

DATE: January 26, 2012**SUBJECT:** University of Tennessee Center for Business and Economic Research – *The Transition from College to Career in Tennessee***ACTION RECOMMENDED:** Information

BACKGROUND INFORMATION: The Tennessee economy’s ability to compete with the rest of the U.S. and the world depends crucially on the state’s ability to develop and retain a highly skilled labor force. The state’s two-year and four-year institutions of higher education are key components of the state’s strategy to create and sustain an amply-skilled labor force. In 2011, the University of Tennessee – Knoxville’s Center for Business and Economic Research (CBER) initiated a series of studies for HCM Strategists, The Gates Foundation, and the Tennessee Higher Education Commission (THEC) on the determinants of student success in college and beyond.

The attached report summarizes some of the results of these studies, focusing on student transitions from Tennessee public institutions of higher education to the Tennessee workforce.

CBER undertakes an analysis of all students who began as first-time freshmen at any one of the state’s public institutions of higher education in 2002 for the 2002/2003 school year and in 2003 for school year 2003/04. A series of important outcomes for these students is explored, including their:

- persistence through college;
- degree completion;
- likelihood of working in the Tennessee economy; and
- earnings, if they are working in the Tennessee economy.

The report begins with a discussion of data used in this study as well as descriptive statistics for 2002 and 2003 first-time freshmen in Tennessee. This is followed by a summary of statistical analyses that explain which characteristics are most closely linked to workforce participation and earnings shortly after college. The last section offers conclusions, policy implications, and opportunities for additional research.

THE TRANSITION FROM COLLEGE TO CAREER IN TENNESSEE¹

Celeste K. Carruthers

Assistant Professor, CBER

William F. Fox

Director, CBER

Matthew N. Murray

Associate Director, CBER

Angela R. Thacker

Research Associate, CBER

¹ We thank the Tennessee Higher Education Commission for providing data used in this study and for providing helpful feedback throughout its progress. We are also indebted to Grant Thrall, HCM Strategists, the Gates Foundation, and other members of the Context for Success consortium for comments and suggestions on related work.

EXECUTIVE SUMMARY

The Tennessee economy's ability to compete with the rest of the U.S. and the world depends crucially on the state's ability to develop and retain a highly skilled labor force. The state's two-year and four-year institutions of higher education are key components of the state's strategy to create and sustain an amply-skilled labor force. In 2011 we initiated a series of studies for HCM Strategists, The Gates Foundation, and the Tennessee Higher Education Commission (THEC) on the determinants of student success in college and beyond.² This chapter summarizes some of the results of these studies, focusing on student transitions from Tennessee public institutions of higher education to the Tennessee workforce.

We undertake a careful analysis of all students who began as first-time freshmen at any one of the state's *public* institutions of higher education in 2002 for the 2002/2003 school year and in 2003 for school year 2003/04.³ We explore a series of important outcomes for these students, including their:

- persistence through college
- degree completion
- likelihood of working in the Tennessee economy and
- earnings if they are working in the Tennessee economy.

Each student's experience is tracked across campuses (if they chose to attend another school) and into the labor force. Thus, we follow students who begin at each campus to determine whether they obtained a degree at their initial campus or at any other public or private school in Tennessee or elsewhere in the nation. We analyze student education and work experience outcomes through the end of calendar year 2010 for both cohorts of students. Selected findings include the following:

- (1)** 72 percent of two-year college entrants and 45 percent of four-year college entrants failed to earn a degree by the spring of 2010.
- (2)** Degree recipients had higher ACT scores than noncompleters, and higher ACT scores were associated with higher earnings after college.

² See Carruthers, Celeste K., William F. Fox, Matthew N. Murray, and Angela R. Thacker. "Educational Outcomes for Students Attending Tennessee Higher Education Institutions," (forthcoming) prepared for the Tennessee Higher Education Commission and Carruthers, Celeste K., William F. Fox, Matthew N. Murray, Grant Thrall, and David Wright, "College Participation, Persistence, Graduation, and Labor Market Outcomes: An Input-Adjusted Framework for Assessing the Effectiveness of Tennessee's Higher Education Institutions," (forthcoming), prepared for the Context for Success Project, an initiative of HCM Strategists and the Gates Foundation.

³ Students are regarded as beginning in 2002 if they are first-time enrollees in the summer or fall of 2002. Students in 2003 are defined in a similar manner. Students who are dual enrolled while in high school are considered first-time enrollees when they begin higher education after graduation from high school.

- (3) Degree recipients came from neighborhoods that were more affluent and less diverse than those of noncompleters.
- (4) The vast majority of bachelor's degree recipients finished college within 150% of normal time (six years). Associate's degree recipients were less expeditious.
- (5) Four-year college noncompleters were close to minimum degree requirements, in terms of credits and semesters, but tended to stay in college just 2/3 as long as bachelor's degree recipients.
- (6) Degree recipients earned nearly \$10,000 more than noncompleters seven years after entering college.
- (7) The short-term returns to college persistence (i.e., the earnings premium for additional semesters enrolled) were positive for noncompleters but negative for degree recipients, indicating that persistence could be a good signal in the absence of a degree but excessive alongside a degree.

The report begins with a discussion of data used in this study as well as descriptive statistics for 2002 and 2003 first-time freshmen in Tennessee. This is followed by a summary of statistical analyses that explain which characteristics are most closely linked to workforce participation and earnings shortly after college. The last section offers conclusions, policy implications, and opportunities for additional research.

I. CHARACTERISTICS OF COLLEGE COMPLETERS AND NON-COMPLETERS

Data on education experiences in Tennessee public institutions of higher education were obtained from THEC administrative files. Data on workforce experience and earnings through calendar year 2010 were obtained from the Tennessee Department of Labor and Workforce Development's unemployment insurance records.⁴ We must emphasize that results only reflect the initial effects of education and graduation on earnings and workforce participation because many graduates can only be observed for a few working years after graduation. Thus, the earnings and work data tend to represent the beginning of

⁴ We are only able to examine workers who are in the Tennessee unemployment insurance system, which primarily applies to people who work for an employer and excludes people who work for themselves. Farm workers are also generally excluded. Approximately 89 percent of the state's workers are covered by the unemployment system, so we underestimate the share of graduates working in the state since we are unable to see these uncovered workers.

work life and are not necessarily indicative of the career earnings profiles.⁵ Also, our analysis is limited to students who began higher education in Tennessee. We are not analyzing the outcomes of students who did not go to college or who attended institutions outside of Tennessee.

The 2002 cohort had a total of 24,630 first-time college freshmen, including 14,625 in four-year schools and 10,005 in two-year schools. The 2003 cohort had 24,485 students, with 14,041 from four-year schools and 10,444 from two-year schools.

We divide students into four groups: those earning a bachelor's degree, those earning an associate's degree, those who stay in school for a brief period of time (defined as one semester for those entering two-year schools and two semesters for those entering four-year schools), and those staying in school longer but failing to earn a degree (henceforth, "extended non-completers"). The present discussion is focused on attributes of these four groups overall, but our related work examines student characteristics and completion outcomes across campuses as well. We find that 72 percent of Tennessee's two-year college entrants and 45 percent of four-year college entrants failed to complete a degree by the spring of 2010, seven to eight years after their initial enrollment and the last term for which we have data. Just less than 12 percent of all college-going students left after one term. Among all two-year college entrants in the 2002 and 2003 cohorts, 15 percent ultimately received an associate's degree, and 13 percent received a bachelor's degree. Among four-year college entrants, associate's degree receipt was very rare, and 53 percent received a bachelor's degree.

Students Entering Two-Year Schools

Table 1 summarizes student characteristics by completion/non-completion category. We find that nearly 60 percent of students entering Tennessee's two-year colleges were female. A little less than four-fifths of students entering two-year schools from each cohort were white, more than one-sixth were African-American and the remainder was composed of small percentages of other ethnic groups. White students were somewhat better represented among degree recipients than they were among all two-year entrants, meaning that white students were slightly more likely to go on to earn a bachelor's degree or an associate's degree.

We measure age both in terms of student's actual age upon entering college and whether they were adults when entering college. In agreement with Tennessee's new funding formula for higher

⁵ Age-earnings profiles vary systematically for different degrees, levels of educational attainment and across an individual's lifespan.

education institutions, we define adult students to be those who were at least 25 years old at the time of enrollment. Overall, two-year college students were almost 21 years old, on average, when they began, and about one-seventh were considered adults when they started. Students who ultimately earned a bachelor's degree tended to enter college slightly younger than students who earned an associate's degree. First-time adult freshmen had a higher propensity to attend only one semester, and the average age of one-term students was also high.⁶

Administrative data systems were evolving around the time these students entered college, and accordingly, ACT data are closer to comprehensive for the 2003 entering cohort.⁷ For this group of students, the average two-year college entrant scored 18.5 on the ACT. Those who went on to earn a bachelor's degree had the highest average ACT (20.2), followed by those obtaining an associate's degree (19.4). Extended non-completers earned 17.9 points, on average, and single-term non-completers typically earned just 17.4 points.

We mapped each student's pre-college address to 2000 U.S. Census records, and Table 2 describes characteristics of the neighborhoods these students originated from.⁸ Non-completers tended to come from more racially and ethnically diverse neighborhoods with lower shares of married households and lower median incomes. Bachelor's degree recipients came from higher-income neighborhoods than associate's degree recipients, although the difference was small on average. About one-half of all two-year college entrants were from neighborhoods where the median household income was less than \$36,000, which is the threshold for low-income supplements to Tennessee's lottery-funded HOPE scholarship. Statewide, the median household income was \$36,800 as of the 2000 U.S. Census, 36 percent of households were in rural areas, and 80 percent of the population was white, non-Hispanic. Thus, Tennessee's two-year college entrants came from areas that closely resembled a typical Tennessee neighborhood but tended to be slightly more affluent and less diverse.

Students Entering Four-Year Schools

Table 3 reports characteristics of students entering four-year schools. Both entering classes were slightly over one-half female, slightly less than three-fourths white, about one-fifth black, and a little over one percent Hispanic. Students entering four-year schools were much more likely to be male

⁶ This finding may be partly the result of older students being more likely to take a specific certificate program or other type of training with no intention of earning a degree.

⁷ Additionally, many students entering two-year colleges did not take the ACT.

⁸ We thank Grant Thrall, retired Professor of Geography at the University of Florida, for matching student addresses with 2000 U.S. Census data.

or black than their two-year counterparts. Much like two-year college entrants, white students were somewhat more likely to receive a bachelor's degree.

The typical four-year college student was 19 years of age when he or she entered as a first-time freshman, with less than three percent of students considered to be adults when they first entered four-year schools (compared with 13-14 percent for two-year schools). Adult students were better-represented among noncompleters than degree recipients, meaning that they were less likely to graduate than more traditional college freshmen. Students in both cohorts averaged 22 points on the ACT exam, with bachelor's degree recipients scoring 23 points on average and single-term noncompleters scoring around 20 points. The average student entered a campus that was less than 100 miles from their home. Those who attended college for one year or less tended to be closer to home than extended non-completers and degree recipients.

Table 4 summarizes features of the pre-college neighborhoods students came from as of the 2000 U.S. Census. Relative to the state as a whole, four-year college students came from neighborhoods that were 9 percentage points less likely to be rural and where the median income was about \$7,000 higher. Much like two-year college entrants, four-year entrants who ultimately completed a degree tended to come from neighborhoods with higher incomes and higher shares of white, married, and/or owner-occupied households.

Graduation and Time to Degree

Table 5 summarizes the typical duration of college enrollment for degree completers who began college in 2002 or 2003. About 20 – 23 percent of students entering two-year colleges ultimately earned an associate's degree, and 13 percent ultimately earned a bachelor's degree. These figures include 793 students (7.9%) from the 2002 cohort and 689 (6.6%) from the 2003 cohort who received both an associate's *and* a bachelor's degree. Among four-year college entrants, 53 percent earned a bachelor's degree within the window of time we observe, and 3 percent earned an associate's degree.

Although community colleges are widely known as "two-year" institutions, and other colleges and universities are known as "four-year" institutions, many students do not obtain an associate's degree within two years or a bachelor's degree within four years. Two years for an associate's degree or four years for a bachelor's degree is called "100% of normal time." Longer durations include 150% of normal time (that is, three years for an associate's or six years for a bachelor's degree) and 200% of normal time (four and eight years, respectively). Table 5 lists the percent of college enrollees who completed degrees within 100-200% of normal time or more. Only 4 percent of two-year college

entrants received an associate's degree within 100% of normal time, and an even smaller share received a bachelor's degree within four years (which almost always entailed transferring to a four-year college or university). Degree completion rates for two-year entrants rose steadily thereafter, well past 200% of normal time. Degree receipt was more common and more expeditious among four-year college entrants. One-fifth earned a bachelor's degree within four years, rising to nearly one half within six years.

How Close Were Noncompleters to Graduation?

Given the high share of students who left college without a degree, the question of how close they came to graduation arises. Although we do not assess student progress through detailed degree requirements, we can readily observe how noncompleters compared to degree recipients in terms of credits earned and semesters enrolled. This section focuses on four-year college entrants, but qualitative persistence patterns are similar for two-year college entrants.

Figure 1 illustrates the number of cumulative college credits earned by single-term noncompleters, extended noncompleters, and bachelor's degree recipients. Obviously, students who left college after no more than one academic year were quite far from graduation, earning a small share of the credits earned by degree recipients. On average, we find that extended noncompleters earned 40 – 43 percent fewer credits than degree recipients, which indicates that noncompleters were relatively far behind graduates in terms of college persistence. But with 89 – 92 cumulative credits, extended noncompleters were not far from the 120-credit benchmark that colleges typically require for bachelor's degree receipt.

Figure 2 illustrates the total number of fall and spring semesters students attended, by degree status. Extended noncompleters enrolled for seven semesters, on average, which is just one semester shy of 100% of the normal time to degree. By that measure, noncompleters exhibited lengthy college persistence. But bachelor's degree recipients tended to enroll for 10 – 11 semesters (i.e., about 150% of normal time). So if graduates are a reliable indication of how long it *usually* takes to earn a degree, extended noncompleters typically persisted for about two-thirds as long as they needed to.

II. FROM COLLEGE TO CAREER

Employment of those Entering Two-Year Schools

The previous section demonstrated that it often takes several years to complete a degree, so accordingly, we examine employment outcomes seven or more years after beginning school. This allows sufficient time for almost all students who will receive a degree to do so and still permits a brief window to see work experience. We limit our focus to students who had left college – with or without a degree – by January of 2009 for the 2002 entering cohort or January of 2010 for the 2003 cohort. Figure 3 reports the percentage of these groups employed in Tennessee seven years after starting college, by degree status. Two salient conclusions emerge. First, students who completed a degree were more likely to have Tennessee earnings seven years after entering college. And second, the effects of the 2008-2009 recession and its aftermath are evident in significantly lower labor force participation for the 2003 cohort. Compared to students who entered college just one year earlier, members of the 2003 cohort were much less likely to have Tennessee wages seven years after starting college.

Figure 4 plots average inflation-adjusted earnings seven years after starting college, by cohort and degree status. Again, we see lower wages for the later cohort and we also find that degree completers had much stronger employment outcomes, earning close to \$10,000 more than noncompleters. We expect the annual returns to education to increase for these students as time goes on and more data become available. Interestingly, associate's degree recipients earned slightly more than bachelor's degree recipients. This is partly due to the fact that associate's degree recipients tended to finish college earlier than bachelor's degree recipients, and therefore, they had more time in the labor market to find work and accumulate earnings. Our ongoing research in this area will assess longer-term earnings differentials across degree types.

Employment of those Entering Four-Year Schools

Figure 5 plots the share of four-year college entrants who had Tennessee wages seven years after starting college, by degree status and cohort. Echoing our findings for two-year enrollees, degree recipients were much more likely to be working than noncompleters, and the later cohort had lower labor force participation rates regardless of degree completion. Figure 6 plots average inflation-adjusted earnings for 2002 and 2003 four-year college entrants, by degree status and cohort. Once again, we find that degree recipients earned about \$10,000 more than non-completers.

Figures 3 – 6 illustrate the economic returns to degree completion, but also the returns to persistence through college. Recall that “single-term noncompleters,” are students who stayed no more than one semester in a community college or one academic year in a four-year college. Even though single-term noncompleters had more time out of college than any other group, and presumably more time to work, they tended to earn no more than other noncompleters, and they earned much less than degree recipients.

Student Characteristics and Employment Outcomes: Regression Analysis

Summary statistics and figures allow us to see the characteristics of incoming students and examine how average student characteristics appear to be related to degree completion and labor outcomes. However, simple statistics only permit us to relate these outcomes to one student characteristic at a time when many factors influence degree completion, employment, and earnings, and these factors are often correlated and interdependent. Thus, we use multivariate regression analysis to decompose the effects of degree completion and different student characteristics on labor market participation and earnings in Tennessee.

First, we estimate the relationship between student characteristics and labor outcomes for all students. Student characteristics include pre-college variables summarized in Tables 1 and 3 (gender, demographics, age, ACT, and distance from home) as well as the type of college a student attended (two-year or four-year) and the length of time it took him or her to complete a degree (if one was completed at all). Additionally, we control for whether a student came from a low-income neighborhood⁹ and whether a student transferred from a community college to a four-year college or university in the state.

So that we may have ample time to observe employment outcomes, we limit the analysis to members of the 2002 cohort who left college (with a degree or as a non-completer) by January 1, 2009. Note that all student characteristics are based on their values at the time of college entry (fall 2002) and all time periods are measured from the starting year of the cohort. The analysis cannot account for students who left Tennessee to work elsewhere and only includes those who work for employers covered by the state unemployment insurance system. It is important to remember that the likelihood of being employed and the wages earned are functions of both sides of the labor market. Characteristics of students and their achievements may affect their choices of majors and whether and where (in or out

⁹ In agreement with Tables 2 and 4, low-income neighborhoods are defined as areas where the median income was less than \$36,000 as of the 2000 U.S. Census.

of Tennessee) they wish to work. These same characteristics may influence employers' willingness to hire people and the wages they will pay based on expectations of worker productivity.

This discussion focuses on two labor market outcomes: Tennessee employment seven years after entering college (2009) and average Tennessee wages in that year, adjusted for inflation. We also note the effect of education outcomes on full-time employment and earnings in 2009.¹⁰

We find that a number of pre-college student characteristics are linked to the propensity to work as well as earnings. Among individuals with Tennessee earnings, each additional point on the ACT was associated with \$137 in additional 2009 earnings. We observe interesting gender gaps in labor force participation and earnings. Males were 3.0 percentage points less likely to work, other things equal, yet working males earned nearly \$3,000 more than females, on average. White students were 5.5 percentage points more likely to work than other ethnic groups, and they tended to earn \$2,183 more. Holding everything else equal, higher age upon college entry in 2002 reduced the likelihood of 2009 employment but had no significant effect on wages. Students who lived in lower-income neighborhoods before college went on to earn \$1,157 less than their more advantaged peers. Those who went to school farther away from home were generally less likely to be working in 2009, suggesting weaker linkages to statewide labor market.

Education experience and college completion are strongly linked to work-force participation and earnings. Students who first entered two-year schools in 2002 were more likely to be employed seven years later, regardless of their achievements. This could reflect those students who were already employed upon entry to a two-year school in pursuit of training or an academic award. Students who started in a two-year school and transferred to a four-year school were *less* likely to be working in 2009, relative to the rest of their cohort in two-year schools. Regressions estimate wages and the likelihood of working in 2009 for several paths through college, and results illustrate how labor outcomes for each path compare to that of extended noncompleters who persist more than one semester in a community college or more than one academic year in a four-year school. Relative to these extended noncompleters, single-term noncompleters were 5.2 percentage points less likely to work and they earned \$1,572 less in 2009 wages. Many of these single-term students may have had no intention of pursuing a degree and were instead simply seeking the consumption value of college-level coursework. Or, it may be the case that the returns to college persistence are steep. Enrolling for a short spell in college may send a negative signal to employers.

¹⁰ Full-time employment is defined as receiving at least full-time minimum wage for the fourth quarter of calendar year 2009. Full-time quarterly wages are annualized.

We find evidence of meaningful returns to degree completion. People who earned an associate's degree were more likely to work fulltime than extended non-completers, but the evidence does not suggest that earning an associate's degree faster (i.e. less than 200 percent time) is more strongly linked to employment. This finding may reflect working individuals who are pursuing employment-related education and training but are not in a position to study full time. That is to say, students who pursue an associate's degree while working tend to take longer to complete a degree, but they are also more likely to have Tennessee wages after completing college. Students who completed a bachelor's degree within four years had the highest wage premium overall, typically earning \$13,034 more than extended noncompleters.

The Returns to College Persistence: Regression Analysis

The above analysis shows that completers had higher earnings than those who failed to complete, regardless of whether they pursued a two-year or a four-year degree. This is consistent with a wealth of research supporting the "sheepskin effects" of degree receipt, in that college completers earn more than students who persisted in college – sometimes as long as degree recipients – but nonetheless failed to leave with a degree. If the returns to higher education are largely sheepskin effects, then students with no intention of finishing college (or insufficient skills to do so) may be better off in the workforce. It may be the case, however, that noncompleters can send a positive signal to future employers by persisting longer in college. In the absence of a degree, college persistence may reflect accumulated skills and intangible qualities like commitment that employers value. On the other hand, spending more time in college can be a poor signal to employers if additional semesters appear to be excessive or due to low grades.¹¹ In this section we divide the 2002 cohort into subsamples according to where they started college (in a two-year or four-year school) and whether they completed a degree. Then for each subsample of students, we estimate the effect of an additional semester in college on calendar year 2009 earnings, controlling for observable student characteristics. It is important to keep in mind that since the regressions compare people from the same group in terms of graduation outcomes, the analyses are not comparing college students with people who did not enter higher education, nor are they comparing two-year graduates to four-year graduates. Also, people who lost their job prior to

¹¹ See Flores-Lagunes, A., and A. Light. "Interpreting Degree Effects in Returns to Education." *Journal of Human Resources* 45 (2010): 439-467.

2009 or chose not to take a job in Tennessee are omitted from the earnings analysis, at least in part because we do not know whether their absence from the Tennessee labor force was voluntary.

The emphasis here is on the effects of additional education (i.e., semesters enrolled) on the earnings of people *within* the different groups of completers and non-completers: selected findings are presented in Table 6. Results generally indicate that for noncompleters who started in two-year colleges, employers valued college persistence. For each additional semester in college, a two-year college noncompleter earned \$668 higher earnings in 2009, and noncompleters who transferred to a four-year school earned even more. Noncompleters who started in four-year schools did not gain a significant sum for each additional semester, although additional analysis in the full report to THEC indicates that college persistence significantly increased the likelihood of having any Tennessee wages in 2009 – 2010 and increased 2010 wages as well.

Interestingly, the returns to college persistence as measured by the number of semesters enrolled were significantly negative for students who left college with an associate's or bachelor's degree. This suggests that employers emphasize the credential of a degree more than the amount of school *per se*. Indeed, employers may see excess semesters as a signal that students are not efficient at getting work done. It is also possible that some of those taking additional coursework were doing so because they did not see good post-education labor market opportunities.

III. CONCLUSIONS, POLICY IMPLICATIONS, AND FUTURE RESEARCH

To date, this series of studies is the most comprehensive of its kind regarding the determinants of program completion and subsequent employment and earnings by students in Tennessee public postsecondary education. In addition to presenting a wealth of descriptive information on progression, dropout, and graduation patterns, our research validates the State of Tennessee's recent emphasis on college completion and student retention. As evidenced by Figures 4 and 6, degree recipients earn nearly \$10,000 more than noncompleters seven years after completing college. Furthermore, our extended analyses of the returns to college persistence indicate that noncompleters can benefit from spending additional time in college. Unfortunately, achieving timely degree receipt appears to be a challenge for students, and extended stays in college can send a negative signal to employers. We find evidence suggesting that employers value degree receipt more than they value the amount of school *per se*.

This research also validates the public higher education funding formula committee’s emphasis on two student subpopulations of compelling interest to Tennessee – adults and low-income students. Summary statistics suggest that graduation rates were relatively low for adults, and that they were more likely to have very short spells in college. Further, the analysis indicates that a sustained policy emphasis on low income students is warranted. Coming from a low-income neighborhood is associated with a lower likelihood of degree receipt, and subsequently, lower earnings after college.

The findings summarized here present several opportunities for additional research. First, our analyses accounted only for student characteristics in predicting college completion and post-college labor force participation and earnings. Our related research indicates that some institutions are more effective than others in advancing these outcomes. Additional work is necessary to identify specific institutional characteristics and practices that lead to variance in effectiveness across campuses. Second, we were limited to examining very near-term labor market outcomes of college graduates who chose to work for Tennessee employers covered by unemployment insurance (representing approximately 89 percent of Tennessee workers). Future work will trace the wage returns to higher education over a longer period of time, and for a more comprehensive set of workers. Finally, our ongoing and future research will examine the effect of particular policies (for example, Tennessee Education Lottery scholarships) on college completion and labor market outcomes.

TABLE 1: First-Time Freshmen Entering Two-Year Colleges in 2002 and 2003

Student Characteristic	Non-Completers				Completers				Total	
	Single-Term		Multi-Term		Associates		Bachelors		2002	2003
	2002	2003	2002	2003	2002	2003	2002	2003		
Cohort	Cohort	Cohort	Cohort	Cohort	Cohort	Cohort	Cohort	Cohort	Cohort	
Male (%)	45.6	44.6	41.2	41.4	33.9	35.9	43.6	42.3	40.8	41.1
White (%)	78.0	72.4	74.7	74.2	85.7	85.4	86.7	89.1	78.4	77.4
Black (%)	18.4	23.8	21.7	21.7	10.2	10.1	9.1	5.5	17.8	18.3
Other race/ethnicity (%)	2.4	2.6	2.4	2.7	2.6	3.3	3.0	4.3	2.5	3.0
Hispanic (%)	1.2	1.2	1.2	1.4	1.6	1.1	1.3	1.1	1.3	1.3
Age as entering freshman	21.8	22.2	20.8	20.8	20.9	21.0	19.3	19.2	20.7	20.8
Older than 25 as entering freshman (%)	18.9	22.6	13.7	13.9	15.1	15.3	5.4	4.8	13.3	14.1
Composite ACT	20.4	17.4	17.8	17.9	19.1	19.4	20.0	20.2	18.6	18.5
Distance in miles between home and college*	24.9	27.9	30.9	32.8	29.6	29.7	36.5	31.7	30.8	31.5

* Where home addresses were missing, high school zip codes were used to calculate the distance between home and college.

TABLE 2: First-Time Freshmen Entering Two-Year Colleges in 2002 and 2003

Characteristics of Students' Pre-College Neighborhoods, as of the 2000 U.S. Census	Non-Completers				Completers				Total	
	Single-Term		Multi-Term		Associates		Bachelors			
	2002 Cohort	2003 Cohort	2002 Cohort	2003 Cohort	2002 Cohort	2003 Cohort	2002 Cohort	2003 Cohort	2002 Cohort	2003 Cohort
White (%)	78.7	76.6	79.6	79.9	86.4	87.1	86.9	89.5	81.5	81.7
Black (%)	18.0	20.2	17.2	16.8	10.6	10.0	9.9	7.6	15.2	15.2
Hispanic (%)	2.3	2.1	2.1	2.1	1.9	1.9	2.0	1.7	2.1	2.0
Foreign born (%)	2.6	2.5	2.6	2.6	2.3	2.3	2.5	2.3	2.5	2.5
Median age	36.1	35.8	36.0	36.1	36.7	36.7	36.6	37.0	36.2	36.3
Married households (%)	52.0	51.2	52.7	53.4	56.0	56.9	56.9	58.6	53.7	54.2
Rural households (%)	36.4	33.9	33.9	35.3	41.7	42.8	40.5	43.9	36.3	37.2
Owner-occupied housing unit with mortgage (%)	62.5	64.1	64.3	64.7	63.6	63.9	64.2	64.2	64.0	64.5
Moved to this housing unit since 1995 (%)	45.3	46.1	46.1	46.0	45.0	44.8	45.2	44.8	45.7	45.7
Housing unit built in 1990 or later (%)	22.6	22.6	24.1	24.4	25.3	26.2	26.5	28.4	24.4	24.9
Employed (% 16 and over)	58.0	57.9	59.1	59.3	59.4	59.9	60.2	60.4	59.2	59.3
Women in labor force (% of total population)	29.6	30.0	30.0	30.1	29.5	29.6	29.9	29.7	29.9	30.0
Median income (1000s)	35.6	35.9	37.6	38.1	38.0	38.6	39.6	40.4	37.7	38.2
Income below poverty line (%)	15.2	15.5	14.1	13.8	12.8	12.5	12.2	11.6	13.8	13.6
Low income (median income <=36,000 with home Census block group)	43.5	69.8	46.5	52.5	46.9	48.9	46.1	44.7	46.2	53.3
2000-2010 compounded per capita income growth rate*	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1
2000-2010 compounded population growth rate*	1.0	0.9	1.0	1.1	1.1	1.2	1.3	1.4	1.1	1.1

* Compound growth rates were calculated using the 2000 Census and 2010 Census estimates as of July 2011.

TABLE 3: First-Time Freshmen Entering Four-Year Colleges in 2002 and 2003

Student Characteristic	Non-Completers				Completers				Total	
	Single-Term		Multi-Term		Associates		Bachelors			
	2002 Cohort	2003 Cohort	2002	2003	2002	2003	2002 Cohort	2003 Cohort	2002 Cohort	2003 Cohort
			Cohort	Cohort	Cohort	Cohort				
Male (%)	49.5	47.9	49.1	47.8	37.9	41.2	41.7	43.1	45.0	45.2
White (%)	70.6	68.9	69.2	68.4	89.0	86.2	78.3	77.7	74.7	73.7
Black (%)	22.7	24.8	24.9	26.0	8.1	11.1	16.7	17.1	20.0	20.9
Other race/ethnicity (%)	4.7	4.4	4.2	4.1	1.8	2.4	3.6	3.9	3.9	4.0
Hispanic (%)	1.9	1.8	1.6	1.5	1.2	0.3	1.3	1.3	1.5	1.4
Age as entering freshman	19.4	19.6	19.0	19.0	18.6	18.6	18.5	18.5	18.8	18.8
Older than 25 as entering freshman (%)	5.8	6.2	3.3	3.6	1.5	1.7	0.8	0.8	2.2	2.4
Composite ACT	20.2	20.5	21.2	21.1	21.6	21.4	22.9	23.0	22.4	22.1
Distance in miles between home and college*	55.5	58.1	76.1	76.6	77.3	63.6	96.3	94.8	84.7	83.5

* Where home addresses were missing, high school zip codes were used to calculate the distance between home and college.

TABLE 4: First-Time Freshmen Entering Four-Year Colleges in 2002 and 2003

Characteristics of Students' Pre-College Neighborhoods, as of the 2000 U.S. Census	Non-Completers				Completers				Total	
	Single-Term		Multi-Term		Associates		Bachelors		2002	2003
	2002 Cohort	2003 Cohort	2002 Cohort	2003 Cohort	2002 Cohort	2003 Cohort	2002 Cohort	2003 Cohort	2002 Cohort	2003 Cohort
White (%)	79.1	77.1	78.4	78.0	85.1	85.3	82.8	82.6	81.0	80.5
Black (%)	17.1	18.9	17.3	18.0	11.3	11.6	13.1	13.4	14.9	15.6
Hispanic (%)	2.6	2.6	2.7	2.4	2.4	1.8	2.3	2.2	2.5	2.3
Foreign born (%)	2.9	3.0	3.6	3.3	2.5	2.4	3.5	3.3	3.4	3.3
Median age	35.7	35.4	35.3	35.4	36.4	36.6	35.8	36.0	35.6	35.7
Married households (%)	53.3	51.8	53.3	53.1	57.2	57.5	55.8	56.4	54.7	54.7
Rural households (%)	34.6	32.0	26.4	25.2	35.0	36.1	25.7	26.8	27.1	27.1
Owner-occupied housing unit with mortgage (%)	66.1	65.9	68.7	68.7	66.2	67.5	69.8	69.5	69.0	68.7
Moved to this housing unit since 1995 (%)	47.3	47.7	49.7	49.6	47.3	46.4	50.0	49.2	49.6	49.1
Housing unit built in 1990 or later (%)	25.4	24.0	26.8	26.4	27.8	28.9	29.4	28.7	28.1	27.4
Employed (% 16 and over)	59.4	58.9	61.2	61.2	60.3	61.1	62.7	62.3	61.8	61.4
Women in labor force (% of total population)	30.3	30.3	31.1	31.2	29.8	30.5	31.3	31.0	31.1	31.0
Median income (1000s)	38.6	37.9	42.2	42.5	41.7	42.4	45.5	46.4	43.6	44.0
Income below poverty line (%)	13.6	14.2	12.2	12.1	11.4	10.8	10.7	10.5	11.5	11.5
Low income (median income <=36,000 with home Census block group)	21.9	72.4	35.2	41.1	39.4	38.1	32.9	34.0	32.7	41.3
2000-2010 compounded per capita income growth rate*	1.2	1.1	1.4	1.4	1.6	1.5	1.6	1.6	1.5	1.4
2000-2010 compounded population growth rate*	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2

* Compound growth rates were calculated using the 2000 Census and 2010 Census estimates as of July 2011.

TABLE 5: Time to Degree Completion for First-Time Freshmen

	Two-Year		Four-Year		All Entering	
	2002 Cohort	2003 Cohort	2002 Cohort	2003 Cohort	2002 Cohort	2003 Cohort
Associate's obtained in ...						
100% time (%)	4.3	4.1	0.1	0.0	1.8	1.8
150% time (%)	11.5	11.2	0.7	0.4	5.1	5.0
200% time (%)	16.2	15.4	1.2	1.1	7.3	7.2
by Spring 2010 (%)	22.5	20.1	3.2	2.7	11.1	10.1
Bachelor's obtained in ...						
100% time (%)	2.1	2.2	19.2	20.1	12.2	12.4
150% time (%)	10.2	10.7	47.8	49.2	32.5	32.7
175% time (%)	12.3	12.3	51.5	52.2	35.6	35.1
200% time (%)	13.4	-	53.3	-	37.1	-

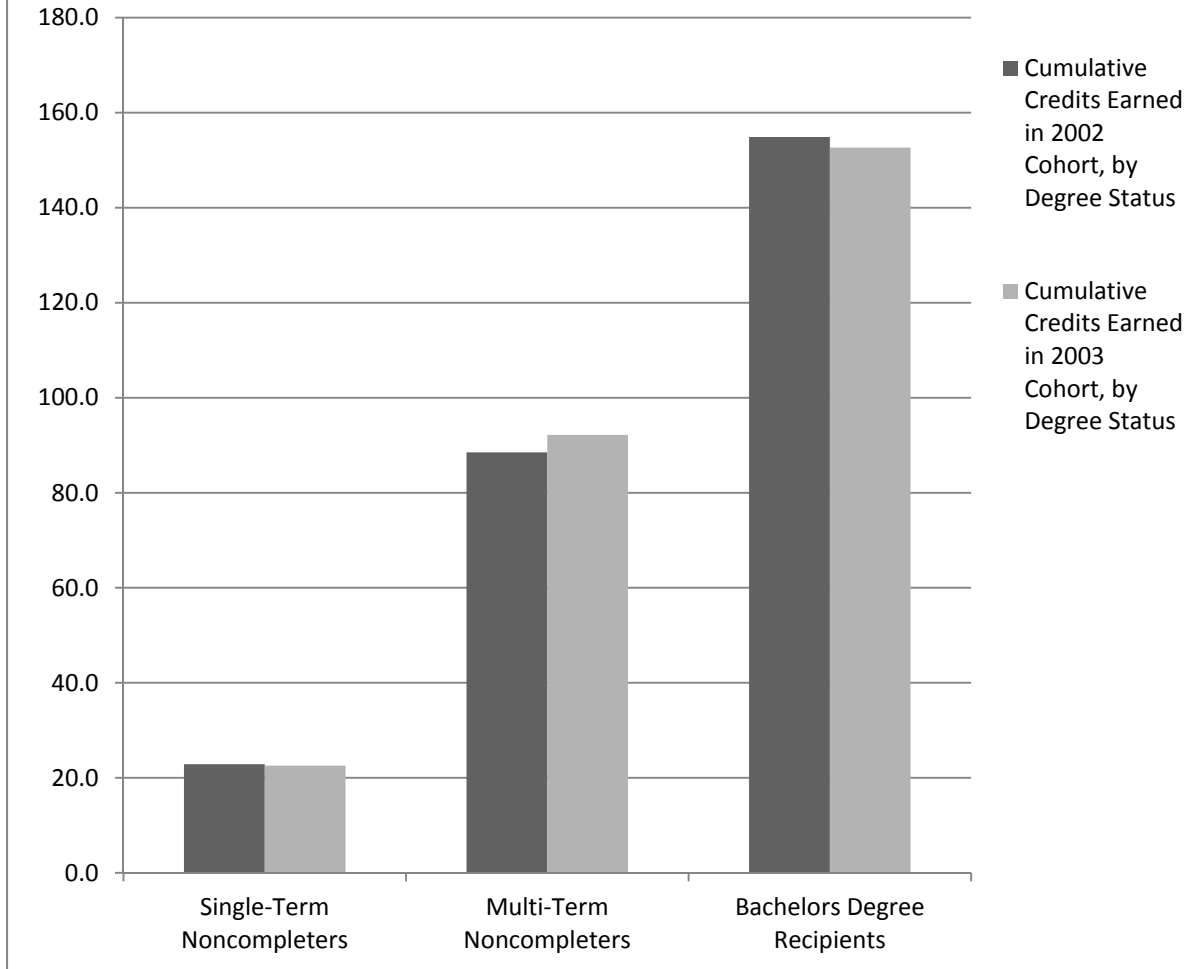
For bachelor's degrees, Spring 2010 is 200% time for the 2002 cohort and 175% time for the 2003 cohort.

For associate's degree, Spring 2010 is 400% time for the 2002 cohort and 350% time for the 2003 cohort.

Students who obtained both degrees are included in the statistics for both associate's and bachelor's degrees.

Percentages are cumulatives within degree.

Figure 1. Extended Noncompleters Earned 40 - 43 Percent Fewer Credits Than Bachelor's Degree Recipients



**Figure 2. Extended Noncompleters Enrolled for 32 - 33
Percent Fewer Semesters Than Bachelor's Degree
Recipients**

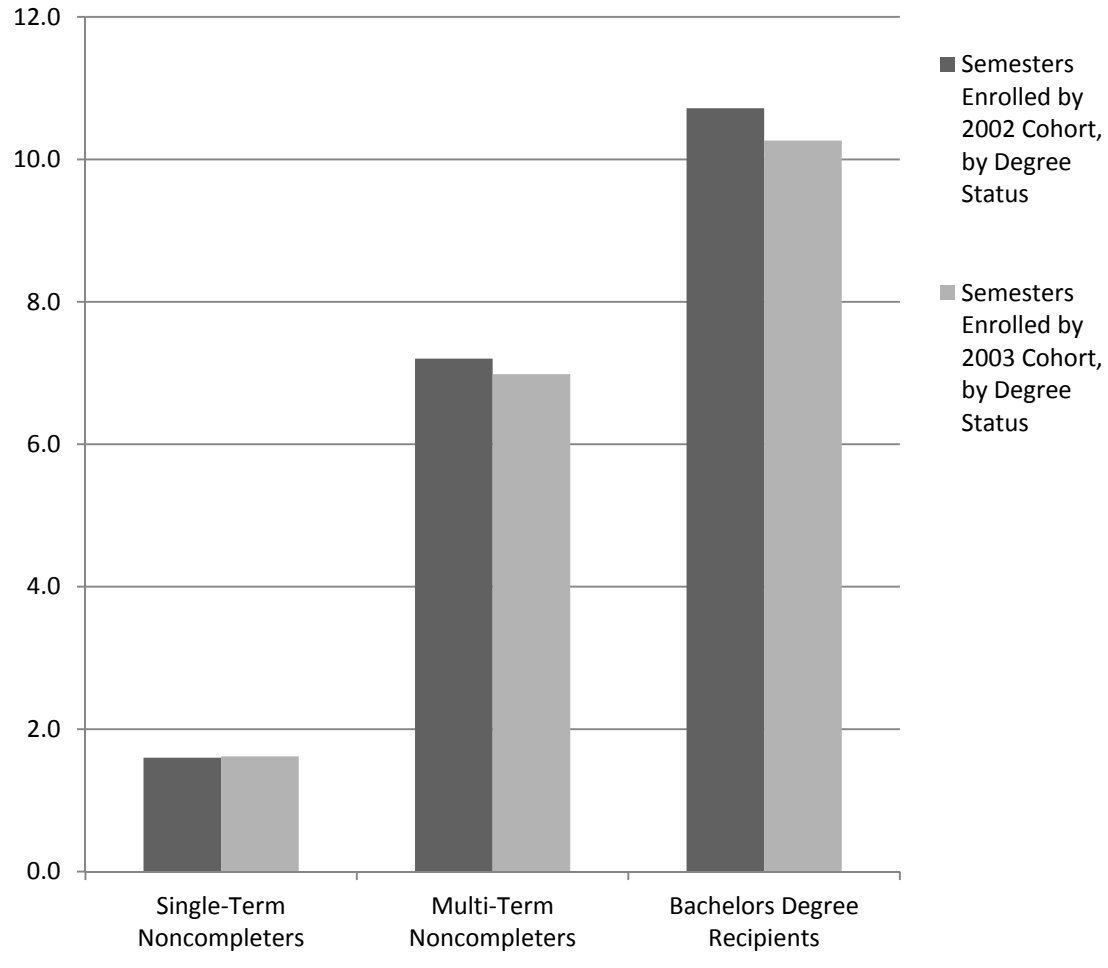


Figure 3. Degree Completers are More Likely to be Working in Tennessee Seven Years After Entering a Community College

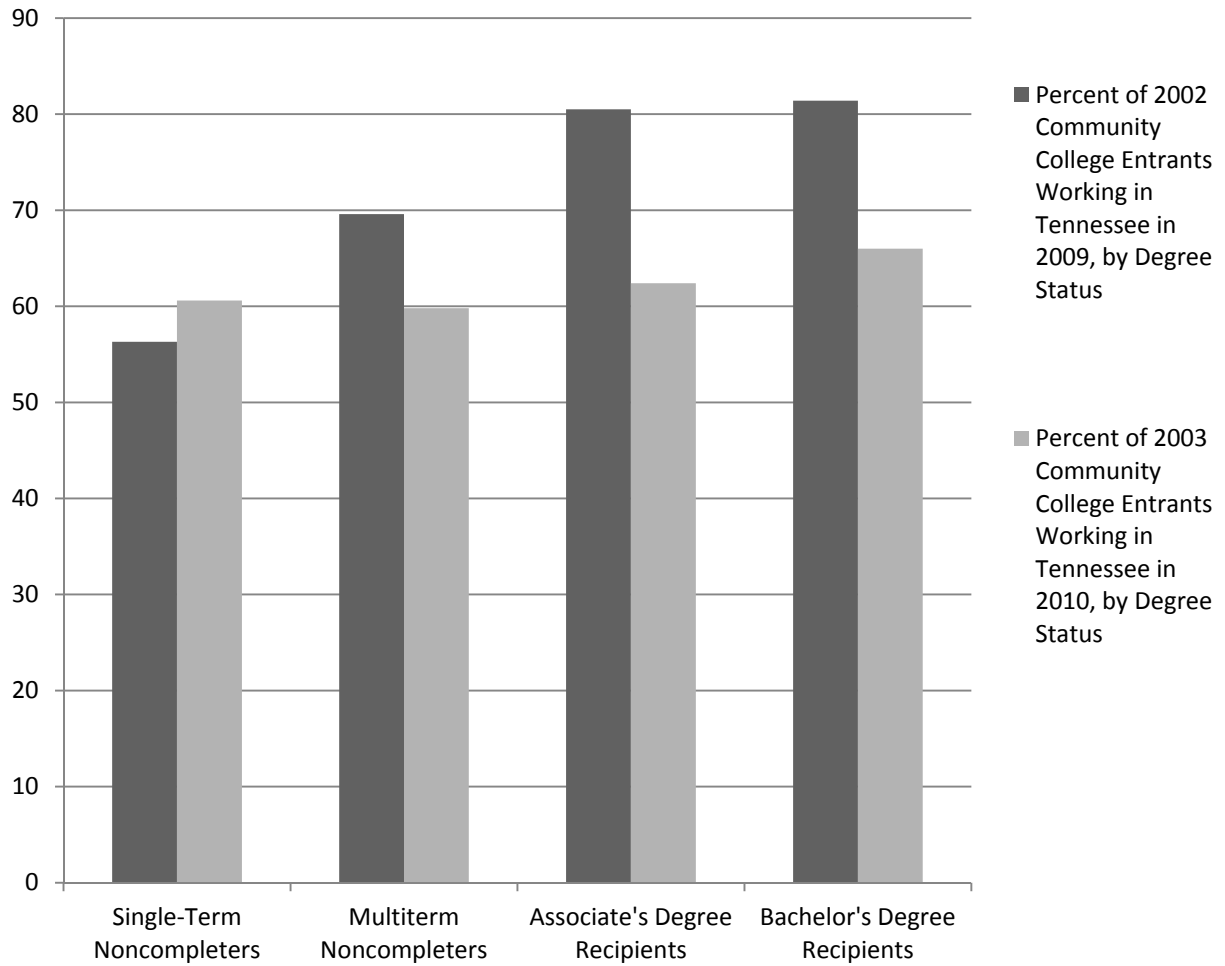


Figure 4. Degree Completers Earn Higher Wages Seven Years After Entering a Community College

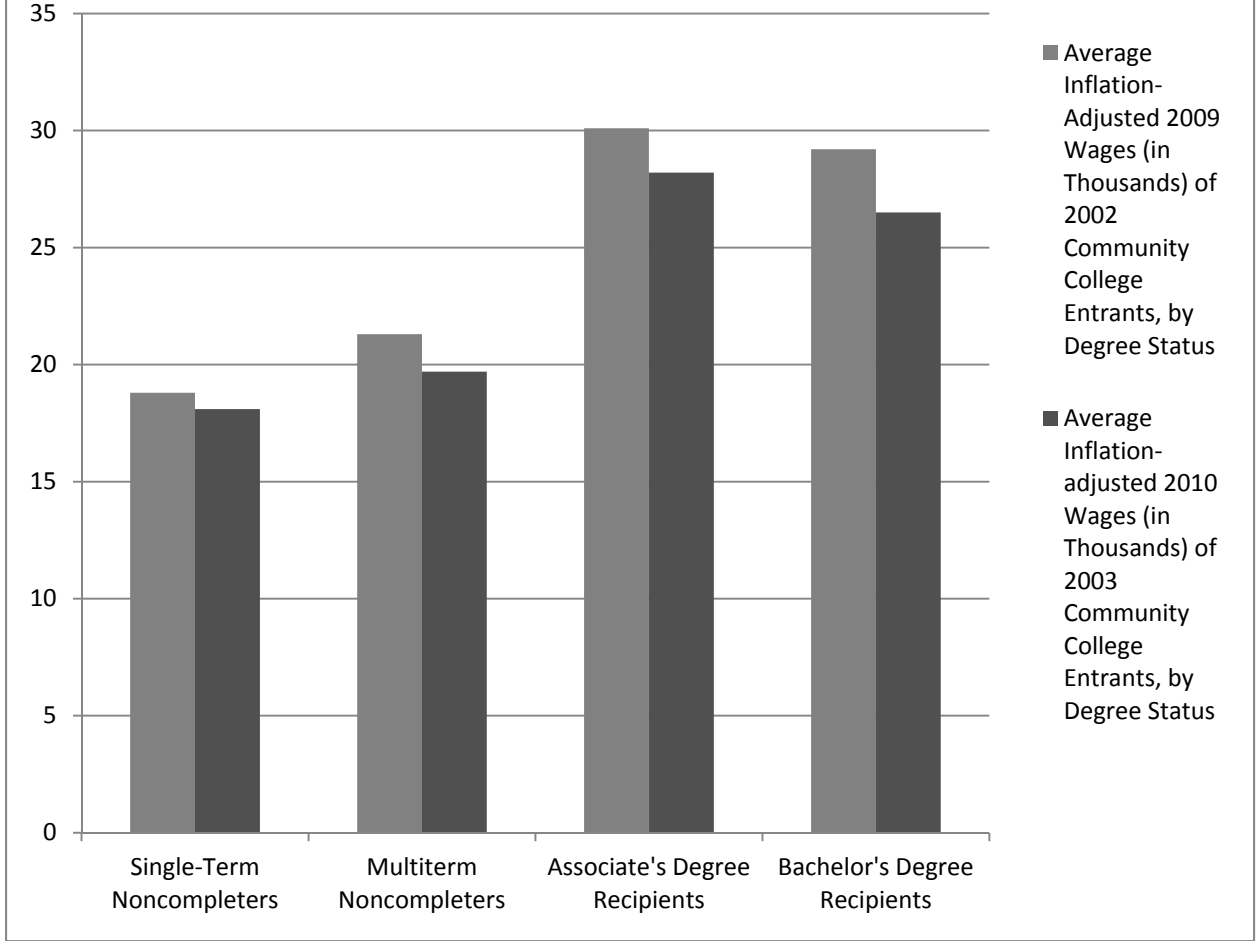


Figure 5. Degree Completers are More Likely to be Working in Tennessee Seven Years After Entering a Four-Year College or University

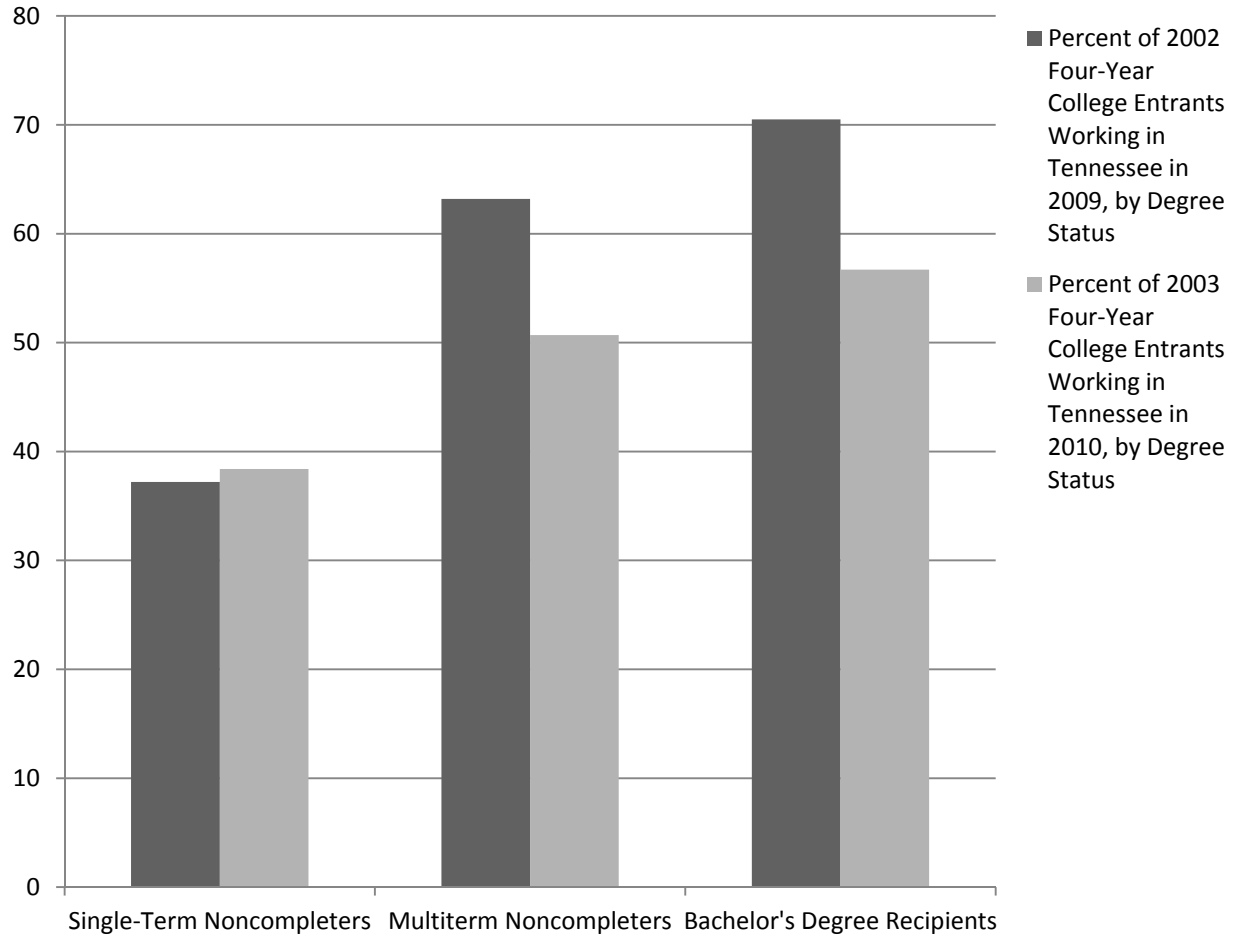


Figure 6. Degree Completers Earn Higher Wages Seven Years After Entering a Four-Year College or University

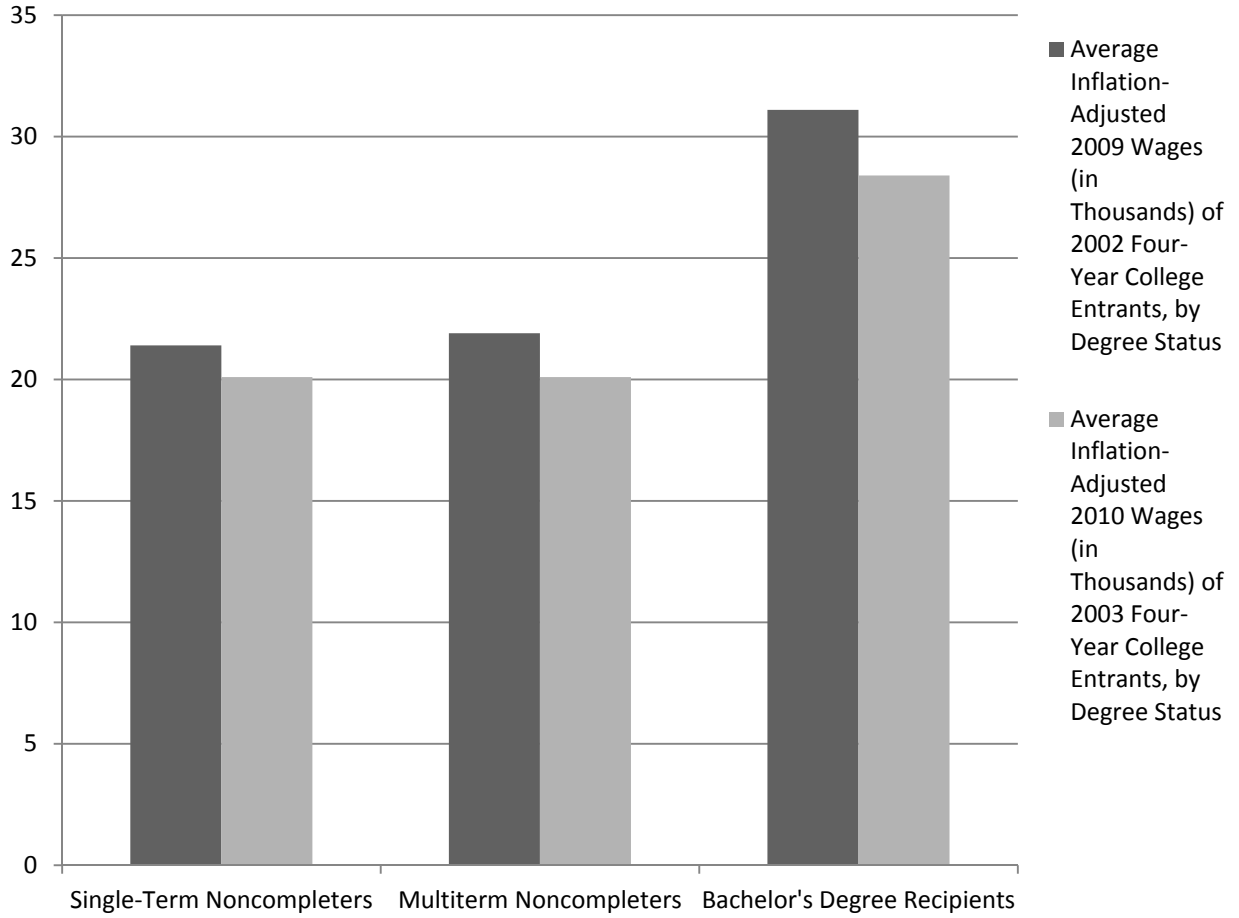


Table 6: Regression Results for the Effect of Each Additional Semester in College on Employment and Earnings, by Type of College and Completion/Noncompletion

Subsample of 2002 College Entrants	Estimated Change in Inflation-Adjusted Tennessee Wages in 2009 (if Non-Zero) for Each Additional Semester in College, 2002-2008
Noncompleters who started in two-year colleges	668*
Noncompleters who started in two-year colleges and transferred to a four-year school	985*
Noncompleters who started in four-year colleges	88
Completers who started and finished in two-year colleges	-531*
Completers who started in two-year colleges and transferred to a four-year school	-1,045*
Completers who started in four-year colleges	-1,482*

* Statistically significant