State of Washington

Postsecondary Education Assessment in Washington State:

Earnings Premium Estimates for Associate Degrees

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ABSTRACT

This paper examines the earnings of workers with associate degrees from Washington state public colleges and universities compared with the earnings of workers with public high school diplomas only. We use propensity score matching to control for selection bias. Our analysis is based on data contained in the Washington State Education and Research Data Center's P-20W data warehouse. This study examines the hypothesis that an associate degree and its attendant human capital provide increased earnings for degree earners. We find positive earnings impacts for males, but only modest earnings benefits for females from an associate degree.
JEL Classification: C23, H40, I21, J17, J24, J31

Keywords: propensity score matching, returns to community college, returns to education, associate degree, college earnings premiums selection-corrected earnings premium

Contents

1. Introduction

There are approximately 60,000 public high school diplomas earned in Washington state each year. This study starts with 184,118 high school graduates from 2005, 2006 and 2007. Of these high school graduates, 53,938 enrolled in a four-year institution, leaving 130,180 as candidates for this study. Of the study candidates, 8,602 earned an associate degree by 2012 and had no additional postsecondary credential such as a bachelor's degree. These "terminal" associate degree earners are the subject of this study. This paper estimates selection-corrected earnings premiums of workers with terminal associate degrees compared to high school graduates with no postsecondary experience.

This paper is the second in a series that provides information on the economic returns to postsecondary education in Washington. It specifically examines the net earnings impacts of attaining a terminal associate degree from a public community college in Washington. The terminal associate degree earners are compared to students who complete only their high school diploma from a Washington public high school, but do not participate in any postsecondary education. This paper follows the analysis from the Paterson and Weeks (2014) paper on selection corrected earnings premium for bachelor's degrees from Washington state public universities (denoted PW). The present study follows a similar methodological approach as PW. We use education and workforce data from the Washington State Education Research and Data Center (ERDC) P-20W data warehouse. This research was funded by the Washington State U.S. Department of Labor Workforce Data Quality Improvement (WDQI) grant, and demonstrates the value of connecting education and workforce information.

As in PW, this analysis is challenging due to the presence of selection bias. Both the decision to attend community college and earnings are determined by many of the same factors. These factors include academic ability, persistence, future orientation, community characteristics, parents' income and education, and the student's propensity to attend postsecondary education. This selection bias is often unrecognized in studies of postsecondary educational outcomes (PW, Schneider, 2013).

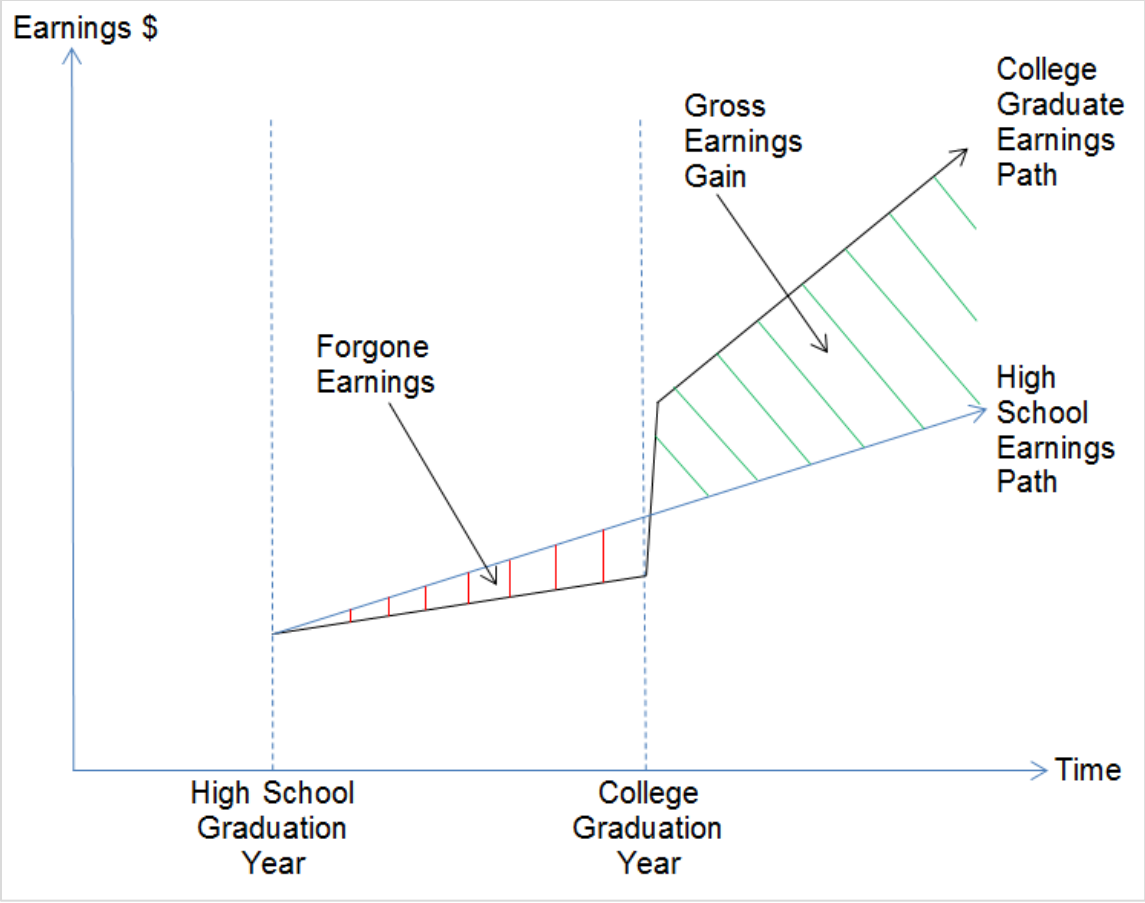
This study exploits the rich ERDC data, which provide an unprecedented level of detailed information about students. These data permit a propensity score matching (PSM) approach to correct selection bias. PSM matches treatment group members to individual comparison group members based on the propensity score (the probability of attaining an associate degree). The propensity score reduces the dimensionality of matching on multiple variables by acting as a single number index of the variables that are used in its estimation. After matching individual comparison group members to treatment group members, the resulting matched groups can be analyzed as if they were experimentally derived. "This formulation is that used in the literature of experimental design" (Rosenbaum and Rubin, 1983, p. 41).

This is an observational study, using administrative data from the ERDC P-20W data warehouse. The core hypothesis of this study is the counterfactual statement: "The earnings of workers with terminal associate degrees exceed the earnings they would have achieved if they had no postsecondary education."

While it is not possible to know that selection bias has been eliminated from any observational study, the PSM technique represents the best available corrective method. "Approaches that directly match participants with nonparticipants who have similar characteristics have replaced regression as one of the preferred methods for estimating intervention impacts using comparison group data" (Heinrich, Maffioli and Vezquez, 2012, p. 4).

Figure 1 shows the hypothesized earnings trajectories for the two study groups. The associate degree earners are expected to earn less than the matched high school-only group while attending community college. These forgone earnings represent the opportunity cost of earning an associate degree (or any postsecondary education). After completion of the associate degree, earnings should increase substantially, reflecting the increased human capital, productivity and earnings potential of the community college degree.

Figure 1. Hypothesized earnings trajectories



This paper is organized as follows. Section 2 describes prior work assessing the earnings gains of an associate degree. Section 3 discusses the paper's analytical approach, including our use of propensity score estimation and a matching selection algorithm. Section 4 describes the data we use for the analytics in this paper. Section 5 describes our net assessment estimation methodologies. Section 6 discusses our net impact findings. We conclude the paper with conclusions and observations from the research in section 7.

2. Previous Research

While there is a substantial body of research on the economic benefits of educational attainment, "research on the labor market advantages of community college attendance per se is extremely limited" (Belfield and Bailey, 2011, p. 47). Belfield and Bailey provide the most comprehensive and up-to-date review of the literature on the economic returns to community college. They summarize 21 individual studies and compare their methodology and results. Belfield and Bailey conclude that "there is strong evidence that associate degrees and years of community college education yield extra earnings compared to high school graduation" (Belfield and Bailey, 2011, p. 49). The average of the study results they review is a 13 percent earnings gain for males and a 22 percent earnings gain for females from an associate degree.

Unfortunately, "[t]his literature is plagued by the problem of selection bias, wherein high ability and highly motivated students may be more likely than others to have both higher college attainment and higher earnings" (Dadger and Weiss, 2012, p. 3). Only two of the studies reviewed by Belfield and Bailey include corrective adjustments for selection bias (Jepsen, et. al. 2014 and Jacobson, et. al. 2005). Both studies use fixed effects models to standardize for time invariant student characteristics within the context of Mincerian earnings equations. Dadger and Weiss (2012) also estimate the returns to a range of postsecondary degrees, including associate degrees, by applying a fixed effects model for Washington state students. Jebsen, *et. al.* (2014) use Kentucky administrative data. Dadger and Weiss (2012) observe that both of these studies use a "comparison group consist[ing] of students who earn some community college credits but leave without ever earning a credential; therefore our results can be directly compared to the estimates provided in that (Jebsen, et al., 2014) paper, but are not directly comparable with the results from the cross-sectional literature that uses students with a high school diploma as the comparison group" (Dadger and Weiss, 2012, p. 6).

Other educational research studies directly compare average post-graduation earnings between groups with different levels of educational attainment. While these studies often claim to show an earnings premium for a specified education level (e.g., associate degree), they actually show a premium that is, in part, attributable to the differences in characteristics between graduates and non-graduates, and partly attributable to the attained education level. These studies commonly do not distinguish between these two aspects of the earnings premium, and thereby overstate the returns to educational attainment.

For example, a recent study examines the earnings premium of an associate degree based on "raw" (not selection-adjusted) earnings of graduates compared average earnings for associate degrees by major to a variety of other postsecondary degrees and certificates: "Higher Education Pays: But a Lot More for Some Graduates than for Others" (Schneider, 2013). The data upon which the paper is based reflect an impressive effort to use the education and earnings data from five states: Arkansas, Colorado, Tennessee, Texas and Virginia. These states provided detailed postsecondary educational attainment matched to earnings information for the first year post-graduation. The focus of the paper is to compare different levels of postsecondary educational attainment and further disaggregate degrees and certificates by type. For example, associate degrees are divided into technical and academic degrees, where possible. The paper does not compare postsecondary certificate and degree earners with workers who did not attend postsecondary education. It also makes no adjustment for selection bias, though it seems likely

that there is selection bias among students who attain a certificate, an associate degree and a bachelor's degree. There may also be selection bias between students who choose to pursue a more technical certificate or degree and a more academic credential.

A key finding from the paper is that the average earnings for some technical associate degree programs exceed the average earnings of more purely academic associate degree programs. Unfortunately, because the study ignores selection bias, this differential cannot be disaggregated into the portion due to student characteristics and the portion due to the intrinsic value of the credential. It leaves unexplored the extent to which the earnings differentials described in the paper are due to the intrinsic economic market value of the credentials rather than to systematic differences in the characteristics and backgrounds of the students.

A second study, using a similar approach, measures the annual median earnings by educational attainment (Baum, Kurose and Ma, 2013). The authors do not adjust for selection bias or any differences between groups with different levels of educational attainment. They provide earnings information for a broad range of educational outcomes, including the associate degree. They also offer information on a wide variety of outcomes, ranging from demographic characteristics to civic involvement. This range of topics demonstrates the broad reach of education to outcomes beyond earnings. They also likely overstate the earnings premium for postsecondary education throughout the analysis due to uncorrected selection bias. Additionally, their use of the median as a measure of central tendency is preferred to using the mean largely because earnings distributions are not normal. Using median earnings also moderates the impacts of extreme values.

The present study contributes to this literature by exploiting the rich data in the P-20W data warehouse to use the PSM approach to control for selection bias and compare the earnings of associate degree earners with closely matched high school only (no postsecondary experience) workers.

3. Analytical Approach

As in PW, we use the ERDC data to implement a PSM study design. Logistic regression is used to estimate propensity scores for the treatment and comparison groups, and each sample member is assigned a calculated propensity score. Females and males are estimated separately. "The propensity score is the conditional probability of assignment to a particular treatment given a vector of observed covariates" (Rosenbaum and Rubin, 1983, p. 41). We institute a one-to-many with replacement matching algorithm, where comparison group members are matched to one or more treatment group members. This technique minimizes the total (sum) distance between treatment and comparison propensity scores. We recognize that this technique increases the level of precision at the cost of a slight increase in bias (Dehejia and Wahba, 2007, p. 151, 153 and 158).

4. Data

Like PW, we start with the roster of graduates from public high schools in Washington state, extracted from the annual ERDC High School Feedback Reports (ERDC 2013). Washington public high school graduates from 2005, 2006 and 2007 are selected for the study. Those

students who graduated with an associate degree from a public community college in Washington and have no subsequent postsecondary degree make up the treatment group. Based on information from the ERDC and the National Student Clearinghouse (NSC), treatment group members who were attending an out-of-state college or university were eliminated from the study population. Also, any treatment group members who attained an additional postsecondary degree beyond the associate degree were removed from the study[1]. All comparison group members who attended *any* postsecondary education based on ERDC or NSC data were eliminated from the comparison group. Finally, because unemployment insurance (UI) earnings records are required for in-state employment follow-up, comparison and treatment group members without a Social Security number in their file were also eliminated from the study. Since the earnings records reflect only covered employment in Washington state, we have no means to differentiate non-participation in the labor market from either self-employment (uncovered) or out-of-state employment.

This report used data that are being loaded into the comprehensive longitudinal data warehouse under development by ERDC. This data warehouse is designed to collect and distribute unit record educational and workforce participation and attainment information for all Washington students from preschool through graduate or professional school and into the workforce (P-20W data warehouse). A more thorough description of the data used in this report can be found in Appendix A.

The sources for the data used in this study are administrative data files that are not collected for research purposes, and include limitations and shortcomings. There may be some institutions not covered in the data. For example, some private universities in Washington may not share data with the ERDC, or other postsecondary providers nationwide may not share data with the NSC. Also, some data elements may be missing or inaccurate, such as missing earnings in the UI earnings record data[2]. Fortunately, the data used in this study are generally accurate and complete. The data anomalies and errors just described make up a small proportion of the information being used, and have a very minimal impact on study findings.

5. Net Assessment Methodology

We assess the net impact on earnings of obtaining an associate degree by differencing the median annual real earnings of the treatment and comparison groups for the years before and after the completion of the degree. Most students did not progress straight from high school to a community college, and some earned a substantial number of college credits while still in high school; associate degrees were earned across all the years of the study. Table 1 shows the distribution of degrees by gender and year. About one-third of our sample graduated from high school in 2005, one-third in 2006 and one-third in 2007.

[1] Thus, the treatment group is right-hand censored with respect to subsequent postsecondary degrees, and some treatment group members may achieve additional postsecondary degrees subsequent to this study.

[2] Approximately 0.5 percent of all UI wage records considered for this study had missing data in at least one quarter of any of the analysis years. Missing wage data, either totally or in part, might indicate working out of state or self-employment. We have no way of distinguishing these statuses from not employed.

Table 1. Associate degree graduation by year and gender

Year	Male	Female	Total	Percentage	Cumulative percentage
2005	7	8	15	0.7	0.7
2006	9	20	29	1.6	2.3
2007	56	28	84	4.6	6.9
2008	66	53	119	6.5	13.4
2009	88	97	185	10.1	23.5
2010	107	147	254	13.9	37.3
2011	185	225	410	22.4	59.7
2012	148	228	376	20.5	80.2
2013	177	184	361	19.7	99.9
Total	843	990	1,833	100	100

Reorganizing this information by years since high school is shown in the following two charts for female and male students. For both genders, the median time to earning an associate degree from high school graduation is five years. Also, some students continue to earn associate degrees eight years after high school. The timing of earning associate degrees relative to high school is quite similar for males and females.

Table 2. Associate degrees earned by years since high school graduation, females

Years since high school graduation	Number	Percentage	Cumulative percentage
0	26	2.6	2.6
1	28	2.8	5.5
2	69	7.0	12.4
3	133	13.4	25.9
4	175	17.7	43.5
5	201	20.3	63.8
6	186	18.8	82.6
7	121	12.2	94.8
8	51	5.2	100.0
Totals	990	100.0	

Table 3. Associate degrees earned by years since high school graduation, males

Years since high school graduation	Number	Percentage	Cumulative percentage
0	23	2.7	2.7
1	18	2.1	4.9
2	95	11.3	16.1
3	109	12.9	29.1
4	144	17.1	46.1
5	136	16.1	62.3
6	160	19.0	81.3
7	101	12.0	93.2
8	57	6.8	100.0
Totals	843	100.0	

The data in the results section below are "stacked" by years before and after attainment of the associate degree. Negative numbers reflect years prior to the degree and positive numbers represent earnings for years after degree attainment. Thus, the horizontal axes in the charts run from -5 to +6. The stacking process is represented in Table 4.

Table 4. Stacked annual earnings year by year of associate degree attainment

Year of Graduation	Year -5	Year -3	Year -2	Year -1	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
2012	2008	2009	2010	2011	**2012**	2013					
2011	2007	2008	2009	2010	**2011**	2012	2013				
2010	2006	2007	2008	2009	**2010**	2011	2012	2013			
2009		2006	2007	2008	**2009**	2010	2011	2012	2013		
2008			2006	2007	**2008**	2009	2010	2011	2012	2013	
2007				2006	**2007**	2008	2009	2010	2011	2012	2013

In Table 4, six cohorts are represented for illustrative purposes. We assume all six cohorts graduated from high school in 2005 (earnings start in 2006) and earned their associate degree in the year shown in the "zero" column (bolded). Earnings data are available through 2013, so that is the last year in each row. The actual data include earnings data by calendar year for male and female associate degree earners and their comparison group counterparts.

Looking at Table 4, column Year 1, annual median earnings for associate degree graduates one year after attaining the degree is calculated by stacking all the earnings for cohorts one through six from the respective years in the Year 1 column and calculating the median of these earnings. This same sequence is followed for any year before or after graduation.

6. Findings

The primary results of this research are presented below in chart form. Earnings are organized by year, with Year Zero indicating the year the associate degree was attained. Negative numbered years refer to years prior to earning a degree and positive numbered years refer to years after the attainment of the associate degree. The comparison group is similarly organized, with Year Zero referencing the year the matched treatment group member earned the associate degree.

Figure 2 shows the median pre-degree and post-degree annual real (2013 dollars) earnings for female treatment and comparison group members. The pre-degree period is marked by higher comparison group earnings, particularly as the graduation year nears. This reflects the forgone earnings associated with college attendance. After graduation, the treatment group begins to gain on the comparison group in terms of earnings. By the second year after the degree, treatment group earnings equal comparison group earnings. Also, after degree attainment (Year Zero), the slope of the linear trend line for treatment group earnings is increasing faster than that of the comparison group, even if the treatment group members do not out-earn the comparison group every year.

Figure 2. Female earnings: associate degree (T) compared to high school only (C), years since degree, 2013 dollars

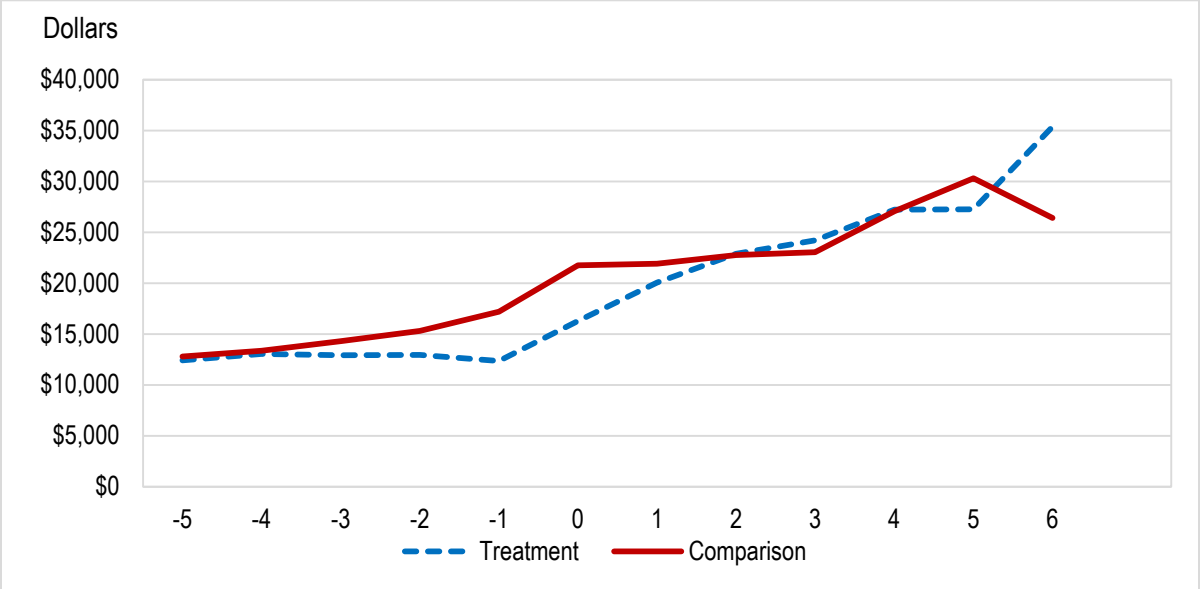


Figure 3 shows the median pre-degree and post-degree real annual earnings for male treatment and comparison group members. As with the females, the earnings data for males show a clear pattern of pre-degree opportunity costs as the comparison group out-earns the treatment group over years - 4 to +1. However, by the second year after the attainment of the associate degree, the male treatment group members experience consistent earnings growth, out-earning the comparison group members by increasing amounts each year after earning an associate degree. Median annual earnings for males exceed $54,000 six years after attaining an associate degree.

Figure 3. Male earnings: associate degree (T) compared to high school only (C), years since degree, 2013 dollars

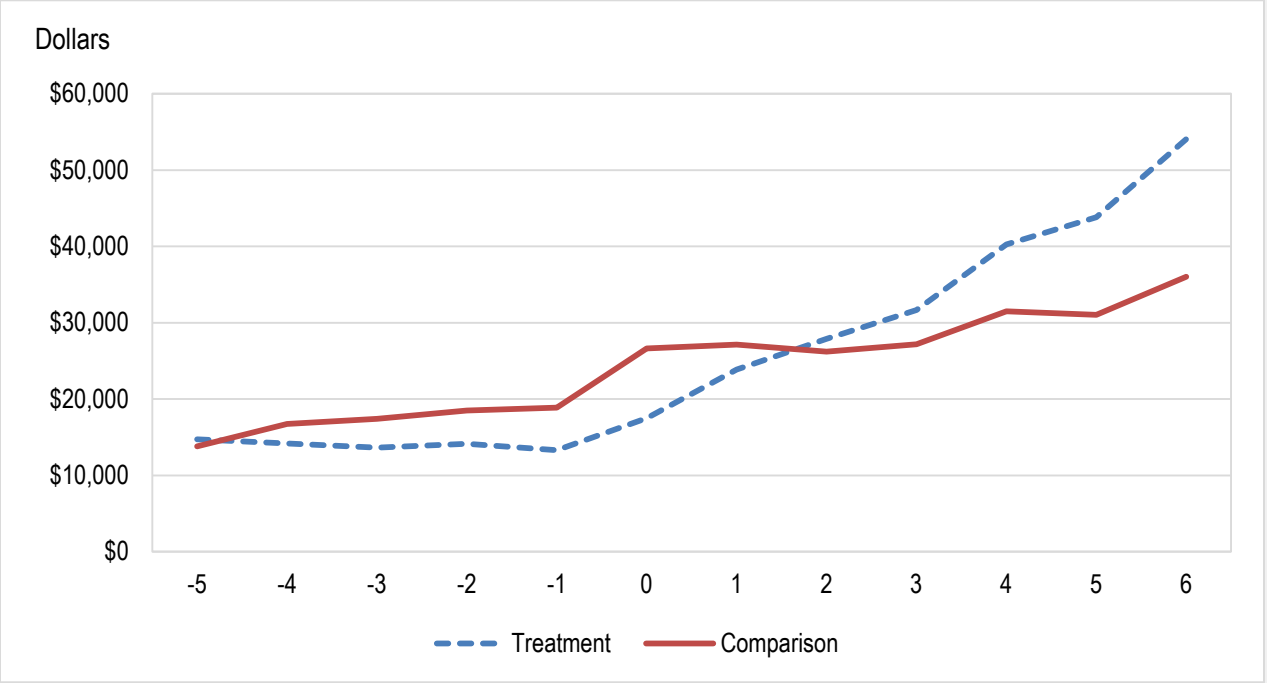


Figure 4 shows both female and male median pre-degree and post-associate degree real annual earnings on the same chart. This display permits a direct comparison of earnings by gender. For both the comparison and treatment groups, male earnings consistently exceed female earnings, both prior to and after the attainment of the associate degree. The trajectories of the male and female comparison group earnings over time generally parallel one another through Year Four. Also, the median annual earnings of the female treatment group equal the median annual earnings of the male comparison group by Year Five.

Figure 4. Female and male earnings: associate degree (T) compared to high school only (C), years since degree, 2013 dollars

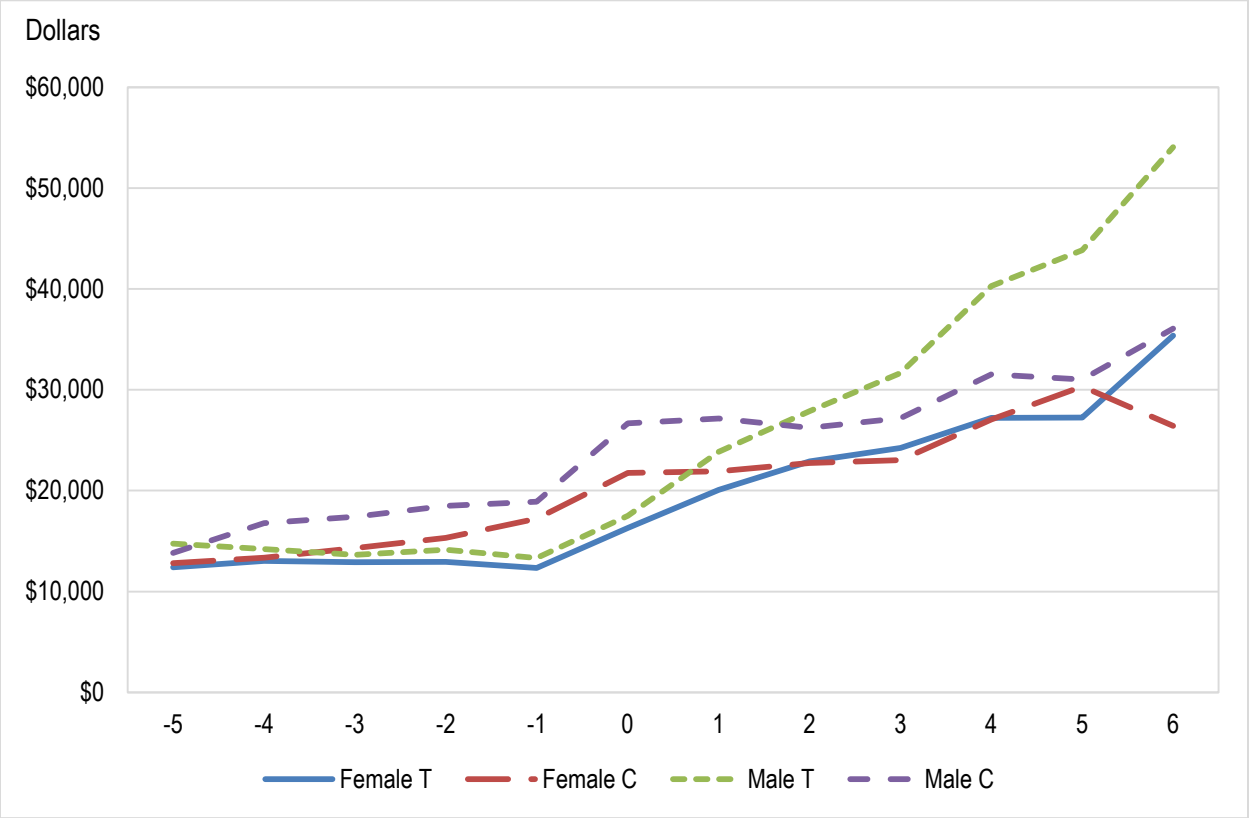


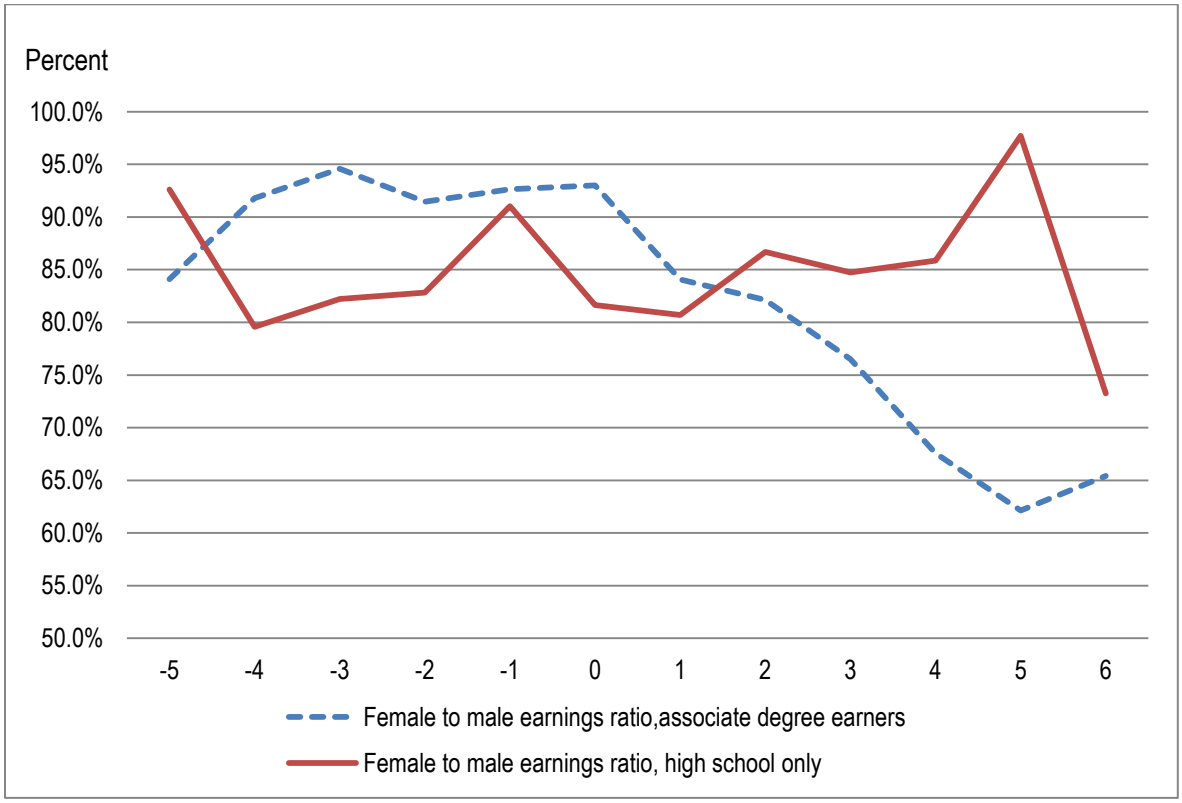
Figure 5 summarizes the earnings premium of attaining an associate degree compared to high school only for females and males. The earnings premium shown in this chart is simply the arithmetic difference between the median annual real earnings of the associate degree earners (Treatment) and the high school-only workers (Comparison). While the earnings premium for males shows an opportunity cost dip below zero for a few years prior to attainment of the associate degree, starting with the first year after the degree, the earnings premium turns positive. Perhaps the most dramatic feature of the chart is the consistent increase in the earnings premium for males after attainment of an associate degree. By the sixth year after attainment of an associate degree, males experience earnings gains of nearly $20,000 over high school-only workers.

The earnings premium results for females are more ambiguous. While females also experience an opportunity cost earnings premium dip below zero prior to attaining an associate degree, the earnings premium after attainment of an associate degree only comes up to zero, then does not rise substantially until Year Six. More years of follow-up are required to learn whether this increase is sustained over time, but it is nonetheless far below the male earnings premium.

Figure 5. Female and male earnings premiums: associate degree compared to high school only, years since degree, 2013 dollars

Figure 6 shows the female-to-male earnings ratio for the treatment (associate degree) and matched comparison (high school only) groups. A value of 100 percent indicates both genders have the same level of earnings and a value of 50 percent indicates female workers have half the earnings of male workers. As shown in the chart, the female-to-male earnings ratio fluctuates around 80 percent, particularly for the high-school only workers. The female-to-male earnings ratio for associate degree earners declines after attainment of the degree to about 60 percent by Years Five and Six. This effect is largely due to the earnings gains of male workers.

Figure 6. Female to male earnings ratio: associate degree and high school only, years since high school, 2013 dollars



7. Conclusion

This paper analyzed the selection-corrected economic returns to earning an associate degree in public community colleges in Washington state and not continuing to an additional postsecondary degree. Males showed a strong and consistent earnings gain after completing an associate degree relative to their matched comparison group members (Figure 3). Females exhibit a much more tentative earnings gain, just offsetting the pre-degree opportunity cost until Year Six, when earnings for associate degree earners increased substantially over the high school-only comparison group.

Figure 5 directly compares the male and female earnings premium associated with a terminal associate degree over a high school graduate with no postsecondary experience. The male earnings premium increases by an average of $4,400 per year, from -$8,500 at the time of the degree (reflecting the opportunity cost of college attendance) to $18,000 by the sixth year after the associate degree is earned. For females, the earnings premium is -$5,500 at the time of the degree (reflecting the opportunity cost of college attendance), and fluctuates around zero until Year Six, when it rises to $9,000.

Consequently, the female-to-male earnings ratio (Figure 6) for the comparison group fluctuates between 80 percent and 85 percent through Year Five. In Year Five, this ratio increases to 97 percent, but then declines to 73 percent. The large swings during the later years of the study may reflect variability associated with smaller sample sizes. For the treatment group, the female-to-

male earnings ratio shows a consistent decline from 81 percent at the time of earning the associate degree to 65 percent by Year Six. This decline is attributable to the significant and consistent growth of male earnings and the relative stagnation in female earnings.

As in PW, we find female workers consistently earn less than their male colleagues at all levels of educational attainment analyzed to date. In both PW and this analysis, female-to-male earnings ratios decline in the post-degree years for the treatment groups while remaining relatively constant for the comparison groups.

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Appendix

Appendix A: Enrollment Data Sources and Definitions[3]

Enrollment data for this study came from the following sources:

High school graduates: The annual summary data file (P-210) for high school enrollment and completion from the Office of Superintendent of Public Instruction (OSPI). This file identifies regular high school graduates, their graduation date, school district and school, low-income status, gender, grade point average and race/ethnicity. The P-210 record for a student is referred to as the student's "graduation record" in the discussion that follows.

Washington community and technical college enrollment: Enrollment data from the State Board for Community and Technical Colleges (SBCTC), which include student enrollment status, by term, for the 34 colleges in the state system. Students enrolled in basic skills courses only (adult basic education, English as a second language, GED preparation classes) are not treated as postsecondary enrollment for this study. Community and technical college enrollment includes students preparing for both certificates and degrees leading to careers as well as students preparing for transfer to academic programs in four-year institutions.

Washington public four-year higher education enrollment: Enrollment data for the state's six public baccalaureate higher education institutions from the Public Centralized Higher Education Enrollment System maintained by the Office of Financial Management.

Enrollment data for private and out-of-state higher education institutions: Enrollment data for institutions other than the Washington public institutions were obtained from the National Student Clearinghouse, which captures 92 percent of postsecondary enrollment nationally. At this time, it is the best source of information about postsecondary enrollment in private higher education institutions in Washington and for all out-of-state institutions.

Administrative data from state's unemployment insurance program: Provided by the Employment Security Department. This data source is described in the main body of the report.

[3] ERDC Research Brief 2011-02. (2011) Workforce Participation: Washington High School Graduates, 2008-09. Appendix A, pp A1. Retrieved from: http://www.erdc.wa.gov/briefs/pdf/201102.pdf.

Appendix B: Unemployment Insurance[4]

The unemployment insurance (UI) program is a federal-state program financed by payroll taxes paid by employers. The U.S. Department of Labor sets broad criteria for the eligibility and coverage, but states determine the specifics of implementation. In Washington, the Employment Security Department is responsible for the administration of the UI program.

Employers must participate in the UI program if they pay earnings to employees, regardless of the dollar amount. Participating employers are called "covered employers." Participation includes registering, reporting earnings and paying unemployment taxes or reimbursing the department for benefits paid for all part-time or full-time employees. There are exceptions to this, including the following:

- Small farm operators — those with payroll less than $20,000 and fewer than 10 employees — do not cover spouse, children under 18 or student workers.
- Employees performing domestic services in a private home, college club, fraternity or sorority are not covered if the total earnings paid are less than $1,000 per quarter. If payroll exceeds $1,000 in any quarter, earnings must be reported for the entire year and the following year.
- Nonprofit preschool staff if fewer than four staff.
- Business owners are not reported. Sole proprietors do not report their spouses or unmarried children under 18.
- Corporate officers are required to cover themselves for UI unless they opt out by Jan. 15 each year.
- There are additional types of employees who an employer may not be required to report, depending upon the circumstances. Those most pertinent to this study are the following:
  - » Self-employed workers
  - » Church employees
  - » Work-Study students, as long as the employer is a nonprofit 501(c)(3), state government or local government

More information about the UI program in Washington is available from the Employment Security Department[5].

In addition to the above categories, federal civilian employees and both active duty and retired military are not reported in the state-level UI program administrative records.

Nationally, the UI program includes 98 percent of all employers.[6]

[4] ERDC Research Brief 2011-02. (2011) Workforce Participation: Washington High School Graduates, 2009-09. Appendix B, pp B1-2. Retrieved from: http://www.erdc.wa.gov/briefs/pdf/201102.pdf.

[5] "Unemployment Insurance Tax Information: A handbook for Washington state employers," January 2011, Employment Security Department. http://www.esd.wa.gov/uitax/formsandpubs/tax-handbook.pdf.

[6] ERDC Research Brief 2011-02 April 2011 B-2 "Technical Notes to Establishment Survey Data Published in Employment and Earnings, U.S. Department of Labor, Bureau of Labor Statistics.

Data Elements and Timing

In Washington state, employers file a quarterly earnings detail report that includes the following elements:

- year
- quarter
- employer account number
- employee Social security number
- Name
- Earnings paid during quarter
- Hours worked during quarter

Employer characteristics can be added to the earnings record. These include:

- Industry – North American Industry Classification System (NAICS) code
- Ownership – private or public (federal, state, local governments)
- Size of firm (monthly)

There is a lag between the time the employer files the report and the time the associated administrative data become available for research use. Both UI tax payments and earnings reports are due by the last day of the month following the last day of each quarter. Incorporating the earnings data in administrative databases takes the remaining two months of the quarter. Data are ready for use for research purposes early in the subsequent quarter. The process is summarized in Figure B1:

Figure B-1: Timing of collection and availability of UI earnings data

Current Year											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Quarter 1			Quarter 2			Quarter 3			Quarter 4		
Prior year Quarter 4 data submitted by employer and processed by ESD			Current year Quarter 1 data submitted by employer and processed by ESD			Current year Quarter 2 data submitted by employer and processed by ESD			Current year Quarter 3 data submitted by employer and processed by ESD		
Prior year Quarter 3 data available for research			Prior year Quarter 4 data available for research			Current year Quarter 1 data available for research			Current year Quarter 2 data available for research		