

NEW BACCALAUREATE SERIES

Comparison of the Employment and Earnings Outcomes of Washington Community College Baccalaureate Graduates and University Graduates



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This study examines employment and earnings outcomes for Bachelor's of Applied Science (BAS) degree-holders who graduated from a Washington community and technical college baccalaureate (CCB) program¹ in business, computer and information sciences, healthcare, and visual and performing arts. These graduates are compared to graduates from public regional four-year universities in Washington in similar program areas. The CCB sample includes a larger percentage of students of color than the university group because the CCB group is more racially diverse, but these groups' programs of study are as similar as possible given requirements that community college and university programs should not be duplicative. Results show both groups have high employment match rates in all four program areas, with CCB graduates demonstrating a slightly higher employment match rate than university graduates. Moreover, relatively small differences exist in initial earnings, and both groups show annualized earnings increases over time. However, we do see differences in earnings by gender and race that are larger within the CCB and university groups than between the groups.

BACKGROUND

CCB degrees have grown steadily since their inception in the early 90's, with 23 states now authorizing community colleges to confer baccalaureate degrees (Soler, 2019). Earlier studies of Washington CCB graduates, most of whom receive a Bachelor's of Applied Science (BAS) degree, show CCB students are older, with an average age of 32 in Washington state, and more racially and ethnically diverse than students in similar university programs (Meza, 2019; Blume, 2020). Similar to students in associates degree programs, CCB students tend to work full-time while also studying full-time, and many CCB students amass considerable workforce experience prior to enrolling in their bachelor's degree programs (Bragg & Soler, 2017).

In this study we compare the employment and earnings outcomes of Washington CCB graduates to bachelor's

graduates of regional public universities in similar programs. Our research is complimentary to research on employment and earnings conducted by Kaikkonen (2017, 2020) and also Kaikkonen and Quarles (2018) in that we seek to understand the labor market outcomes of BAS graduates. In their prior research, as well as our study reported in Data Note 7 on [Washington Bachelor's of Applied Science Graduate Employment and Earnings](#) (Meza & Bragg, 2020), we find high employment match rates as well as earnings growth over a 3-year period from the first to the twelfth quarter post-graduation. Of the four program areas we studied (business, computer and information sciences, healthcare, and visual and performing arts), healthcare BAS graduates have the highest earnings. While these results are promising, variation in earnings by gender and race are important to understand. Female BAS graduates lag behind males in business, healthcare, and visual and performing arts, with computer and information sciences being an exception. In this field, female BAS

¹ Nearly all Community College Baccalaureate (CCB) degrees in Washington state take the form of Bachelor's of Applied Science (BAS) degrees. We use both CCB and BAS terms in this brief, but we primarily use CCB to designate graduates of community colleges with baccalaureates from university graduates with baccalaureates.

graduates who initially trail their male counterparts are able to close the earnings gap and surpass males by one year after graduation.

Earnings results disaggregated by race are similarly nuanced, with whites tending to exceed other racial groups with some exceptions. For example, business, Latinx and Native American/Alaska Native BAS graduates' earnings are comparable or higher than white BAS graduates. In healthcare, African American BAS graduates lag behind other racial groups in the quarter after graduation but show a dramatic increase by the third year post-graduation wherein the annualized earnings of African-Americans exceed whites and close the gap with Asians.

RESEARCH QUESTIONS

This data note is our second on the employment and earnings of Washington BAS graduates.

Two questions guided our research on understanding the employment and earnings of Washington graduates:

1. How do the employment and earnings of CCB graduates compare to graduates of public regional universities in four comparable program areas?
2. How do the employment and earnings of CCB and university graduates in the four program areas vary by gender and race?

DATA AND METHODS

We used aggregate data provided to our Community College Research Initiatives (CCRI) group at the University of Washington-Seattle by the Washington Education Research Data Center (ERDC).² The dataset for this study provides aggregate data on labor market outcomes from the time Washington community and technical colleges began enrolling students in BAS programs in 2007 and subsequently began graduating BAS students starting in 2009. This study samples BAS graduates through 2017, which represents a period of extensive growth and maturation of BAS programs

in Washington state. By 2018, 20 out of the 34 community and technical colleges were graduating BAS students in at least one program area, and the majority were conferring BAS degrees in more than one program area (Jamilyn Penn, personal communication, February 18, 2020).

The sample for our analysis was drawn from the total population of 3,560 BAS degree earners in Washington state from 2007-2017. This sample was further culled to 2,345 to include graduates of four programs that have a comparable counterpart at any public regional university. That is, using the six-digit Classification of Instruction Program (CIP) codes as defined by the U.S. Department of Education's National Center for Education Statistics, a comparison sample of students earning baccalaureate degrees in four comparable programs at the state's public universities was constructed (n=17,324). We limited the selection of university students to a comparison group that enrolled in a program having a six-digit CIP code that matched an existing BAS program.³ The predominant program areas for both samples are business and healthcare, with the CTCs offering 28 baccalaureate degree options across the four program areas and the public universities offering 13 baccalaureate degree options across the same four program areas. Because of our comparison of graduates by program area, we provide a brief explanation of Washington BAS programs relative to university programs in similar fields of study.

BAS DEGREE PROGRAMS

In 2012 the state legislature updated the 2010 law expanding the authority of the SBCTC to approve BAS degree programs conferred by Washington community and technical colleges (for a fuller history of BAS degrees in Washington, see: <https://www.sbctc.edu/colleges-staff/programs-services/applied-baccalaureates/>). This legislation required that baccalaureate degrees adopted by CTCs demonstrate that they would meet emerging and distinctive workforce needs and also be non-duplicative of university baccalaureate degree programs. This non-duplication requirement is intended to reduce inefficiencies and cost, but introduces complexity about BAS versus bachelor's degree programs

² The CCRI obtained data for this and other studies of BAS programs through a formal data-sharing agreement with the Washington ERDC, a state agency that links data sets for P-20 education and the workforce. This agreement was also facilitated through a partnership of CCRI with the Washington State Board of Community and Technical Colleges (SBCTC).

³ These institutions are University of Washington – Bothell, University of Washington – Tacoma, Central Washington University, Eastern Washington University, Western Washington University, Washington State University – Pullman, and Washington State University's three branch campuses in Spokane, Tri-Cities, and Vancouver. The University of Washington campus in Seattle is not included.

conferred at the university level. Because of this complicating factor (Washington State Council of Presidents, 2017), it is important to construct and compare groups that are as similar as possible to each other. It is equally important, however, to recognize that there are differences in the programs of study offered by CTCs and universities that could impact employment and earnings outcomes. Specifically, the bachelor’s degrees conferred by CTCs are “applied” by definition, which means they emphasize the applied learning aspects of higher education. While most baccalaureate degrees integrate applied learning into their curriculum, BAS degrees emphasize this aspect of collegiate education (Townsend, Bragg, & Ruud, 2008). Understanding the potential for this complexity to confound results, we restricted our analysis to sampling graduates of bachelor’s degree programs in the exact same CIP codes to create as comparable a sample of the two groups as possible.

The ERDC data files also provide student demographics, as well as an “in-state covered employment match” between the BAS graduate data file maintained by the SBCTC and the state’s Unemployment Insurance (UI) wage data. We use the term “in-state covered employment match” (Blagg & Washington, 2020) as a descriptive proxy for employment, relying on these data to identify individuals classified as employed according to their existence in the quarterly UI wages maintained by the Washington Division of Employment Security (EDS). These data were provided to CCRI in aggregate for the first, fourth, and twelfth quarters after students graduated.

Also included in the employment data file are average quarterly earnings in the first, fourth and twelfth quarters after graduation. We computed year one and year three annualized earnings from these quarterly UI wage files according to recommended practice for analyzing UI wage data (Feldbaum & Harmon, 2012). Annualized earnings reported in this study are rounded to the nearest \$100 and adjusted for inflation.

BAS DEGREES AND DEMOGRAPHICS

Table 1 presents the number of graduates in the four program areas included in this study. These program areas have sufficient numbers of graduates between 2009 and 2017 to track employment outcomes in terms of the in-state covered employment match rate and wages in the first quarter, first year and third year after graduation. These

four program areas have been the basis of several studies conducted by Blume (2020), Meza (2019, 2020), and Meza and Bragg (2020) that use the following Classification of Instructional Programs (CIP) codes: business (CIP codes beginning in 52), visual and performing arts (CIP code 50), healthcare (CIP, 51) and computer and information sciences (CIP code 11). All of these program areas have at least 10 graduates, and in most cases, many more than 10, which is the minimum threshold for the ERDC to provide aggregate results using its privacy guidelines.

Table 1.
Washington Baccalaureate Graduates by Program Area

Program Area	CCB Graduates (n=2,345)	University Graduates (n=17,324)
Business	41.0%	58.9%
Computer & Info Sciences	11.3%	3.0%
Healthcare	32.1%	36.0%
Visual & Performing Arts	15.6%	2.1%

Further, to provide an understanding of the graduates in our study of employment and earnings, we describe the demographic makeup of CCB graduates and compare them to their counterparts graduating from public, regional universities. Table 2 shows CCB graduates are 60.2% white, 12.0% Asian, 4.3% African-American, 8.7% Latinx and 62.8% female.

The table also shows differences in student demographics by program, with white and Asian students making up a slightly larger percentage of graduates of the computer and information sciences program and a smaller share of graduates of the healthcare and business programs. The most popular program area for African-Americans is healthcare, where they make up 9.4% of graduates. We also see a higher percentage of Latinx graduates in the business program than other programs, with 13.7% of Latinx graduates in business.

Comparing Tables 2 and 3 we see a similar percentage of white graduates and female graduates among the CCB and university graduates. However, we also see a slightly smaller percentage of African-American graduates (4%) and Latinx graduates (7%) in the university sample than the CCB sample. Asian graduates are represented among university graduates at a slightly higher percentage (15%) than CCB graduates

Table 2. CCB Graduates by Program Area and by Race and Gender

Program Area	CCB Grads (No. & %)	Race				Gender	
		White (No. & %)	Asian (No. & %)	African American (No. & %)	Latinx (No. & %)	Female (No. & %)	Male (No. & %)
Business	962 (39.7)	572 (59.5)	89 (9.3)	21 (2.2)	132 (13.7)	562 (58.4)	399 (41.5)
Computer & Information Sciences	265 (10.4)	167 (63.0)	36 (13.6)	10 (3.8)	13 (4.9)	45 (17.0)	220 (83.0)
Healthcare	752 (31.0)	436 (58.0)	88 (11.7)	71 (9.4)	46 (6.1)	610 (81.1)	140 (18.6)
Visual & Performing Arts	366 (15.1)	237 (64.7)	68 (18.6)	<10	14 (3.8)	255 (70.0)	111 (30.3)
Total	2345 (100%)	1412 (60.2)	281 (12.0)	102 (4.3)	205 (8.7)	1472 (62.8)	870 (37.1)

(12%). Also, we see larger proportions of African-American graduates in healthcare and Latinx graduates in business in community colleges compared to universities.

These findings are similar to results reported by Blume (2020) in a detailed analysis of nursing and business. Blume observed CCB programs may be expanding access for women, Latinx and African-Americans in business. Though based on one state, these results suggest CCB degree-holders are more racially diverse than university graduates in business and healthcare, and comparably diverse in other programs. Previous research on enrollments has also shown that CCB students are older, with an average age of 32 (Meza, 2019), as compared to about 22 years for full-time undergraduates nationwide (Bustamante, 2019).

CCB AND UNIVERSITY GRADUATE EMPLOYMENT

We also examined employment outcomes of CCB graduates compared to university graduates using a UI wage employment match rate. The “in-state covered employment match” (Blagg & Washington, 2020) is based on graduates having quarterly Unemployment Insurance (UI) wage records in the Washington Employment Security Department (ESD) system. Whereas using UI wage records as a proxy for employment is considered one of the best methods of measuring employment available to researchers, there are limitations (Harmon & Feldbaum, 2012). This is because quarterly UI wage data do not include earnings for those not covered by UI, most notably graduates who are self-

Table 3. University Graduates by Program Area and by Race/Ethnicity and Gender

Program Area	University Grads (No. & %)	Race							Gender	
		White (No. & %)	Asian (No. & %)	African American (No. & %)	Latinx (No. & %)	American Indian/ Alaska Native (No. & %)	Native Hawaii/ Pacific Islander (No. & %)	Multi-race (No. & %)	Female (No. & %)	Male (No. & %)
Business	10,202 (58.6)	5770 (56.6)	1764 (17.3)	265 (2.6)	662 (6.5)	148 (1.5)	120 (1.2)	49 (<1)	4979 (48.8)	5215 (51.1)
Computer & Information Sc	523 (3.0)	294 (56.2)	99 (18.9)	33 (6.3)	47 (9.0)	<10 (<1)	<10 (<1)	<10 (<1)	173 (33.1)	345 (66.0)
Healthcare	6239 (35.9)	4060 (65.1)	646 (10.4)	341 (5.5)	434 (7.0)	116 (1.9)	22 (<1)	17 (<1)	5309 (85.1)	946 (15.2)
Visual & Performing Arts	360 (2.0)	276 (76.7)	32 (8.8)	<10	15 (4.2)	<10	<10	<10	282 (78.3)	77 (21.4)
Total	17,324	1040 (60.0)	2541 (14.7)	>639 (>3.7)	1158 (6.6)	264 (1.5)	142 (<1)	66 (<1)	10,743 (62.0)	6583 (38.0)

employed or who work for the federal government (civilian or military). In addition, these data only include earnings for those employed in the state, so they tell us nothing about the employment graduates who have left the state of Washington.

Our results in Figure 1 show CCB graduates have a higher in-state covered employment match rate than university graduates, especially in the first and fourth quarters. In the first quarter CCB grads have a 75% match versus a 69% match for university graduates; likewise in the fourth quarter CCB graduates show a 77% match whereas university graduates have a 70% match. The match rate of the two groups closes to be nearly equal by the twelfth quarter when both groups of graduates have a 70% match. The higher CCB employment match rate may be a result of the higher likelihood that university students move out of state than community college students (Blagg & Washington, 2020). CCB graduates are also older than university graduates and may have higher initial employment levels.

ANNUALIZED EARNINGS BASED ON AVERAGE QUARTERLY WAGES

Turning to an analysis of annualized earnings based on first, fourth, and twelfth quarter UI wage records after graduation in Table 4, we found similar earnings for both groups of graduates with some interesting differences. In all program areas but healthcare, CCB graduates are earning higher quarterly wages in the first and fourth quarters after graduation than university graduates. However, by the twelfth quarter, the earnings of university graduates in both healthcare and business exceed CCB graduates. Since CCB programs in computer and information sciences are so new, we are unable to calculate earnings based on the twelfth quarter following graduation. However, earnings in the first two time periods are higher for CCB graduates than university graduates.

In healthcare, we find the earnings of CCB graduates to be slightly lower than university graduates based on all three quarters of UI wage data. Both groups, but especially the university graduates, include a large number of nursing students and while CCB healthcare programs also graduate substantial numbers of nurses, these programs also include

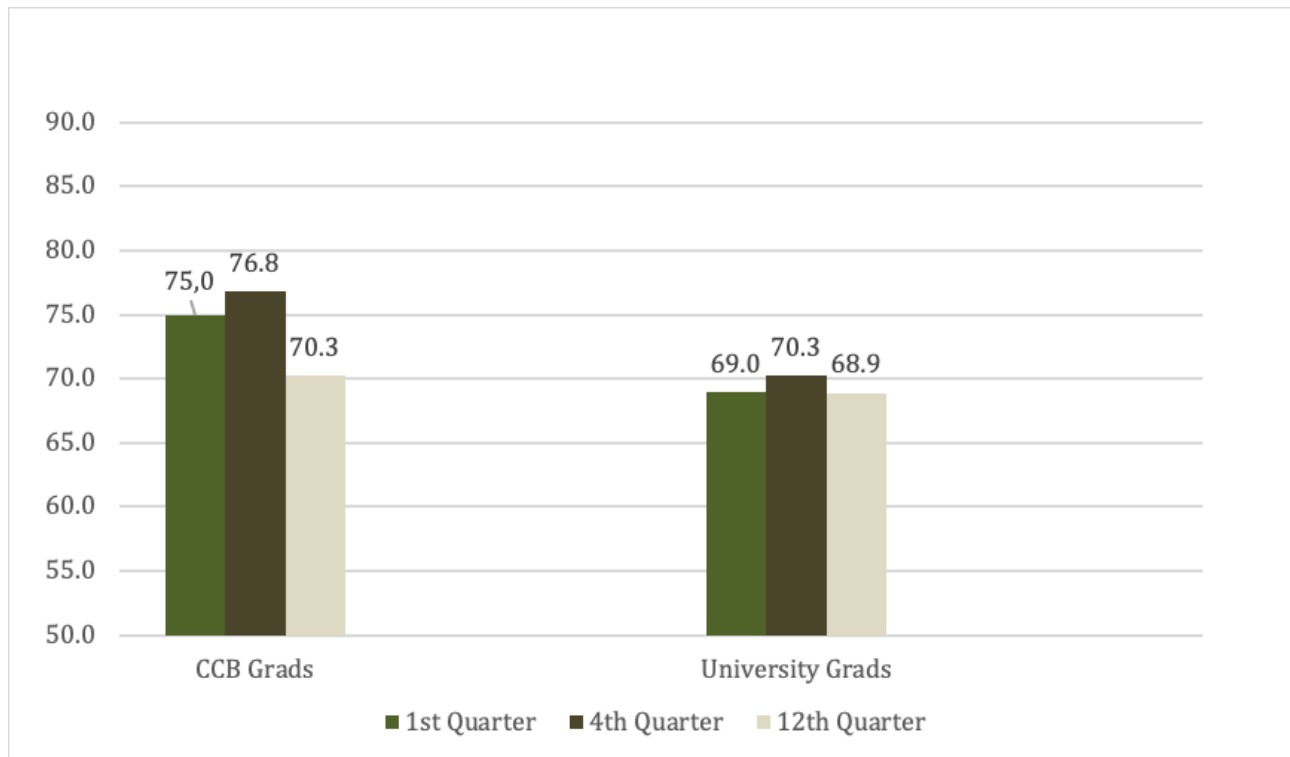


Figure 1. The in-state covered employment match rate by three designated quarters after CCB and university students graduate.

Table 4. Annualized Earnings in Four Program Areas Comparing CCB Graduates to University Graduates

Program Area	CCB Graduates			University Graduates		
	Annualized Earnings based on First Quarter Avg Earnings	Annualized Earnings based on Fourth Quarter Avg Earning	Annualized Earnings 3 based on Twelfth Quarter Avg Earnings	Annualized Earnings based on First Quarter Avg Earnings	Annualized Earnings based on Fourth Quarter Avg Earning	Annualized Earnings 3 based on Twelfth Quarter Avg Earnings
Business	\$40,000	\$45,200	\$49,200	\$32,400	\$42,000	\$53,200
Computer & Information Sciences	\$47,600	\$52,000	N/A	\$42,400	\$49,200	N/A
Healthcare	\$50,000	\$60,000	\$68,400	\$51,600	\$66,000	\$72,400
Visual & Performing Arts	\$32,800	\$39,600	\$50,000	\$23,600	\$38,800	\$48,400

Note: Annualized earnings based on average quarterly wages. For wage calculations, we only included students who had graduated post-2012.

other majors such as radiation and imaging, dental hygiene, respiratory care, public health, and community health. This difference in program composition might also influence the wages we found in healthcare.

To further analyze whether any of these wage differences are statistically significant we performed two-tailed t-tests for significance using the average wages in the fourth quarter or at approximately the end of the first year of employment. We assume this point provides enough time for graduates to settle into employment and there is a large enough sample size to conduct the analysis. What we find when we performed this analysis is that there are significant differences in wages between CCB graduates and university graduates in two areas only. First, the difference in the earnings of graduates in healthcare is statistically significant ($p < .01$, $t = 4.37$, $df = 3267$), with university graduates exceeding CCB graduates. In the second case, the difference in the earnings of CCB graduates and university graduates is statistically significant in business ($p = .01$, $t = 2.58$, $df = 4006$). In this area the earnings of CCB graduates is higher than university graduates, although as we noted earlier in this date note, this trend reverses itself by the twelfth quarter when university graduates earn more than CCB graduates.

ANNUALIZED EARNINGS BY RACE AND GENDER

In contrast to the relatively small differences that we find between the total group of CCB graduates and the total

group of university graduates, we find some important differences by race and gender when we disaggregate the overall groups. Table 5 summarizes annualized earnings by gender and shows that male graduates of both the CCB programs and university programs earn more than their female counterparts. In fact, the difference between male and female graduates is far greater than the difference between the overall group of CCB graduates and university graduates. The only area where female graduates earn more than male graduates is in the CCB computer and information sciences program wherein female graduates earned more than male graduates at one year past graduation, with annual earnings for CCB female graduates at \$60,800 compared to male graduates at \$50,400.

Turning to analyze annualized earnings by race for both CCB and university graduates we see consistently higher earnings for white students in both samples (Table 6). We also find too few African-American CCB graduates to make meaningful comparisons in business and computer and information sciences program areas. However the cell sizes are small but interpretable for African-American CCB and university healthcare graduates. In this comparison we see the lowest earnings of any racial group in the earnings of African-American CCB graduates in the first and fourth quarters, but by the twelfth quarter these CCB graduates are approaching parity with their university peers.

Further, Asian graduates of business programs and computer and information sciences programs have lower wages than

Table 5. Annualized Earnings for CCB and University Graduates by Gender

Program Area	Female			Male		
	Annualized Earnings based on First Quarter Avg Earnings	Annualized Earnings based on Fourth Quarter Avg Earning	Annualized Earnings based on Twelfth Quarter Avg Earnings	Annualized Earnings based on First Quarter Avg Earnings	Annualized Earnings based on Fourth Quarter Avg Earning	Annualized Earnings based on 3 based on Twelfth Quarter Avg Earnings
CCB Graduates						
Business	\$36,400	\$40,800	\$46,000	\$45,200	\$50,800	\$53,200
Comp & Info Sci	\$37,200	\$60,800	N/A	\$49,200	\$50,400	N/A
Healthcare	\$48,000	\$57,600	\$65,200	\$58,400	\$70,800	\$80,800
Visual & Performing Arts	\$30,000	\$37,600	\$46,400	\$38,000	\$43,600	\$59,200
University Graduates						
Business	\$31,600	\$40,800	\$50,400	33,200	42,800	56,000
Comp & Info Sciences	\$38,000	\$46,000	N/A	42,800	49,600	N/A
Healthcare	\$51,200	\$65,600	\$71,600	52,400	69,200	\$77,200
Visual & Performing Arts	\$25,200	\$39,200	\$52,400	33,200	42,800	\$56,000

Note: Cells with N/A did not have a large enough number of students for the computation.

Table 6. Annualized Earnings for CCB and University Graduates by Race

Program Area	White		African American		Asian		Latinx		Native American/ Alaska Native	
CCB Graduates										
Business	1Q	\$40,400	1Q	\$28,000	1Q	\$33,600	1Q	\$42,800	1Q	\$36,800
	4Q	\$45,600	4Q	N/A	4Q	\$40,400	4Q	\$45,600	4Q	\$44,000
	12Q	\$51,200	12Q	N/A	12Q	\$33,600	12Q	\$52,800	12Q	N/A
Comp & Info Sciences	1Q	\$49,200	1Q	N/A	1Q	\$36,000	1Q	\$57,600	1Q	N/A
	4Q	\$53,600	4Q	N/A	4Q	\$42,000	4Q	N/A	4Q	N/A
	12Q	N/A	12Q	N/A	12Q	N/A	12Q	N/A	12Q	N/A
Healthcare	1Q	\$52,000	1Q	\$42,000	1Q	\$50,400	1Q	\$46,400	1Q	N/A
	4Q	\$62,800	4Q	\$54,000	4Q	\$58,800	4Q	\$62,800	4Q	N/A
	12Q	\$72,000	12Q	\$74,600	12Q	\$77,600	12Q	N/A	12Q	N/A
University Graduates										
Business	1Q	\$34,000	1Q	\$31,600	1Q	\$27,600	1Q	\$31,600	1Q	\$33,200
	4Q	\$43,600	4Q	\$40,800	4Q	\$38,400	4Q	\$39,600	4Q	\$42,800
	12Q	\$55,200	12Q	\$55,200	12Q	\$50,400	12Q	\$48,800	12Q	\$54,000
Comp & Info Sciences	1Q	\$48,400	1Q	\$34,400	1Q	\$33,600	1Q	\$37,200	1Q	N/A
	4Q	\$51,600	4Q	\$44,400	4Q	\$43,200	4Q	\$46,800	4Q	N/A
	12Q	N/A	12Q	N/A	12Q	N/A	12Q	N/A	12Q	N/A
Healthcare	1Q	\$52,000	1Q	\$58,400	1Q	\$57,600	1Q	\$45,200	1Q	\$44,400
	4Q	\$66,000	4Q	\$72,400	4Q	\$68,000	4Q	\$63,600	4Q	\$55,600
	12Q	\$71,600	12Q	\$76,800	12Q	\$75,600	12Q	\$70,800	12Q	\$65,600

Note: Results were not included for visual and performing arts due to low cell sizes.

other racial groups in both samples. In earlier research looking at CCB student demographics Meza (2019) found some evidence that Asian students are, on average, younger than their CCB peers and therefore may have less work experience that contributes to lower wages. Latinx graduates who complete CCB degrees in business have higher wages than their university counterparts and again, this finding may have to do with the Latinx graduates having more work experience relative to their university business graduates. More data on student demographics and earnings is needed to examine this question and discern a more nuanced understanding of labor market outcomes for CCB graduates in comparison to university graduates in similar program areas.

CONCLUSIONS

These results show CCB graduates are more diverse than their university counterparts, and these demographic differences need to be accounted for to understand labor market outcomes. Carefully constructing comparison groups is very important. When comparable programs are analyzed, we find CCB graduates exhibit higher employment match rates than university graduates, and we also see their earnings tend to be higher than university graduates, especially in the first year following graduation. Looking at three years past graduation, we find both groups show strong growth in earnings with some evidence that university graduates catch and surpass CCB graduate earnings. Whether this trend will continue is unknown, and calls for additional longitudinal data on labor market outcomes.

We also find a difference in earnings by gender, with the earnings of male graduates exceeding female graduates with either the CCB or university degree. These wage differences are substantial, especially in healthcare. We also see some differences in annualized earnings by race, with some wage gaps closing over time for racially minoritized groups, i.e., African-American CCB graduates in healthcare. Again, whether this trend will be apparent over time is unknown and calls for research on student-level data sets that allow for multi-variate statistical analysis. If this research can also delve more deeply into features of programs of study and other factors, including more data on programs, employment, and other contextual factors, it will be possible to build a more comprehensive understanding of the impact of CCB programs (versus university programs) on labor market outcomes.

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