

All or Nothing? Economic Returns to College Credits and Degrees

Topic

We assess wage returns to postsecondary credits and degrees for a national sample of young adults enrolling in college beginning in the late 1990s, distinguishing returns to college credits from returns to college degrees. The distinction has both theoretical and practical importance. Theoretically, the human capital perspective anticipates proportionate returns to credits such that 120 semester credits yields approximately the same economic benefit as a baccalaureate degree. Signaling, on the other hand, anticipates more modest returns to credits and a greater return to credentials. Practically, the results of this work will help us understand whether, in an age of rising costs and student debt, college attendance without completion is a worthwhile investment. With over four out of ten students who attend four-year colleges failing to earn a degree, and with even lower degree attainment rates for students in two-year colleges (NCES 2013, 2014), the per-credit returns to postsecondary experience are an important determinant of the life chances of a growing number of American youth.

Theoretical Focus

‘A college education’—popularly equated with a four-year degree or higher—is increasingly viewed as a necessary ticket to a middle class lifestyle. However, while the proportion of U.S. adults with at least a BA has more than doubled since 1970 (U.S. Census Bureau 2014), the majority of adults pursuing postsecondary education do not reach this milestone, as degree completion rates have declined at two-year and four-year institutions (Bound, Lovenheim, and Turner 2009; Carnevale and Strohl 2010; Grubb 1989). Correspondingly, the proportion of adults with more than a high school diploma but less than a BA has risen notably, accounting for nearly 30% of today’s labor force (Ryan and Siebens 2012).

In response to the horizontal stratification of the postsecondary sector (Gerber and Cheung 2008) and the growing proportion of adults whose highest education can be characterized as ‘sub-baccalaureate’, studies of education returns also have diversified to consider outcomes for a broader range of educational pathways. Estimates based on various datasets and spanning multiple decades point to earnings gains for a two-year AA degree ranging from 15-30% above a high school degree, with higher returns typically found for women (Grubb 1997; Kane and Rouse 1995; Leigh and Gill 1997; Marcotte et al. 2005). Evidence is more mixed regarding returns to credits without degree attainment. However, two prominent studies using national survey data estimate that a year of credits attained at two-year or four-year institutions increases earnings by 5-10% (Kane and Rouse 1995; Marcotte 2010).

The distinction between returns to credits versus degrees lies at the heart of a debate between human capital theories (e.g. Becker 1964) and signaling theories (Arrow 1973; Spence 1973) concerning the role of education in labor market outcomes. Put simply, human capital theory posits that education pays because students acquire valuable skills in school that improve their workplace productivity, while signaling theory posits that credentials provide a signal to employers of a workers’ ability regardless of whether schools contribute to skills or not. Human capital theory therefore anticipates incremental returns to each additional course or unit of schooling, while signaling theory anticipates negligible to modest returns to educational experience but appreciable returns to credentials.

While past research suggests positive returns for additional postsecondary credits, the most recent national assessment of labor market returns to postsecondary credits and degrees is for 2000 labor market outcomes (Marcotte 2010). Have the returns to postsecondary education, and particularly to sub-baccalaureate education, held steady in the more recent period? Over the past several decades, postsecondary enrollments in the United States have increased alongside rising returns to education. The steady rise in education returns despite increasing postsecondary enrollments has been attributed to technological change and a demand for skilled workers that has outpaced their supply (Autor 2014; Goldin and Katz 2008). While most trend analyses of returns to college education have focused on BA returns, recent analyses of “middle-skill occupations” (i.e., those requiring an AA or other shorter-term postsecondary credentials) similarly report growing shortages of skilled workers, especially in certain sectors like healthcare and electronics (Carnevale, Smith, and Strohl 2010; Holzer and Lerman 2007). On

the one hand, if the demand for skilled workers has continued to grow faster than their supply, then the human capital perspective would predict a continued rise in per credit returns to education. On the other hand, if rising returns to a college education are largely due to the signaling effects of degrees as opposed to the skills actually learned in school, then returns to degrees may have risen alongside flat or even declining returns to credits independent of degrees.

Methods and Data

We estimate 2010 wages for young adult workers who have accrued credits and credentials in two-year and four-year institutions, relative to individuals with a high school degree only. Consistent with previous studies, we estimate a human capital earnings function (Mincer 1974) in which labor market outcomes are regressed on completed education, work experience, and a host of controls. Also consistent with previous studies, we restrict the analytic sample to individuals who have positive 2010 earnings, are not enrolled in college in the outcome year, and have not earned a graduate degree. We estimate separate models for men and women.

The basic model is:

$$\ln w_i = \alpha + \text{DEGREE}_i \beta + \text{CRED2YR}_i \gamma_1 + \text{CRED4YR}_i \gamma_2 + \text{EXPER}_i \lambda_1 + \text{EXPER}_i^2 \lambda_2 + X_i \delta + \text{BACKGROUND}_i \theta + \text{ASVAB}_i \pi + \varepsilon_i$$

Outcome $\ln w_i$ is a measure of log hourly wages averaged across all jobs held in 2010. **DEGREE_i** is a vector of dummy variables representing highest postsecondary credential attained. **CRED2YR_i** and **CRED4YR_i** are measures of FTE years of credits earned in two-year and four-year schools, respectively, *for those not attaining a degree* (credits for individuals earning postsecondary degrees are set to zero). Thus, β reflects labor market benefits accruing to both credits and credential completion, whereas γ_1 and γ_2 reflect credit effects for non-degree-completers.

Linear and quadratic terms for experience (**EXPER_i**, **EXPER_i²**) are based on annual self-reported measures of total weeks worked summed to 2010. X_i is a vector of standard controls, including age, race/ethnicity, nativity, and U.S. region. Family background, **BACKGROUND_i**, includes parents' education and parents' income at baseline. Age-adjusted scores on the Armed Services Vocational Aptitude Battery test (CAT-ASVAB), also administered at baseline, serve as a measure of cognitive ability (**ASVAB_i**).

We use panel data from the National Longitudinal Survey of Youth 1997 (NLSY97), a nationally representative sample of 8,984 U.S. youth born between 1980 and 1984. The survey was first conducted in 1997, when youth were 12-17 years old, and has been fielded annually through 2011-2012, when survey respondents were 26-31 years old. The outcomes assessed in this study thus represent wages in the early careers of individuals pursuing a variety of education paths. The NLSY97 provides detailed data on the postsecondary enrollment of youth in the late 1990s and into the first decade of the 2000s, a period of increasing college enrollment (Fry 2009). In addition to rich survey data, transcripts for more than three-quarters of 4,113 respondents who claimed any postsecondary enrollment provide detailed information on credits accumulated and degrees earned in both two-year and four-year institutions.

Findings

Preliminary results for returns to postsecondary degrees are consistent with other empirical research: postsecondary credentials confer significant labor market benefits in the current era, with especially strong returns for women (DiPrete and Buchmann 2005; 2013). As shown in Table 1, whereas women with a high school diploma only earned \$12.38/hour on average in 2010, women with an AA earned \$16.86/hour (a 36% increase compared to the high school group) and those with a BA earned \$19.28/hour (a 56% increase compared to the high school group). Comparable figures for men are \$16.34/hour for high school diploma holders versus \$20.00/hour for AA holders (a 22% increase) and \$21.64/hour for BA holders (a 32% increase).

Table 3 presents coefficient estimates from regressions of log hourly wages on postsecondary education, controlling for cumulative work experience, ability, family background, and demographic characteristics. Even with extensive controls, women and men with an AA earn about 16% and 13%

more, respectively, than those with only a high school diploma. A BA confers large benefits for women, who earn 42% more than high school diploma holders; male BA holders earn 17% more than the high school diploma group, a similar premium as that accruing to male AA holders. With the exception of male BA holders, for whom BA returns are not as high, these estimates are strikingly similar to Marcotte's (2010) most recent national analysis of returns to AA and BA degrees in 2000.

Although a large proportion of students who enroll in postsecondary institutions never earn an AA or a BA, many of these 'non-completers' accumulate a substantial number of postsecondary credits. As shown in Table 2, more than 40% of both men and women who enroll in two-year colleges earn more than a FTE semester of two-year credits, while nearly two-thirds of four-year enrollees earn more than a semester of four-year credits. The average hourly wages reported for the "some college, no degree" category in Table 1 suggest that they lie between the average wages for the high school and AA groups, for both men and women.

The regression results, however, tell a different story. Consistent with previous studies (Marcotte 2010; Kane and Rouse 1995), women with a high school diploma as their highest degree earn a wage premium of approximately 5-7% per FTE year of two-year or four-year credits. For men, however, earning some credits and no degree does not appear to confer the same benefits, and returns to two-year credits for men are actually negative (though not significant). This is inconsistent with the bulk of prior research, which on the whole has suggested that men without degrees *do* derive labor market benefits from attaining some college, even if the benefits are lower than those accruing to women.

Viewed from a human capital perspective, these preliminary results suggest that women who accrue credits but no degree acquire skills that are rewarded in the current labor market, whereas men who earn credits but no degree are either (a) not acquiring these skills, (b) acquiring skills that are qualitatively different, and/or (c) engaged in labor markets that do not reward these skills. In analyses currently under way, we hope that transcript-level information on GPA and program type (e.g., vocational versus academic) can help shed light on possibilities (a) and (b). Future analyses will also pursue alternate methods to correct for selection into different education and employment paths.

Significance

This study contributes to our understanding of labor market returns to education for a sample of young adults enrolling in college in the late 1990s and into the first decade of the 2000s, addressing the question: What is the payoff to postsecondary credits and degrees in a college-for-all era? The answer to this question has implications for the recent generation of youth and young adults who have selected into these pathways, and for the advice we give to the current generation of students considering various postsecondary options alongside their respective costs.

This paper is a departure from most national studies of returns to postsecondary education in its focus on returns to credits for non-degree earners in addition to returns to degrees. While results are preliminary, they suggest that the human capital acquired in college classrooms is either different, or paying off differently, for men and women in the post-recession period.

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Table 1: 2010 Average Hourly Wages, by Gender and Educational Attainment

	<u>All</u>	<u>Women</u>	<u>Men</u>
< High School	12.25	10.06	13.47
GED	13.92	11.81	15.14
High school diploma	14.73	12.38	16.34
Some college, no degree	16.09	14.24	17.53
AA	18.42	16.86	20.00
BA	20.39	19.28	21.64
Grad	27.60	27.75	27.36
Total	17.12	16.10	17.97
N	4,765	2,224	2,541

Source: NLSY97

Calculations restricted to individuals participating in Round 15 and not enrolled in college in 2010.

Wage calculations restricted to individuals with non-zero 2010 average wages.

All calculations use NLSY97 Round 15 panel weights.

Table 2: Degree Attainment and Credits Earned by Postsecondary Enrollees

	<u>Women</u>	<u>Men</u>
<u>% enrolling in 2yr</u>	0.35	0.30
Proportion earning AA	0.21	0.17
For those not earning a degree:		
Average FTE years of credits earned	0.66	0.64
Proportion earning >1 semester of credits	0.43	0.44
<u>% enrolling in 4yr</u>	0.40	0.33
Proportion earning BA	0.66	0.60
For those not earning a degree:		
Average FTE years of credits earned	1.40	1.30
Proportion earning >1 semester of credits	0.66	0.63

Source: NLSY97

All calculations are weighted by NLSY97 Round 15 panel weights and restricted to individuals participating in Round 15, not enrolled in college in 2010, and possessing a bachelor's degree or lower.

Credit calculations are based on a subsample of postsecondary enrollees for whom all transcripts from all self-reported postsecondary institutions could be located.

Table 3: Regression of Log Hourly Wages on Postsecondary Credits and Degrees, by Gender

	Women	Men
AA (highest degree)	0.157* (0.0718)	0.131* (0.0595)
BA (highest degree)	0.353*** (0.0450)	0.157*** (0.0450)
FTE Years of 2yr credits	0.0549+ (0.0323)	-0.0340 (0.0303)
FTE Years of 4yr credits	0.0697* (0.0282)	0.0335 (0.0211)
Observations	1051	1377
R-squared	0.277	0.187

Standard errors in parentheses

+ $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

Models control for experience, experience-squared, race/ethnicity, immigrant status, region of residence in 2010, rural/urban residence at baseline, HS dropout, GED receipt, AFQT quartile, parents' highest grade, and parents' income.

All regressions are weighted by NLSY97 Round 15 panel weights.