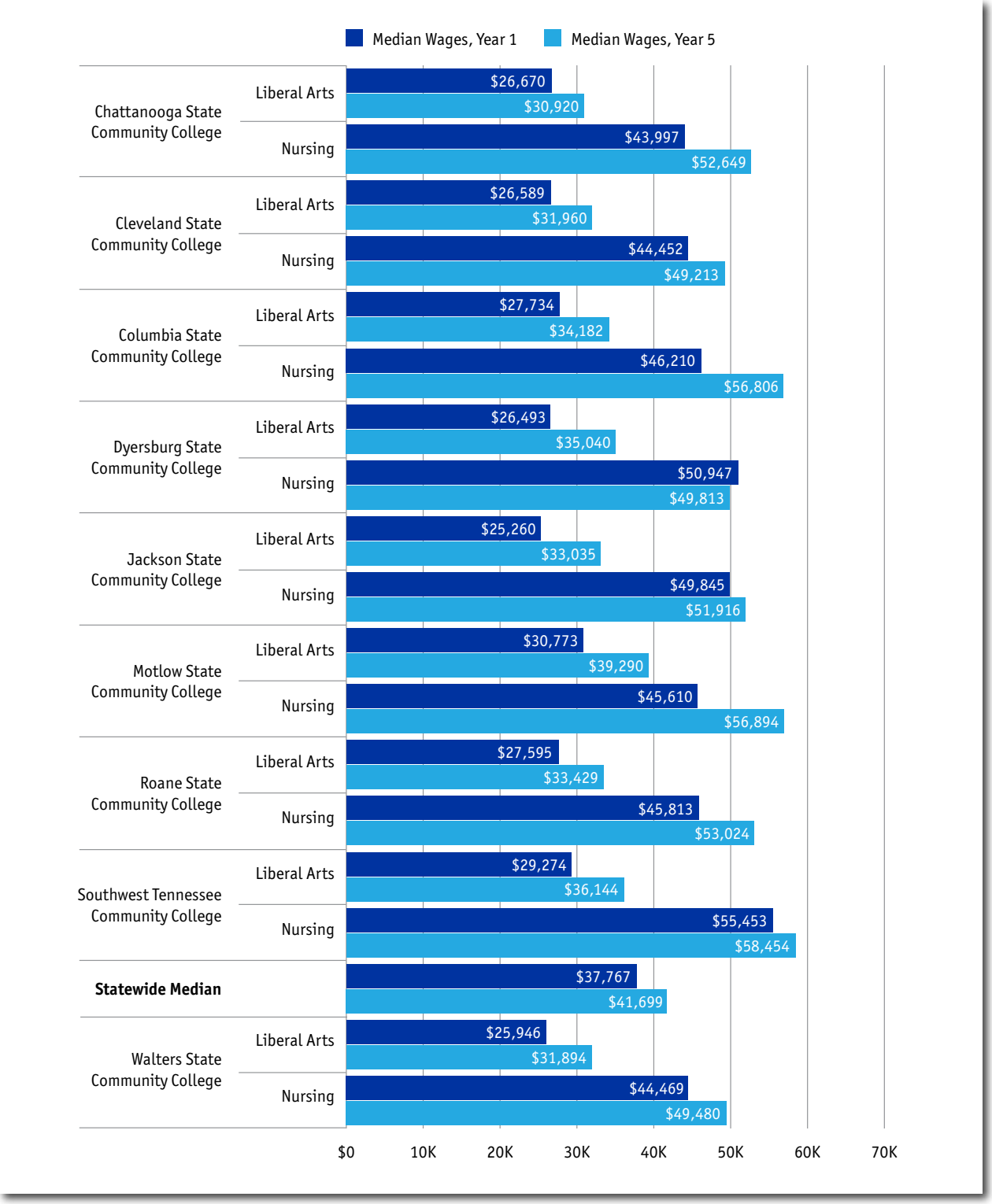
Program	Median Wages, Year 1	Median Wages, Year 5	% Change From Year 1 to Year 5
Business Operations Support and Assistant Services	$25,732	$28,500	10.8%
Liberal Arts and Sciences, General Studies, and Humanities	$27,970	$35,169	25.7%
Business Administration, Management, and Operations	$31,365	$35,069	11.8%
Statewide Median Bachelor's Degree	**$34,262**	**$41,888**	**22.3%**
Management Information Systems and Services	$36,781	$38,353	4.3%
Statewide Median Associate's Degree	**$37,767**	**$41,699**	**10.4%**
Technology Education/Industrial Arts Programs	$39,088	$42,784	9.5%
Allied Health Diagnostic, Intervention, and Treatment Professions	$39,776	$43,422	9.2%
Industrial Production Technologies/Technicians	$41,383	$46,172	11.6%
Electrical Engineering Technologies/Technicians	$42,042	$61,550	46.4%
Allied Health and Medical Assisting Services	$42,662	$49,271	15.5%
Nursing	$47,312	$54,340	14.9%

Note: Entries in red highlight data that fall below the respective state median for associate's degrees.

Figure 7 shows the variation across community colleges in the wages of graduates from the fields of Nursing and Liberal Arts. As with other similar figures in this report, Figure 7 shows the preeminence of what a student chooses to study over where he or she chooses to study it. Associate's graduates in Nursing from every community college earned more, often far more, than their counterparts with degrees in Liberal Arts. One year after graduation, the differences were approximately $25,000 (e.g., from Dyersburg State, Jackson State, and Southwest Tennessee Community Colleges). After 5 years, the differences were more than $20,000 (e.g., from community colleges at Chattanooga, Columbia, and Southwest Tennessee).

Wages also varied across community colleges. At the end of Year 1, for example, the median wage of graduates with associate's degrees in Liberal Arts ranged from $25,000 to $30,000, a difference of $5,000. But after Year 5, the gap grew to about $8,000, ranging from around $31,000 to about $39,000. An even larger amount separated the wages of graduates with associate's degrees in Nursing. Here, wages after Year 1 ranged from around $44,000 to $55,000, a difference of about $11,000. At Year 5, the gap decreased somewhat, ranging from $49,000 to $58,000. So, although what one studies matters most for wages, where he or she studies it also has an effect.

Figure 7: Median Wages 1 and 5 Years After Graduating With Associate's Degrees in Liberal Arts or Nursing, by Institution



Bachelor's Degrees

The bachelor's degree is the most commonly awarded postsecondary credential in Tennessee and the nation. Historically, the bachelor's degree has been an excellent investment for students, because those with bachelor's degrees usually experience a large wage boost compared with high school graduates and those who earn subbaccalaureate credentials.

However, not all bachelor's degrees are created equal in economic terms. Wages of graduates with bachelor's degrees tend to vary widely by program of study and a lesser extent by institution.

This is a message of hope: If students don't get into the University of Tennessee, Knoxville—the state's flagship university—they can still graduate from many other universities across the state and do well in the labor market. But as a word of caution, *what* a student studies is usually more important than *where* he or she studies it.

Median Wages of Bachelor's Graduates by Institution

Figure 8 shows the median wages of graduates 1 and 5 years after earning a bachelor's degree. Wages of graduates from many of these campuses are clustered tightly together. Table 4 expands on this.

Of the nine state universities, the median wages of bachelor's graduates from three of them were within $500 of the state median for all bachelor's graduates. In another three, the difference from the state median was between $500 and $1,000. The largest difference was found among graduates from the University of Memphis, where the median wage of its graduates at Year 1 was $1,700 higher than the wages of all bachelor's graduates in the state. This is not surprising, since wages and the cost of living are higher in Memphis than the rest of the state.

Five years after graduation, wages increased across the board, and wage differences compared with the state median generally widened. One year after graduation, bachelor's graduates from the University of Tennessee, Knoxville; Austin Peay University; and the University of Tennessee, Martin earned roughly the same as the state median. However, 5 years after completion, wages of bachelor's graduates from these campuses fell behind the state median by around $2,000. Wages of graduates from Tennessee State University fell even further behind.

The gap in wages between bachelor's graduates from the University of Memphis and the state median widened, and bachelor's graduates from the University of Tennessee, Knoxville saw their median wages increase from below the state median to more than $2,000 above the median. But even with these widening differences, the median wages of bachelor's graduates from six of the nine institutions were within 5% of the state median at Year 5.

Figure 8: Median Wages 1 and 5 Years After Graduating With a Bachelor's Degree, By Institution

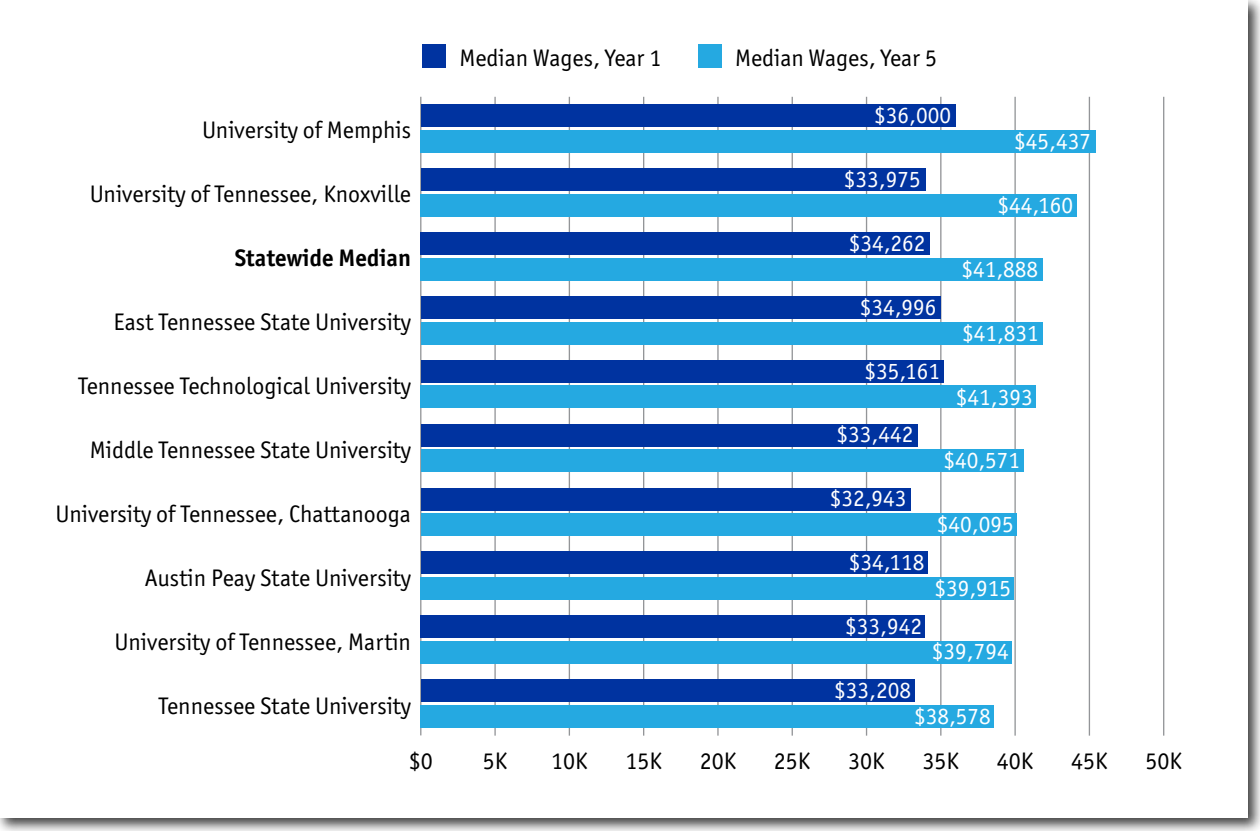


Table 4: Differences in Median Wages 1 and 5 Years After Graduating With a Bachelor's Degree Compared With the State Median, by Institution

Institution	Difference in Median Wages, Year One	Difference in Median Wages, Year 5
University of Tennessee, Chattanooga	-$1,318	-$1,794
Tennessee State University	-$1,054	-$3,311
Middle Tennessee State University	-$820	-$1,317
University of Tennessee, Martin	-$320	-$2,094
University of Tennessee, Knoxville	-$287	$2,272
Austin Peay State University	-$144	-$1,974
East Tennessee State University	$734	-$58
Tennessee Technological University	$899	-$495
University of Memphis	$1,738	$3,548

Note: Statewide median wage for bachelor's graduates at Year 1 was $34,262 and at Year 5 was $41,888. Entries in red highlight differences that fall below the respective state median for bachelor's degrees.

Median Wages of Bachelor's Graduates by Instructional Program

Table 5 shows the variance in the median wages of graduates from the 15 bachelor's instructional programs with the greatest numbers of completers. In the five academic years covered by this study, the programs ranged from around 2,200 graduates (Finance and Financial Management, Criminal Justice, and Music) to more than 6,000 (Business Administration, Multi/Interdisciplinary Studies).

As with previous tables, the row with bolded text in Table 5 identifies the respective state median for the three measures, and red text highlights data that fall below the respective state median for bachelor's degrees. Wages earned by bachelor's graduates from 8 of the 15 programs were lower than the state median 1 and 5 years after graduating. Wages earned by bachelor's graduates from four programs were higher than the state median at both years: Finance and Financial Management Services; Liberal Arts and Sciences, General Studies, and Humanities; Accounting and Related Services; and Nursing. Wages earned by bachelor's graduates moved from below to above the state median for three programs: Business Administration, Management, and Operations; Marketing; and Biology, General.

Bachelor's graduates from the Biology, General program experienced the largest percentage increase in wages over time, moving from $6,000 below the state median at Year 1 to around $1,500 above the state median at Year 5. In contrast, bachelor's graduates from the Liberal Arts and Sciences, General Studies, and Humanities program experienced a relatively slow rate of wage growth. By Year 5, their wages fell from above the state median to below it. However, in general, the relative wages of graduates from different programs were fairly stable over time.

Table 5: Median Wages and Percent Change 1 and 5 Years After Graduating With a Bachelor's Degree, by the 15 Programs With the Largest Numbers of Completers

Program	Median Wages, Year One	Median Wages, Year 5	% Change From Year One to Year 5
Psychology, General	$26,921	$34,402	27.8%
Biology, General	$28,008	$43,170	54.1%
Health and Physical Education/Fitness	$28,139	$38,281	36.0%
Communication and Media Studies	$28,844	$37,878	31.3%
English Language and Literature, General	$29,203	$38,259	31.0%
Criminal Justice and Corrections	$29,314	$37,058	26.4%
Music	$29,895	$38,475	28.7%
Political Science and Government	$30,381	$38,435	26.5%
Marketing	$32,916	$43,788	33.0%
Multi/Interdisciplinary Studies, Other	$33,693	$38,084	13.0%
Business Administration, Management and Operations	$34,067	$44,326	30.1%
Statewide Median Bachelor's Degree	**$34,262**	**$41,888**	**22.3%**
Finance and Financial Management Services	$34,384	$46,583	35.5%
Liberal Arts and Sciences, General Studies and Humanities	$35,073	$40,573	15.7%
Accounting and Related Services	$37,420	$48,943	30.8%
Nursing	$49,425	$56,112	13.5%

Note: Entries in red highlight data that fall below the respective state median for bachelor's degrees.

Variation by Bachelor's Degree Program

The data used in this report and presented on the EduTrendsTN website allow prospective students to compare wage outcomes by instructional program—for example, they can compare the wages earned by graduates from Business Administration programs across the state. This is important because students earn their degrees in specific fields from specific institutions which can affect wages.

To illustrate the extent of variance, Figure 9 shows the wages 5 years after completion in two of the largest undergraduate instructional programs offered in Tennessee: Business Administration and Multi/Interdisciplinary Studies. The figure displays median wage data for the six institutions with sufficient wage data to meet reporting requirements.

As with associate's degrees, what a bachelor's-seeking student studies is clearly important. For example, at Year 5, graduates with bachelor's degrees in Business Administration earned about $5,000 annually more than graduates with degrees in Multi/Interdisciplinary Studies. But at Year 5, the wages for bachelor's graduates from the Business Administration program at two

institutions (Austin Peay University and the University of Tennessee, Martin) lagged behind that of their peers with degrees in Multi/Interdisciplinary Studies—and in the case of wages from graduates from the University of Tennessee, Martin, the difference was close to $4,000.

Figure 9: Median Wages 5 Years After Graduating With Bachelor's Degrees in Business Administration or Multi/Interdisciplinary Studies, by Institution

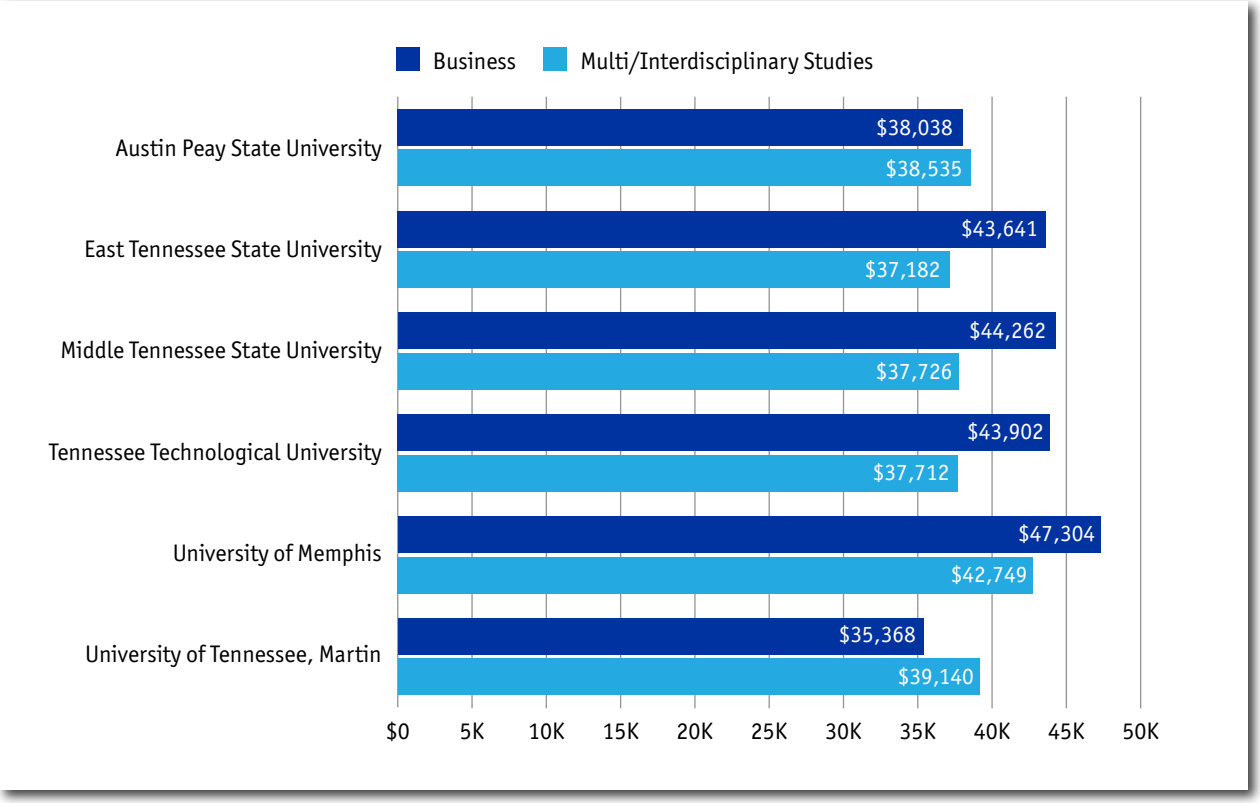
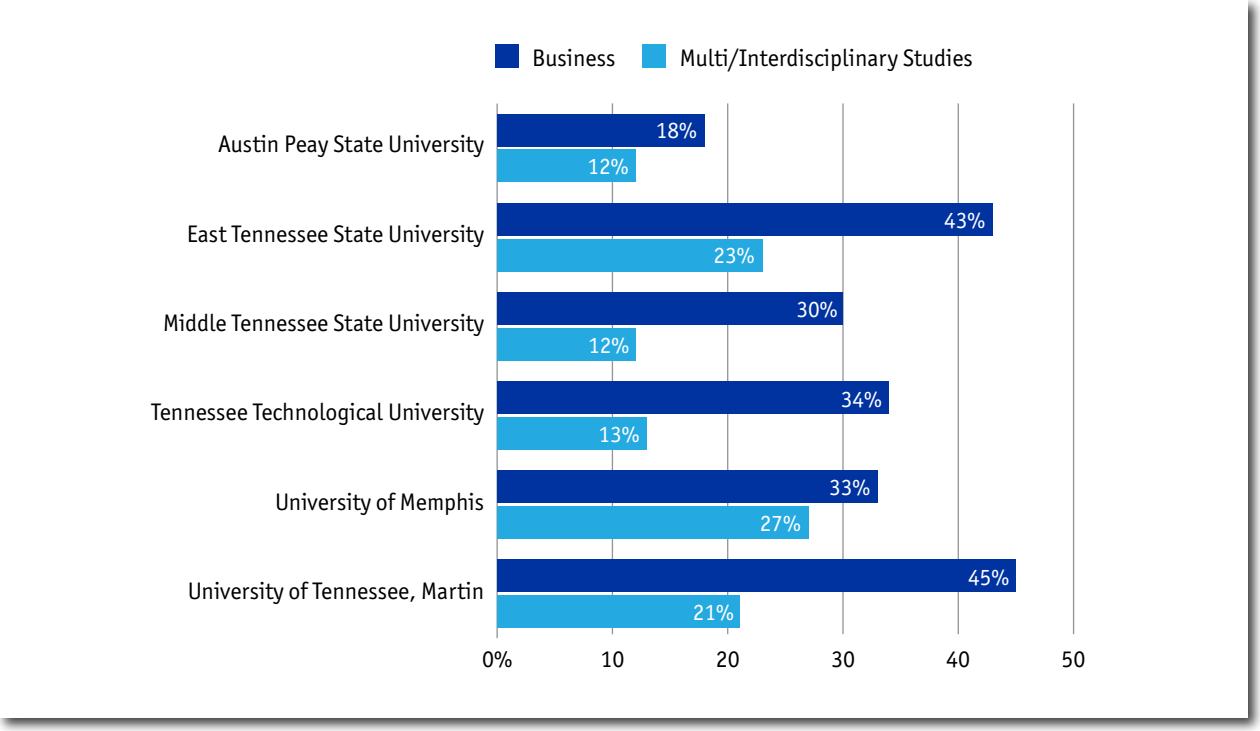


Figure 10 shows differences in the rate at which the wages of bachelor's graduates grew from Year 1 to Year 5 among those with degrees in Business Administration and Multi/Interdisciplinary Studies. For each institution, rates of growth in wages for bachelor's graduates with degrees in Business Administration exceeded those of graduates with degrees in Multi/Interdisciplinary studies. However, rates varied across programs by institution. The growth rate of wages earned by Business Administration graduates ranged from 18% (Austin Peay University) to 45% (the University of Tennessee, Martin). Similarly, the growth rate of wages earned by graduates of Multi/Interdisciplinary Studies ranged from about 12% (Austin Peay University and Middle Tennessee State University) to 27% (the University of Memphis).

Figure 10: Percent Growth in Wages From Year 1 to Year 5 Among Graduates With Bachelor's Degrees in Business Administration or Multi/Interdisciplinary Studies, by Institution



Labor Market Demand For Postsecondary Completers

As students consider their choices among programs, degree levels, and institutions, they should also consider what the job market will look like when they finish their studies.

The Tennessee Higher Education Commission is working closely with the Tennessee Department of Labor and Workforce Development to develop more information about the job market. By linking data about the demand for labor with data about postsecondary education, key questions come into focus:

- Which job opportunities will grow faster or slower?
- Which jobs will likely have the most or least demand relative to the supply of trained workers to fill them?
- Which jobs will have the highest or lowest wages?

Because labor markets vary from region to region across the state, EduTrendsTN presents labor market data at the regional and state levels. The following section highlights some of key findings from the data. More details and additional data can be reviewed at the EduTrendsTN website (http://www.edutrendstn.com).

Supply vs. Demand

The work that Tennessee has done matching projections of the supply of trained workers to the likely demand for jobs illuminates some patterns. In some programs of study, there is likely to be an oversupply of students completing training compared with the number who will likely find employment in that field. In other fields, the state projects an undersupply of completers relative to the number of likely job openings.

Table 6 displays the programs of study in which the supply of trained workers *exceeds* demand the most—that is, fields in which the competition for each job opening will likely be most intense.

Consider, for example, Cosmetology and Barbering. Around 3,500 people complete this credential every year, but this field has only about 475 annual openings. This translates to roughly seven new credential holders competing for each job, without even considering the already licensed cosmetologists who are seeking new positions. Perhaps it is not surprising that annual wages in this field are low (less than $24,000). Journalism is another field with many completers chasing a small number of job openings. Each year in Tennessee, about 1,600 graduates earn bachelor's degrees in Journalism and Broadcasting. But with only 320 or so openings per year, slightly more than five new graduates compete for each opening. While wages in the field of Journalism and Broadcasting are higher than those for Cosmetology and Barbering, they are still low relative to

other fields in which a bachelor's degree is expected. Compared with Cosmetology and Barbering, and Journalism and Broadcasting, other fields with large numbers of completers relative to openings are higher paying: Aviation Maintenance, Psychology, Mechanical Engineering, Electrical/Computer Engineering, and Business Management.

Table 6: Programs of Study With the Most Completers Relative to Job Openings

Program of Study	Average Annual Program Completers	Average Annual Openings	Ratio of Completers to Average Annual Openings	Annual Growth Rate	Usual Education Level	Average Annual Salary
Cosmetology and Barbering	3,486	475	7.34	1.5%	Postsecondary vocational training	$23,890
Journalism and Broadcasting	1,626	320	5.08	0.4%	Bachelor's degree	$33,243
Surgical Technologist	560	115	4.87	1.6%	Postsecondary vocational training	$36,134
Aviation Maintenance	477	100	4.77	0.4%	Postsecondary vocational training	$78,888
Psychology	525	125	4.20	0.9%	Doctoral degree	$81,253
Construction, Construction HVAC/Refrigeration	1,039	265	3.92	2.8%	Long-term on-the-job training	$42,891
Marketing Management	698	180	3.88	1.0%	Work experience, plus bachelor's degree	$83,879
Dramatic Arts	433	113	3.83	0.6%	Work experience, plus bachelor's degree	$45,225
Mechanical Engineering	403	125	3.22	0.2%	Bachelor's degree	$70,849
Medical Assistants	2,047	683	3.00	2.3%	Moderate-term on-the-job training	$27,230
Educational Administration	1,142	385	2.97	0.6%	Work experience, plus bachelor's degree	$68,597
Electrical/Computer Engineering	333	115	2.90	0.5%	Bachelor's degree	$81,525
Religious Activities and Education	587	210	2.80	1.3%	Bachelor's degree	$91,062
Recreation, Amusements, and Attractions	1,538	565	2.72	1.7%	Long-term on-the-job training	$29,538
Business Management	7,844	2,917	2.69	0.6%	Work experience, plus bachelor's degree	$89,944

In contrast, Table 7 shows the programs of study that have the *fewest* completers relative to demand—that is, fields in which competition for each opening should be less intense.

Table 7: Programs of Study With the Fewest Completers Relative to Job Openings

Program of Study	Average Annual Program Completers	Average Annual Openings	Ratio of Completers to Average Annual Openings	Annual Growth Rate	Usual Education Level	Average Annual Salary
Selling and Sales Management	20	7,110	0.00	0.7%	Short-term on-the-job training	$35,833
Merchandising	45	6,355	0.01	0.4%	Short-term on-the-job training	$19,787
Business Analysis	36	910	0.04	1.4%	Bachelor's degree	$71,600
Communications Development	140	2,360	0.06	1.5%	Moderate-term on-the-job training	$30,153
Construction, Construction Plumbing	46	530	0.09	1.9%	Long-term on-the-job training	$38,154
All Other Construction	199	1,970	0.10	1.7%	Moderate-term on-the-job training	$37,366
Restaurants and Food and Beverage Services	606	5,895	0.10	0.6%	Short-term on-the-job training	$19,970
Firefighting	35	340	0.10	1.4%	Long-term on-the-job training	$54,594
Accounting Administrative Support	152	1,420	0.11	1.2%	Moderate-term on-the-job training	$33,511
Human Resources	67	625	0.11	1.8%	Bachelor's degree	$44,420
Truck, Bus, Rail, Water Transportation, and Heavy Equipment	318	2,725	0.12	1.3%	Moderate-term on-the-job training	$41,260
Nursing Assistants and Home Health	220	1,838	0.12	1.9%	Short-term on-the-job training	$21,994
Technical Design and Preconstruction	85	451	0.19	1.6%	Bachelor's degree	$55,351
Construction, Construction Masonry and Concrete	55	240	0.23	2.6%	Moderate-term on-the-job training	$30,860
Plant Systems, Turf Grass/ Nursery Production	150	606	0.25	0.6%	Short-term on-the-job training	$37,151

Wages are relatively low for completers of some of these programs (e.g., Merchandising, Restaurants and Food and Beverage Services, and Nursing Assistants and Home Health). But wages are generally high among completers of other programs (e.g., Business Analyst, Technical Design and Preconstruction, and Firefighting). Note too that some fields require only short-term on-the-job training. Positions in these fields may be associated with lower wages (e.g., Merchandising, at less than $20,000). In contrast, the high-demand areas that require a bachelor's degree may also offer the highest paying positions (e.g., Technical Design and Preconstruction, at $55,000).

Tables 8 and 9 show the programs of study that Tennessee's Department of Labor and Workforce Development has identified as leading to the lowest and highest paying jobs.

Four of the lowest paying programs of study have average annual wages of less than $20,000: Early Childhood Development and Services Career, Personal and Home Care, Merchandising, and Restaurants and Food and Beverage Services. All of these typically require only short-term on-the-job training. Indeed, all six of the lowest paying programs of study require only this type of training. Of these 15 lowest paying programs of study, only two are characterized by traditional postsecondary training—Medical Records Technician (associate's degree) and Human Services (master's degree). In contrast, 14 of the 15 highest paying programs of study usually require a postsecondary credential; Aviation Flight is the only exception. Indeed, the three highest paying programs of study (Law, Pharmacist, and Physician) all require first-professional degrees.

Table 8: Programs of Study That Lead to the Lowest Paying Jobs

Program of Study	Average Annual Program Completers	Average Annual Openings	Ratio of Completers to Average Annual Openings	Annual Growth Rate	Usual Education Level	Average Annual Salary
Early Childhood Development and Services Career	439	2,270	0.2	1.2%	Short-term on-the-job training	$17,543
Personal and Home Care	0	1,265	0	5.3%	Short-term on-the-job training	$18,594
Merchandising	45	6,355	0	0.4%	Short-term on-the-job training	$19,787
Restaurants and Food and Beverage Services	606	5,895	0.1	0.6%	Short-term on-the-job training	$19,970
Nursing Assistants and Home Health	220	1,838	0.1	1.9%	Short-term on-the-job training	$21,994
Veterinary Technology	132	305	0.4	1.6%	Short-term on-the-job training	$22,900
Cosmetology and Barbering	3,486	475	7.3	1.5%	Postsecondary vocational training	$23,890
Travel and Tourism	2	135	0	0.9%	Moderate-term on-the-job training	$24,246
Medical Assistants	2,047	683	3	2.3%	Moderate-term on-the-job training	$27,230
Pharmacy Assisting	630	550	1.1	2.1%	Moderate-term on-the-job training	$27,713
Medical Records Technician	397	180	2.2	2.0%	Associate degree	$27,793
Banking and Finance Support Services	0	1,460	0	1.0%	Short-term on-the-job training	$28,165
Channel Management	0	700	0	0.7%	Short-term on-the-job training	$28,213
Lodging	122	585	0.2	0.9%	Short-term on-the-job training	$28,893
Human Services	752	685	1.1	1.4%	Master's degree	$28,946

Table 9: Programs of Study That Lead to the Highest Paying Jobs

Program of Study	Average Annual Program Completers	Average Annual Openings	Ratio of Completers to Average Annual Openings	Annual Growth Rate	Usual Education Level	Average Annual Salary
Business Analysis	36	910	0	1.4%	Bachelor's degree	$71,600
Occupational Therapy	147	120	1.2	2.6%	Bachelor's degree	$72,665
Aviation Flight	109	130	0.8	0.3%	Long-term on-the-job training	$77,050
Physical Therapy	213	215	1	2.3%	Master's degree	$77,769
Aviation Maintenance	477	100	4.8	0.4%	Postsecondary vocational training	$78,888
All Other Engineers	193	155	1.2	0.9%	Bachelor's degree	$80,847
Psychology	525	125	4.2	0.9%	Doctoral degree	$81,253
Electrical/Computer Engineering	333	115	2.9	0.5%	Bachelor's degree	$81,525
Public and Nonprofit Management and Administration	1162	534	2.2	0.8%	Work experience, plus bachelor's degree	$82,023
Marketing Management	698	180	3.9	1.0%	Work experience, plus bachelor's degree	$83,879
Business Management	7,844	2,917	2.7	0.6%	Work experience, plus bachelor's degree	$89,944
Religious Activities and Education	587	210	2.8	1.3%	Bachelor's degree	$91,062
Law	505	310	1.6	1.0%	First-professional degree	$103,410
Pharmacist	422	335	1.3	1.7%	First-professional degree	$114,258
Physician and Surgeon	556	555	1	2.3%	First-professional degree	$148,163

Conclusions

Lessons Learned

Many lessons are embedded in this report for state policymakers, as well as for students and their families.

For states, linking wage data to student data can clearly yield valuable insights into the likely labor market success of completers from the programs and campuses across the state. The data can also provide insights into the return on investment in higher education that taxpayers and students can expect to realize.

About half of the states in the nation link wage data to student data. But only a handful, including Tennessee, makes these data publicly available. Given the wide variation in the wage outcomes across programs, degree levels, and institutions—many of which are not intuitively obvious—states that have not made these data public should do so.

According to the U.S. Census Bureau, the median household income for Tennessee was around $43,000 in 2012. This is not much different than the median wages of students who completed associate's degrees or long-term (1–2 year) certificates 5 years ago. In the long run, bachelor's degrees have wage premiums higher than subbaccalaureate credentials. But for students lacking the time, money, or inclination to pursue a 4-year degree, the evidence suggests that many subbaccalaureate credentials can put completers into good jobs with solid middle class wages.

Students and their families want and need this information. Student debt is mounting, and the ability to pay off this debt depends on wages. So, prospective students need to be as well-informed as possible about every aspect of their choice of program, degree, and institution. In short, students have the right to know before they go and the right to know before they owe.

States also need to consider what other types of outcome data are valuable to policymakers, taxpayers, and students. Postsecondary education should be, as its name implies, about education. The nation and individual states need data about what students *learn* as well as what they *earn*.

While any move to assess postsecondary learning is fraught with many issues, measuring what and how much students have learned is fundamental to the entire postsecondary education enterprise. This becomes even more important as more and more states and institutions of higher education move toward competency-based education, where what a student knows rather than how much time he or she spends in a classroom becomes the building block of earning a credential. In addition to making wage and learning outcome data easily available, states also need to consider just how important it is to their postsecondary policies to assess other non-economic returns on higher education, such as voter participation, community involvement, and the like.

Tennessee is one of the nation's leading states in "outcomes-based funding"—that is, tying levels of funding to measures of student success. Right now, this practice is based on measures of student success while attending postsecondary institutions (e.g., how many students complete how many credits, how many students graduate). As more research and experiences with measuring the postcompletion success of students become available, states will likely need to consider how these outcomes data should affect funding decisions.

Finally, compared with the data from Tennessee in the report from College Measures that was released in 2012, this report shows longer term wage outcomes. But securing data on the wages of completers who have left the state for employment has been difficult. This is of particular concern for Tennessee, which, along with Missouri, shares its borders with more states than any other state in the nation. In the near future, College Measures plans to release out-of-state wages of which Tennessee has been working to obtain through the Wage Record Interchange System. Policymakers are rightfully concerned with how their investments in higher education contribute to the quality of the state's own workforce. But the full picture of a program's or an institution's contribution to the success of its completers in the labor market requires measuring the wages of completers who commute across state lines or who have moved to another state for employment.

Higher Education Pays: But More for Some Than for Others

The U.S. Bureau of Labor Statistics and the U.S. Census Bureau have documented a "big payoff" for higher education.[16] But this report shows that the payoff varies considerably from program to program and from institution to institution. The bottom line: The degrees students earn, the fields in which they earn those degrees, and where they enroll to study, all matter.

Most notably, there are many pathways to success. For example, the high labor market value of many subbaccalaureate credentials is abundantly clear. Indeed, certain certificates may represent an efficient pathway into the labor market. At the bachelor's degree level, data show that graduates from many institutions in Tennessee—not just the state's best-known campuses—earn on average roughly the same wages at Year 1 and Year 5.

In short, Tennessee's labor market offers many pathways to good wages by credential completers. The data being made available by this report and the EduTrendsTN website should help students find those pathways.

16 See *The Big Payoff: Educational Attainment and Synthetic Estimates of Work-Life Earnings* (http://www.census.gov/prod/2002pubs/p23-210.pdf) and *Education and Synthetic Work-Life Earnings Estimates* (http://www.census.gov/prod/2011pubs/acs-14.pdf).

As students and others consider these data, some of the cautions put forward earlier in this report should be reiterated. This report clearly identifies wide variations in the financial success of students completing different programs. But these variations are not fully explained, leaving this issue for further analysis. For example, the credentials of incoming students vary across institutions; missions vary across institutions; and many schools serve regional labor markets where wages vary. The relative impact of these and other factors deserves further examination.

Although this report extended the time horizon for measuring wages to 5 years after program completion, the wage data reported here are still relatively short term. Even in this 5-year period, graduates with bachelor's degrees tended to increase their wages faster than those with subbaccalaureate credentials, so the wage differential in favor of those with subbaccalaureate credentials may erode over time. For example, students with diplomas in Electrical/Electronics Maintenance and Repair Technology, Ground Transportation, Heavy/Industrial Equipment Maintenance Technologies, and Precision Metal Working all had wage increases of well over 20% from Year 1 to Year 5. This increase is several percentage points higher than the average wage increase for bachelor's graduates. Is this the end of the story, or will the wage differential "flip" in favor of bachelor's graduates when the postcompletion follow-up period is extended even further? This is why studying wage outcomes by *program and field of study* matters.

Finally, postsecondary education has many rewards beyond a boost in wages. However, if a student borrows $50,000 and earns $25,000 upon graduation, he or she will likely be consumed by trying to pay off the loans and have little time to enjoy many of the other rewards.

To reiterate, knowing about the variation in the economic payoff of programs and degrees is important—and further analysis may be needed to better understand specific implications and nuances at the institutional and program levels. But the data reported here should be made widely available to the public and should inform students, their families, their guidance counselors, taxpayers, and policymakers about the labor market outcomes of programs, degree levels, and institutions.

Technical Appendix

Defining a Cohort

In this report, the universe of data includes completers from the Tennessee Higher Education Commission's Student Information System. For this report, we used two cohorts of students based on the semester the graduate received the award.[17] These are:

1. 2007–11 for first year out earnings

2. 2007 for Year 5 earnings

The 2007–11 academic years equate to summer 2006 through spring 2011.

Data for each completer is compared with the completer's school, award level, and the Classification of Instructional Program (CIP) major code for the first major only. For this report, we aggregated information to the 4-digit CIP code to reduce the number of records that needed suppression. If the student had multiple awards, the most recent award was used.

Number of Completers

The total number of students who graduated from the program in the cohort.

Median Wages, Year 1

Wage data are based on linking Social Security numbers of graduates to wage data from the Unemployment Insurance wage file. The award semester was converted based on a calendar year quarter (e.g., spring = Q2, summer = Q3, fall = Q4).

Completers were included in the cohort if their total quarterly (Q) wages from Q3 to Q6 after graduation met or exceeded the minimum wage threshold. The Q3–Q6 wages were then summed to get a yearly wage. The quarterly minimum wage threshold was based on a 40-hour work week at the federal minimum wage for that quarter.

Median Wages, Year 5

Earnings data are based on linking social security numbers of graduates to wage data from the Unemployment Insurance wage file. The award semester was converted based on a calendar year quarter (e.g., spring = Q2, summer = Q3, fall = Q4).

17 The associated website also has information on wages 3 years after completion. That cohort is based on 2007–09 completers.

Completers were included in the cohort if their total quarterly wages from Q19 to Q22 after graduation met or exceeded the minimum wage threshold. The Q3–Q6 earnings were then summed to get a yearly wage. The quarterly minimum wage threshold was based on a 40-hour work week at the federal minimum wage for that quarter.

Number of Completers With Wage Data

This is the number of completers in the cohort with wage data.

Instructional Program, Area of Study, Area of Study (CIP) Code, Program

The Area of Study, Area of Study Code, and Instructional Program refer to the Classification of Instructional Program (CIP) developed and maintained by the U.S. Department of Education's National Center for Education Statistics (NCES). According to NCES, "The [CIP] provides a taxonomic scheme that supports the accurate tracking and reporting of fields of study and program completions activity. CIP was originally developed by the U.S. Department of Education's [NCES] in 1980, with revisions occurring in 1985, 1990, 2000, and 2010." For more information about CIP codes, please visit NCES's website: http://nces.ed.gov/ipeds/cipcode/.

Program of Study

A program of study is a grouping of academic programs (based on the 2010 Classification of Instructional Program, or CIP codes) and associated occupations (using the 2010 Standard Occupational Classification, or SOC codes) for which they may train. Tennessee maintains approximately 207 programs of study that are based on the 16 educational clusters developed by national career and technical educators and the programs of study within those clusters in use by the Tennessee Department of Education, Career and Technical Education Division. The Tennessee Department of Labor and Workforce has subdivided some of the programs of study to more closely align educational programs and usual occupational outcomes.

Data Suppression and Exclusions

Data were suppressed where there were less than 5 completers for the school, award level, and CIP grouping and less than five completers with wage information.

Data Limitations and Disclosure Rules

The wage data included in this report represent *only* the following:

- Graduates successfully matched to the Unemployment Insurance Wage records collected by the Tennessee Department of Labor and Workforce Development.
- Graduates employed in Tennessee by an entity that reports to the Tennessee Department of Labor and Workforce Development. This excludes federal employees, including those within the U.S. Department of Defense.

Employers subject to the Unemployment Tax must be registered and file with the Tennessee Department of Labor and Workforce Development if they meet one of the following criteria:

- One or more employees (10 employees if your operation is agricultural) for some portion of a day during any 20 different weeks in a calendar year.
- A $1,500 or more total gross quarterly payroll ($20,000 if your business is agricultural; $1,000 if domestic labor).
- Acquired a business subject to this tax.
- Been subject to the Federal Unemployment Tax.
- Are a governmental operation or political subdivision.
- A non-profit organization under Section 501(c)(3) of the Internal Revenue Code and had four or more employees for some portion of a day during any 20 different weeks in a calendar year.

These criteria mean that individuals working as consultants and independent contractors (including many psychologists, counselors, barbers, and cosmetologists) may be excluded, as are a list of others that may be found at http://www.tn.gov/labor-wfd/es/Employers/forms/HandbookforEmployers2013.pdf.

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