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Does It Pay to Complete Community College—and How Much?

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Going to college is one of the most important economic decisions an individual can make, and there are now hundreds of studies that have examined the economic value of a college education (Carnevale, Rose, & Cheah, 2011). Much of this research has focused on the value of four-year college degrees, which provide substantial earnings gains for those who attain them. Yet over 40 percent of college students attend community colleges and are enrolled in sub-baccalaureate programs of study. It is for these students—those who earn an associate degree or certificate or no award—that more evidence on the labor market returns to college is needed.

In this brief we review new findings from a series of extensive studies by CAPSEE researchers. The research makes use of large state datasets that include student transcripts merged with individual quarterly earnings records, which allow for the analysis of returns to particular programs and postsecondary pathways, to different types and lengths of certificates and associate degrees, and even to the accumulation of credits for students who do not complete a credential. We review analyses from eight disparate states (six of which were studied by CAPSEE researchers) and other recent evidence.

Overall, these analyses establish a "CAPSEE consensus" about the sizes of the earnings gains from sub-baccalaureate awards. They provide a more detailed picture of how community college students fair in the labor market, and show how the returns to college vary by field of study. The analyses also establish how robust these earnings gains are to broad macroeconomic trends. This brief is based primarily on the review in Belfield and Bailey (2017a).

Latest Findings on Earnings Gains

The analyses reviewed in this brief use very large datasets that merge student transcripts from statewide community college systems with information on transfer college records from the National Student Clearinghouse. These individual-level full college records are then merged with quarterly earnings data from Unemployment Insurance (UI) records spanning over 10 years of time in the labor market. The combined datasets contain many thousands of student-level college and earnings profiles across each state.

The analyses employ a fixed effects method to estimate the returns to college using longitudinal data on individuals' earnings. The return to an award is the gain in earnings in quarterly periods when the individual has an award relative to earnings in quarterly periods when that individual does not have an award. By comparing individuals with themselves across time, any person-specific attributes—such as ability or motivation—are differenced out. This fixed effects method therefore reduces the bias that is usually expected in the analysis of non-experimental data.

Gains From Completing an Associate Degree

Table 1 shows the expected quarterly earnings gain from having an associate degree versus going to college and not completing an award. The figures in Table 1 are adjusted to be comparable in terms of dollar amounts (although there are slight differences in specifications, time periods, and cohorts). Average quarterly earnings with no college award are $6,000–$8,000; the amounts in Table 1 are the additional quarterly earnings that result from having completed an associate degree.

The returns to associate degrees are strongly positive and statistically significant across each state. For each quarter after college, individual earnings are approximately $1,160 and $1,790 higher per quarter for male and female associate degree holders, respectively, than for persons who attend community college but do not complete an award. As a comparison, non-completers earn 20 credits (the equivalent of 1.67 semesters of full-time study) on average. Given that these estimates are from independent studies across different states, the results show a clear consensus that associate degree completion is generally valuable.

Table 1. Quarterly Earnings Gain for Associate Degree / Certificate Over No College Award 5–9 Years After Entry (2014 Dollars)

	Associate Degree		Certificate	
State	**Men**	**Women**	**Men**	**Women**
Kentucky	1,740	2,770	360	350
Michigan	1,560	2,540	990	670
North Carolina	1,260	2,120	530	170
California	1,650	1,650	1,440	1,440
Ohio	1,420	1,810	1,250	1,250
Virginia	910	1,350	-180[NS]	450[NS]
Washington	480	1,000	210	1,680
Arkansas	290	1,040	-380	80[NS]
State-Level Average	**1,160**	**1,790**	**530**	**740**

[NS] *Not statistically significant. Sources for each state are provided in Belfield and Bailey (2017a, Tables 1 & 2).*

Gains From Completing a Certificate

The returns to certificates across the statewide analyses are also summarized in Table 1. Overall, these estimates show positive but modest returns to the completion of a certificate. On average, the returns to male and female certificate holders are $530 and $740 per quarter, respectively. This is a positive finding given that some certificate programs are short in duration and that some certificate holders earn fewer credits than the comparison group of non-completers. However, some studies find negative returns, others find returns that are not statistically significant, and the estimates vary across states. In further analyses, some studies find that these returns attenuate over time after the completion of a certificate. Finally, different types of certificates have different returns. Most certificates are for vocational programs, and although these tend to have higher returns, the earnings gains for them are sensitive to fluctuations across industries and occupations.

Gains From Incremental College

Many community college students do not obtain an award, so it is important to look at whether these students benefit from college. Several CAPSEE studies examine the returns to credits and find a positive linear association—more credits lead to higher earnings, even for students who do not complete an award. This suggests a positive, incremental value to attending community college: both higher credit-bearing awards (i.e., degrees over certificates) and more accumulated credits lead to higher earnings.

Robustness of Earnings Gains

In further investigations, we have examined the sensitivity of these results in a number of ways (Belfield & Bailey, 2017b). The results are robust to alternative subsamples, including older students, those with limited pre-college earnings, those who experience a sharp drop in earnings before enrollment in college, and those with weak attachment to the labor market. Gains are higher when alternative assumptions are applied about missing earnings and when the post-college time horizon is extended.

The results are broadly robust to fixed effects model specifications. One assumption that is influential is how time trends

in earnings are modeled. Immediately after exiting college, award holders' earnings dip slightly as they seek a job that is a good fit for their skills; but subsequently, award holders experience faster earnings growth. How these time trends are modeled can make a difference in the estimated dollar gains.

Exploring Earnings Gains in More Detail

Heterogeneity of Results

Most of the studies under review here find that earnings gains vary by field of study. Specifically, earnings gains are significantly higher for associate degrees and certificates in health-related fields (e.g., nursing, health, and allied health). Earnings gains are also moderately higher across vocational fields of study. Indeed in some cases, persons with community college awards in arts and humanities fields have earnings that are indistinguishable from those of non-completers.

Features of the Returns to College

These statewide studies also reveal some new patterns of education and labor market outcomes among sub-baccalaureate college goers. First, award holders accumulate significant numbers of excess credits during college. Even though only 60 credits are typically required for an associate degree, in most of the states the completers earn, on average, 10 extra credits. Thus, the costs of completion are probably higher than expected. And non-completers—who average 20 credits before they drop out—are probably a lot further from completion than they might anticipate.

Second, many students work intensively while in college. The UI data identify the lost earnings while in college. Although students are earning less while in college, they are still working. This in-college work makes it harder to identify the returns to college. On the one hand, some of the earnings gains from college may actually be returns to work experience while in college. On the other hand, income earned in college reduces the opportunity cost of attending college.

Third, many students experience a significant drop in earnings right before they enter college. This drop might be voluntary—reducing work hours in order to focus on college studies—but it might be involuntary. Losing a job, for example, incentivizes the worker to go back to college. Notably, the drop in earnings is much greater for students who ultimately complete their degrees; this suggests that students may struggle to complete an award if they are combining college courses with full-time work.

Finally, earnings growth is quite rapid after exiting college. This growth is clearest in analysis for Virginia (Jaggars & Xu, 2016). Before college, earnings are growing at $70–$80 per quarter for all students. During college, earnings are growing more slowly, at $40–$60 per quarter. But after exiting college, the earnings of non-completers are growing at $100 per quarter, and the earnings of certificate holders and associate degree holders are growing at $180 and $240 per quarter, respectively.

Concerns About The Consensus of Findings

The findings reviewed here indicate clearly positive returns to associate degrees, modest and less consistent returns to certificates, and evidence of positive returns to credit completion without an award. Thus we find a consensus of positive returns to increments of college leading to degrees. Yet there are several potential concerns about this consensus of generally positive returns to sub-baccalaureate college.

One concern is that perhaps the average returns reported here do not apply to marginal students who are uncertain about going to college or completing their programs. These marginal students may have lower interest in college or less preparation or aptitude for college-level study, or they may have higher opportunity costs; therefore, their expected returns might be lower. However, most of the studies adjust for differences in ability and initial performance in college. In sensitivity testing, we find that the gains are robust to alternative samples of students.

Another concern is the impact of the Great Recession from December 2007 to June 2009—the "deepest downturn in the postwar era" which featured sharp declines in labor force participation, employment, and hours of work (U.S.

Bureau of Labor Statistics, 2012). Perhaps this event changed how the labor market rewards skills. The studies reviewed here include labor market activity spanning the period from 2000 to 2014 and find no evidence of a break in returns before and after the Great Recession.

Finally, there is the possibility of impact from adverse macroeconomic trends and a decline in "skill-biased technological change." Recent studies note a sharp fall in capital investment in the United States since 2000 and a concomitant fall in the need for higher level cognitive skills (see Beaudry, Green, & Sand, 2016). As the need for higher level skills diminishes, the returns to college might be expected to fall as well. Yet these changes have not fully developed. The linkages among education, workers' skills, job tasks and occupations, and earnings are complex. Workers have a range of skills that they can apply as the returns to each task change; firms can change the allocation of tasks or task composition of jobs in response to workers' skills. Accurate identification of changes in the returns to skills is therefore challenging; some studies find that, even as the skills needed at work are changing, the returns to education are still rising (see Castex & Dechter, 2014).

Overall, these concerns are unlikely to overturn the general findings on the returns to college.

Conclusion: Implications for Policy

Evidence from CAPSEE studies and related research suggests a consensus: the returns to sub-baccalaureate college are positive, and they are demonstrably incremental to the amount of college experience. In light of perpetual worries about the cost of college, this is optimistic news and should motivate students, families, and taxpayers to invest in college.

For associate degrees, the returns are robust across method, dataset, and time period. For certificates, the evidence is less compelling. Although certificates take less time to complete than associate degrees, it is unlikely that the recent growth in certificate completion can generate the same economic benefit as degree completion. An education policy that relies heavily on increased certificate completion is unlikely to be sufficient.

There is some heterogeneity in returns, which is clearly evident for occupational awards versus other awards and for programs in health fields compared with other fields. Helping each student to choose an appropriate program is therefore an important policy lever in maximizing the benefits of college.

Significantly, earnings gains from college appear to be responsive to broader macroeconomic trends in the form of labor market polarization, the Great Recession, and skills downgrading. Policymakers should appreciate how colleges can be particularly helpful to workers during tough economic times.

As the consensus indicates that further investments in sub-baccalaureate college are valuable for students, an important issue is why completion rates at two-year colleges are so low. A key policy issue is identifying the constraints that hinder students' completion of college programs and thus their ability to secure higher paying jobs.

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