

EDUCATION PAYS, BUT IT PAYS MORE FOR SOME THAN OTHERS

A CORRELATIONAL STUDY OF EDUCATIONAL ATTAINMENT, INDUSTRY, & EARNINGS

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ACKNOWLEDGEMENT

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EXECUTIVE SUMMARY

The purpose of this correlational study was to examine the relationship between formal education and wages, investigate the existence of inequitable wage gaps defined by demographic subgroups, and identify differences in wages related to the choices people make in their level of educational attainment and field of study. Researchers investigated four questions:

1. Does more formal education lead to greater wages?
2. Are there wage gaps between men and women that cannot be explained by educational attainment, major field of study, or industry of employment?
3. Are there wage gaps between racial and ethnic groups that cannot be explained by educational attainment, major field of study, or industry of employment?
4. Can students improve their earnings based on what they study in college?

KEY FINDINGS



Higher levels of educational attainment were associated with greater wages for both genders, all racial and ethnic groups, and all age groups studied.



Females earned approximately 13 percent less than males on average after holding constant age, race and ethnicity, level of education, and college major.



People who identified as White ranked third in wages among all racial groups studied. However, after controlling for educational attainment and college major, people who identified as White earned more than all other racial groups.



Asians were more likely to earn postsecondary credentials in STEM fields of study and find employment in STEM-related industries. Their choice of college majors largely explained why they ranked the highest earners overall before controlling for education.



The payoff of higher education was greatest for those who pursued STEM-related majors or majors in legal studies, business, or construction trades.



People who attained less formal education but studied certain STEM and career-oriented fields of study earned more than others who attained more formal education.

INTRODUCTION

In United States, education has historically been broadly seen as a solution for economic mobility. However, rising college costs and mounting student debt have raised questions about the relationship between formal education¹ and wages. To answer these questions, students and other stakeholders have advocated for more information on the costs and benefits of college enrollment.

The federal government, state governments, and philanthropic organizations have responded to this call for more transparent college and career information by supporting the production of online searchable data systems. The US Department of Education launched the College Navigator, which provides students with information that describes each postsecondary institution in the US, their graduation rates, transfer rates, and net price (USDE, 2020). The Georgetown University Center on Education and the Workforce created the College Scorecard, which provides student debt, completion rates, and net present value estimates of future earnings minus college costs for over 4,500 colleges and universities (CEW, 2020). Finally, the American Institute for Research has developed Launch My Career Florida and Launch My Career Utah to help students in these states make informed choices related to their major fields of study (AIR, 2021).

¹ The institutional process of teaching and learning that awards students' certifications for their acquired knowledge and skills.

These online, searchable data systems function as consumer-information tools that aim to help students and parents make informed college choices. These systems intend to allow students to observe the particulars of different colleges and universities and use this information to form expectations about the unique benefits and costs that will result from enrolling in a particular college program of study. Ultimately, these tools aim to empower students to make informed college and career decisions.

This study focuses on the education-wage relationship. It builds on the data tools referenced above by using a rich student-level data system to disaggregate average wages by educational attainment, major field of study, student gender, race, and ethnicity. This correlational study investigated the following research questions:

- Does more formal education lead to greater wages?
- Are there wage gaps between men and women that cannot be explained by educational attainment, major field of study, or industry of employment?
- Are there wage gaps between racial and ethnic groups that cannot be explained by educational attainment, major field of study, or industry of employment?
- Can students improve their earnings based on what they study in college?

RESEARCH DESIGN

This study answers the above research questions using a correlation, explanatory research design using cross-sectional data. It answers the research questions in two stages. First, this study presents a trends and bivariate analysis of annual wages in the first year following the highest educational degree attained (hereafter referred to as 'annual wages').

In this first part, the study sample was defined by all individuals aged 16 to 64 who were employed by a Texas employer from 2005 to 2017. Wages were expressed in 2018 dollars. Levels of educational attainment were defined by high school diploma, community college certificate, associate degree, bachelor's degree, and graduate degree. Certificates only include those issued by community colleges and not industry groups.

In the second part, this study used multivariable regression analysis to explain changes in annual wages. This approach allowed researchers to examine one explanatory variable's correlation with wages while controlling for other explanatory variables. In this analysis, the log of annual wages was regressed on age when highest degree was earned (a continuous variable, not age group), racial group, educational attainment, and postsecondary major. Year dummies were also included to control for the influence of the business cycle on wages.



The dependent variable was the log of annual wages. This transformation of annual wages reduced unexplained variation and allowed regression coefficients to be interpreted as an independent variable's influence on wages as a percent of change in wages.

Because this second part of the study was interested in relating college majors to wages, the study sample had to exclude people who did not earn a college degree or certificate. This study sample, which amounted to 1,352,960 observations, was defined by postsecondary degree or certificate holders aged 16 to 64 who were employed by a Texas employer from 2005 to 2017.

The multivariable regression model explained a meaningful amount of variation in wages. The R^2 value was approximately 0.15. Furthermore, as shown in Table 3, nearly all regression coefficients were statistically significant (Robust standard errors were reported in parenthesis). However, the meaningfulness of coefficients must be judged by the size of the coefficients.

STUDY LIMITATIONS

The relationships identified in this study were not causal. They were correlational.

This study does not control for a person's talent or ability independent of their education. As such, variation in wages associated with variation in educational attainment may be influenced by variation in ability. But, because ability is not controlled for, the effect of education on wages may be overstated. Some studies have investigated the magnitude of this overestimation. Researchers have found that ability plus other factors outside of education may explain about 10 percent of the schooling effect on wages (Card, 2001; Griliches, 1970)—a finding that suggests overestimation is present but not to the point of making education effect sizes meaningless.

Other study limitations include missing wage data from wages earned from self-employment, uncertainty in the returns to and costs of education, and the material and psychic costs of schooling.

Finally, we cannot presume that all students pursue education with the goal of maximizing wages.



FINDINGS

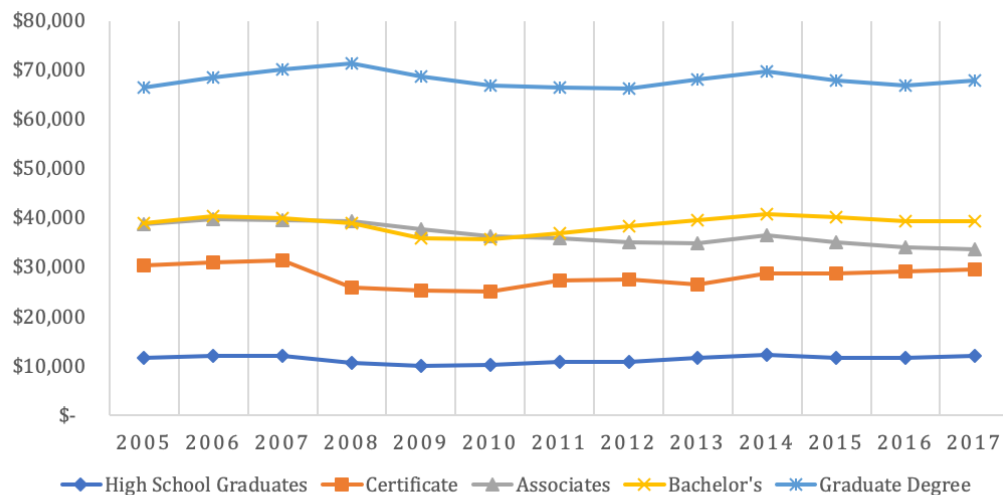
DOES GREATER EDUCATION LEAD TO GREATER WAGES?

As shown in Figure 1, annual wages grew, on average, as individuals attained more formal education. Texas residents who obtained a graduate degree earned the highest wages (\$68,206), followed by those who obtained a bachelor's degree (\$38,960), then an associate (\$36,450), followed by a certificate (\$28,010), and finally a high school degree (\$11,431).

Gaining one more level of education made a positive difference on income levels for every level of education, though it made more of a difference at certain milestones. The change between high-school-only to certificate holder was the most significant. The average high school degree holder who went on to earn a certificate increased their wages by 145 percent. The average certificate holder who went on to earn an associate degree improved their wages by 30 percent. The average associate degree holder who extended their education to earn a bachelor's degree increased their wages the least, by 7 percent. The second largest gain was achieved by the average bachelor's degree holder who earned a graduate degree, gaining 75 percent more in wages.

However, certain degrees were more resilient to downturns in the economy than others. Certificate holders experienced the largest and most sudden drop following the 2008 financial crisis. Following the Great Recession in 2008, those with bachelor's degrees pulled ahead of those with only an associate degree by a margin of \$9,893 (or 33.4 percent) in fiscal year (FY) 2017. This history of wage fluctuations suggests that resilience to downturns also distinguishes the value of different levels of education.

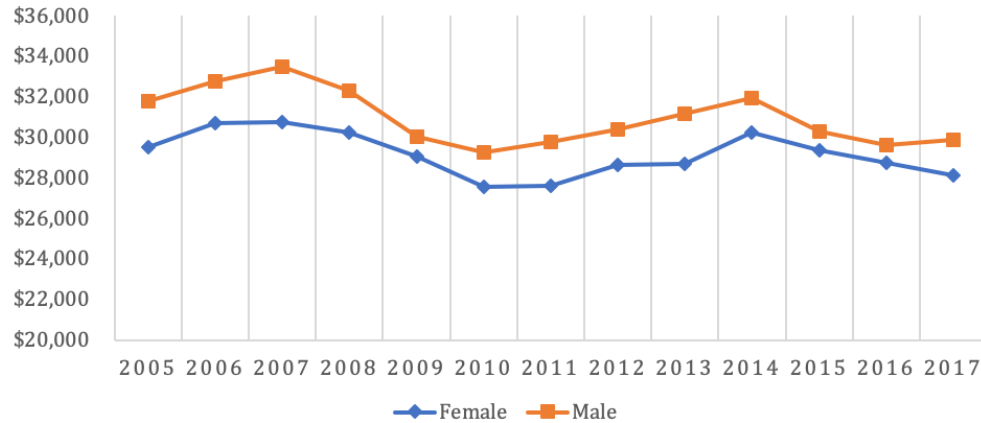
FIGURE 1: TIME SERIES OF ANNUAL WAGES IN FIRST YEAR FOLLOWING HIGHEST DEGREE EARNED OF EMPLOYED TEXANS AGES 16 TO 64, 2005-2017



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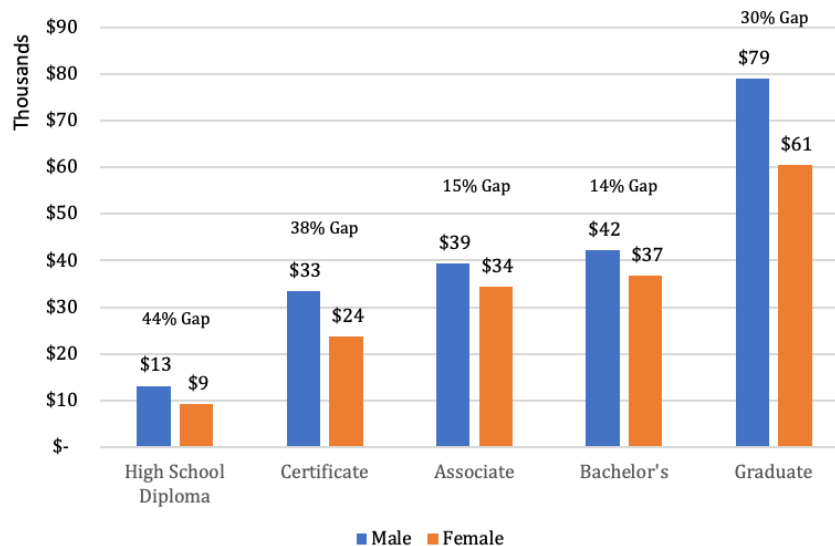
Gender. The average wage gap between men and women persisted, as shown in Figure 2. Males earned higher wages than females over the study period, though it varied across time. The gender wage gap was widest at 7.6 percent in the FY 2006, was its narrowest at 3.1 percent in FY 2017, and then settled at 6.1 percent in FY 2018.

FIGURE 2: TIME SERIES OF ANNUAL WAGES EARNED BY GENDER OF EMPLOYED TEXANS 16 TO 64, 2005-2017



The gender wage gap existed across all levels of education, as shown in Figure 3. Males who completed a bachelor's degree earned higher wages than female bachelor's degree holders by an average of 13 percent. The gender wage gap widened at lower educational degrees, reaching its widest for those who only hold a high school degree at a gap of 44 percent. Also notable was the 30 percent gap between men and women who earned a graduate degree.

FIGURE 3: ANNUAL WAGES (IN \$1,000) EARNED IN FIRST YEAR FOLLOWING HIGHEST DEGREE EARNED BY GENDER AND HIGHEST DEGREE EARNED OF TEXANS AGED 16 TO 64, 2005-2017



Women were either more responsive to the higher wages that follow higher levels of education, more responsive to education, or both. As shown in Table 1, females reached higher levels of education than males. Before entering the workforce, 68 percent of females attained some level of postsecondary education, as compared to 53 percent of males entering the workforce.

TABLE 1: DISTRIBUTION OF THE HIGHEST EDUCATIONAL DEGREE ATTAINMENT BY GENDER

	High School Only	Certificate	Associate Degree	Graduate Degree	Total
Female	32.4%	9.2%	37.9%	11.3%	100%
Male	46.9%	7.4%	29.7%	8.6%	100%

Race and Ethnicity. People identified as White comprised the largest racial group (48 percent), followed by Hispanics (34 percent), Blacks (13 percent), Asians (3 percent), and other races or combination of races (2 percent). Hereafter, people’s race and ethnicity will be described as race or racial groups.

Educational attainment levels varied across racial groups, as shown in Table 2. More than half (55 percent) of Hispanics entered the workforce with only a high school degree. For Black, White, Asian and others, this figure was 46 percent, 32 percent, 11 percent, and 33 percent, respectively.

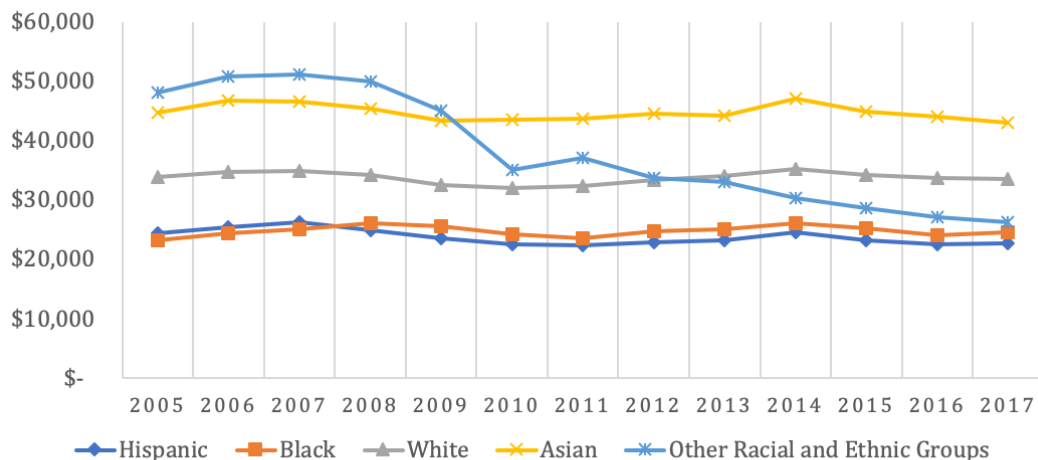
Conversely, Hispanics were the least likely to attain a graduate degree, 4 percent. For Black, White, Asian and others, this figure was 9 percent, 12 percent, 20 percent, and 34 percent, respectively.

TABLE 2: DISTRIBUTION OF THE HIGHEST EDUCATIONAL DEGREE ATTAINMENT BY RACIAL GROUPS

	High School Only	Certificate	Associate Degree	Bachelor's Degree	Graduate Degree	Total
Hispanic	54.9%	7.6%	7.5%	25.6%	4.4%	100%
Black	46.3%	9.6%	7.6%	27.4%	9.0%	100%
White	31.5%	6.8%	8.8%	41.1%	11.8%	100%
Asian	11.1%	5.1%	7.7%	55.7%	20.4%	100%
Other Races	32.6%	3.6%	5.3%	24.6%	33.9%	100%

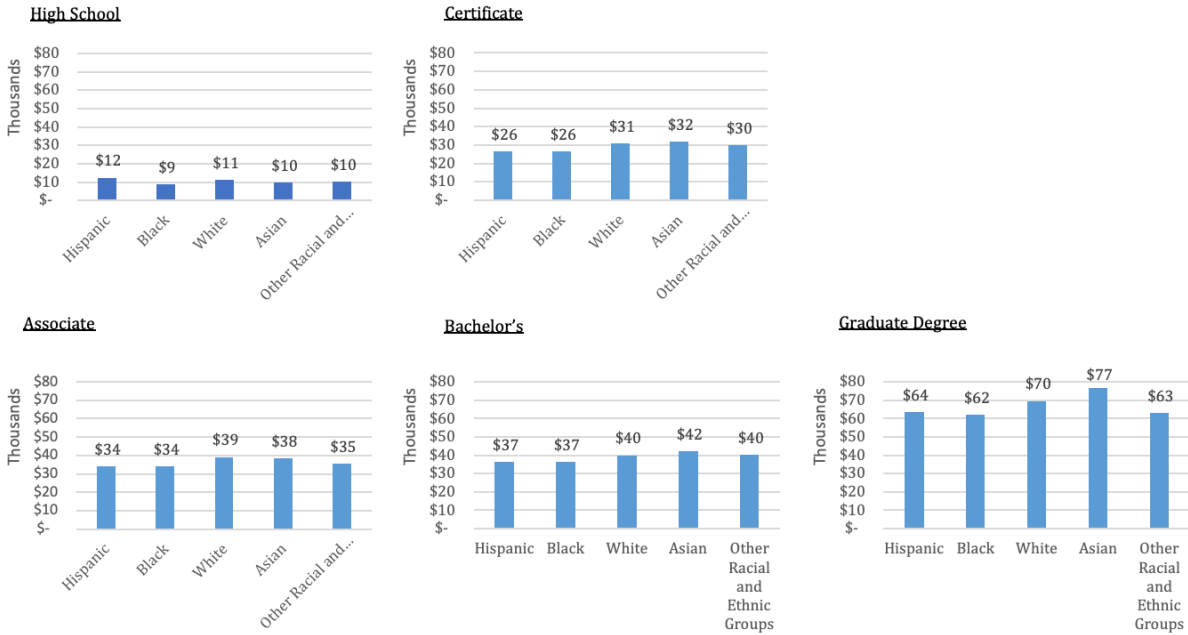
Annual wages also varied by race, as shown in Figure 4. Asians earned the highest wages (\$44,736), followed by other races (\$37,528), and then Whites (\$33,786). Finally, Blacks (\$24,803) and Hispanics (\$23,579) earned the least. Such wage variation can partially be explained by differences in educational levels.

Another pattern illustrated in Figure 4 was a dramatic decline in wages of people who identified as being of other or more than one race (“Other”). This group’s wage variability across years was likely due to its relatively small size and diverse and changing composition.

FIGURE 4: TIME SERIES OF ANNUAL WAGES EARNED BY RACIAL AND ETHNIC GROUPS OF TEXANS AGED 16 TO 64, 2005-2017

As mentioned earlier, wage differences by race can partially be explained by differences in their educational attainment levels. But education degrees do not fully explain wage differences, as shown in Figure 5. Whites and Asians consistently earned more money than Blacks and Hispanics at each postsecondary educational level. For certificate holders, Blacks and Hispanics earned lower wages than Whites and Asians combined by 19 percent and 23 percent, respectively. They earned lower wages than Whites and Asians by 15 percent and 12 percent among associate degree holders, respectively, and 8 percent and 14 percent among bachelor's degree holders. Lastly, for graduate degree holders, Blacks and Hispanics earned less by 11 percent and 22 percent compared to wages of Whites and Asians, combined.

FIGURE 5: ANNUAL WAGES (IN \$1,000) EARNED IN FIRST YEAR FOLLOWING HIGHEST DEGREE EARNED BY RACIAL AND ETHNIC GROUPS AND BY HIGHEST DEGREE EARNED OF TEXANS AGED 16 TO 64. 2005-2017



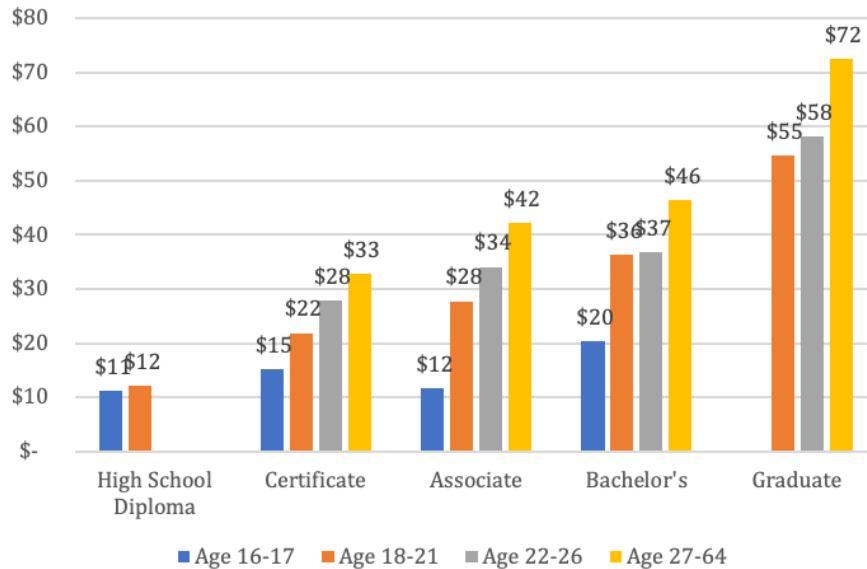
Age. The study sample was divided into four quartiles according to people's age when they attained their highest educational degree. The first quartile contained individuals aged 16 to 17. The second quartile contained individuals aged 18 to 21. The third quartile contained individuals aged 22 to 26. And the fourth and final quartile contained individuals aged 27 to 64. Though this last group had a wide range, its median age equaled 34.

People typically completed their formal education careers early in their adult life. Approximately 88 percent of the study sample was younger than 34 years old when they attained their highest degree. Because of this pattern, the oldest two age groups (22-26 and 27-64) had no one who completed their formal education with only a high school degree. Conversely, the youngest age group (16-17) had no person who completed their formal education with a graduate degree.

When people completed a degree at an older age their wages increased and by a little more than people who completed the same degrees at a younger age, as shown in Figure 6. These wage changes correspond to additional education and experience. The largest differences were realized for those who completed their associate and bachelor's degrees. Those who completed an associate or bachelor's degree after aging into the second age quartile (18-21) earned approximately \$16,000 more. This does not mean people should put off completing their degrees as it does not account for the missed opportunity of earning higher wages earlier in life. But it does suggest that completing a higher degree at any age was valued by the labor market.

At \$72,000, the highest average wage was reached by those who completed a graduate degree in the fourth age quartile (with median age of 34). The smallest marginal gain of \$1,000 was realized by those who completed their bachelor's degree in the third age quartile (22-26) as compared to those who completed in the second age quartile (18-21).

FIGURE 6: ANNUAL WAGES EARNED IN FIRST YEAR FOLLOWING HIGHEST DEGREE EARNED BY AGE GROUPS AND HIGHEST DEGREE EARNED OF TEXANS (IN \$1,000), 2005-2017

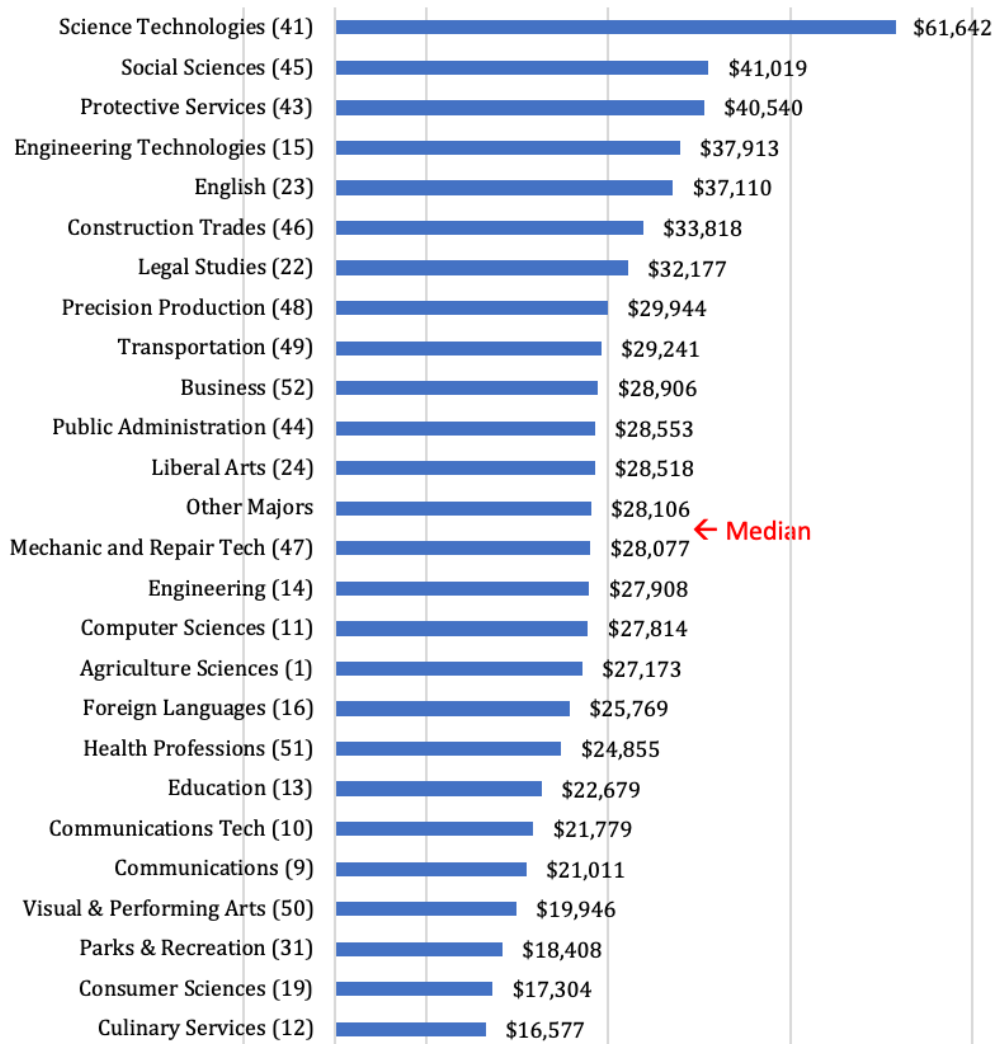


Academic Major. People pursued different major fields of study (i.e., majors) at every level of postsecondary education and these majors were highly predictive of expected wages. Overall, STEM majors consistently predicted that graduates would earn above average wages, some twice as high as median wages for their degree level. Moreover, STEM majors of lower level postsecondary degrees often earned more than non-STEM majors who earned higher levels of postsecondary education. Majors were identified using the federal government's two-digit Classification of Instructional Program code.

Of the certificate holders, those who majored in science technologies earned the highest average wage of \$61,642—a figure more than twice the median wage (\$28,092) earned by all certificate holders, as shown in Figure 15. Those who majored in social sciences (\$41,019), protective services (\$40,540), engineering (\$37,913), and English (\$37,110) made up the remaining top-five average wage majors.

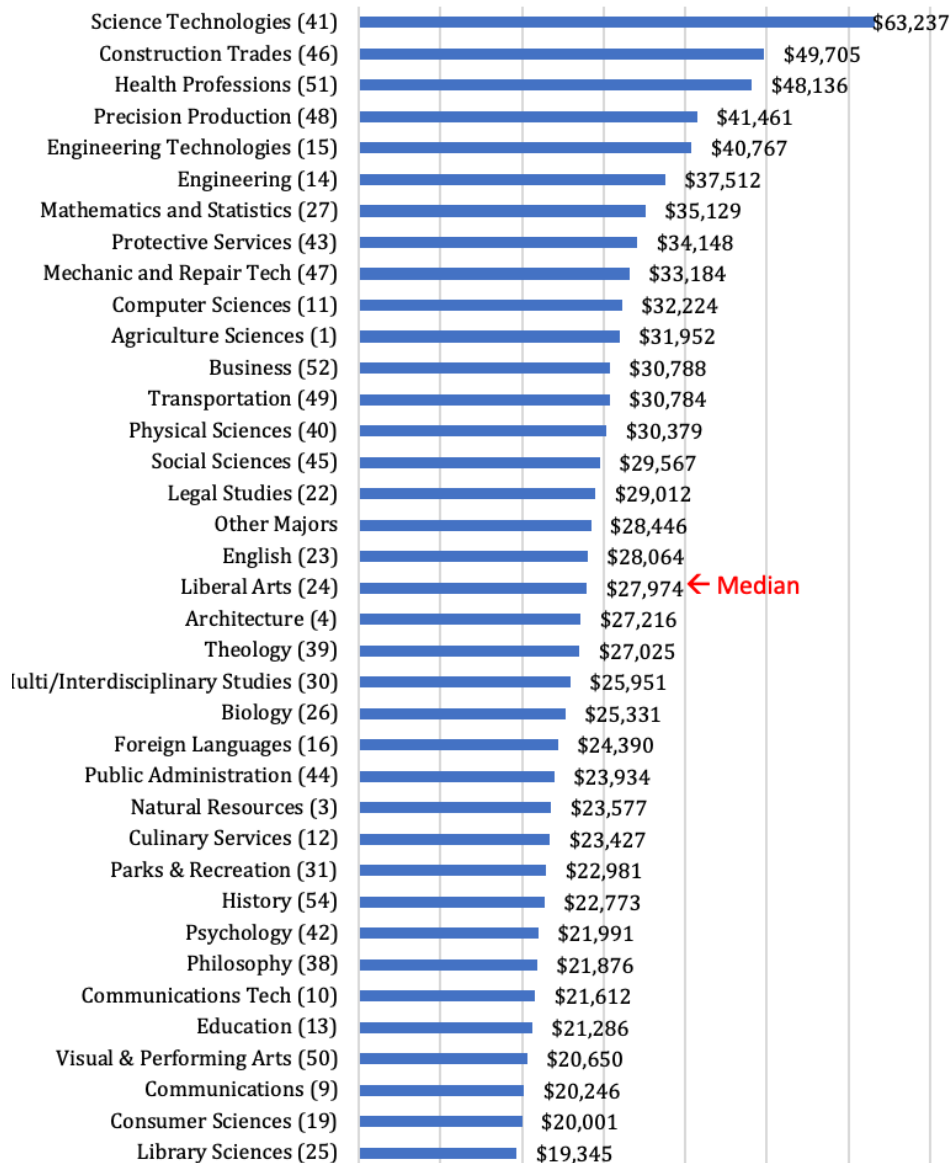
At the other end of the wage distribution were people who choose majors that lead to below average wages. People who majored in visual and performing arts (hereafter referred to as 'arts') (\$19,946), parks and recreation (\$18,408), consumer sciences (\$17,304), and culinary services (\$16,577) selected majors that led to the five lowest average annual wages.

FIGURE 7: AVERAGE ANNUAL WAGES EARNED IN FIRST YEAR FOLLOWING COMMUNITY COLLEGE CERTIFICATE EARNED BY MAJOR FIELD OF STUDY OF TEXANS AGED 16 TO 64, 2005-2017



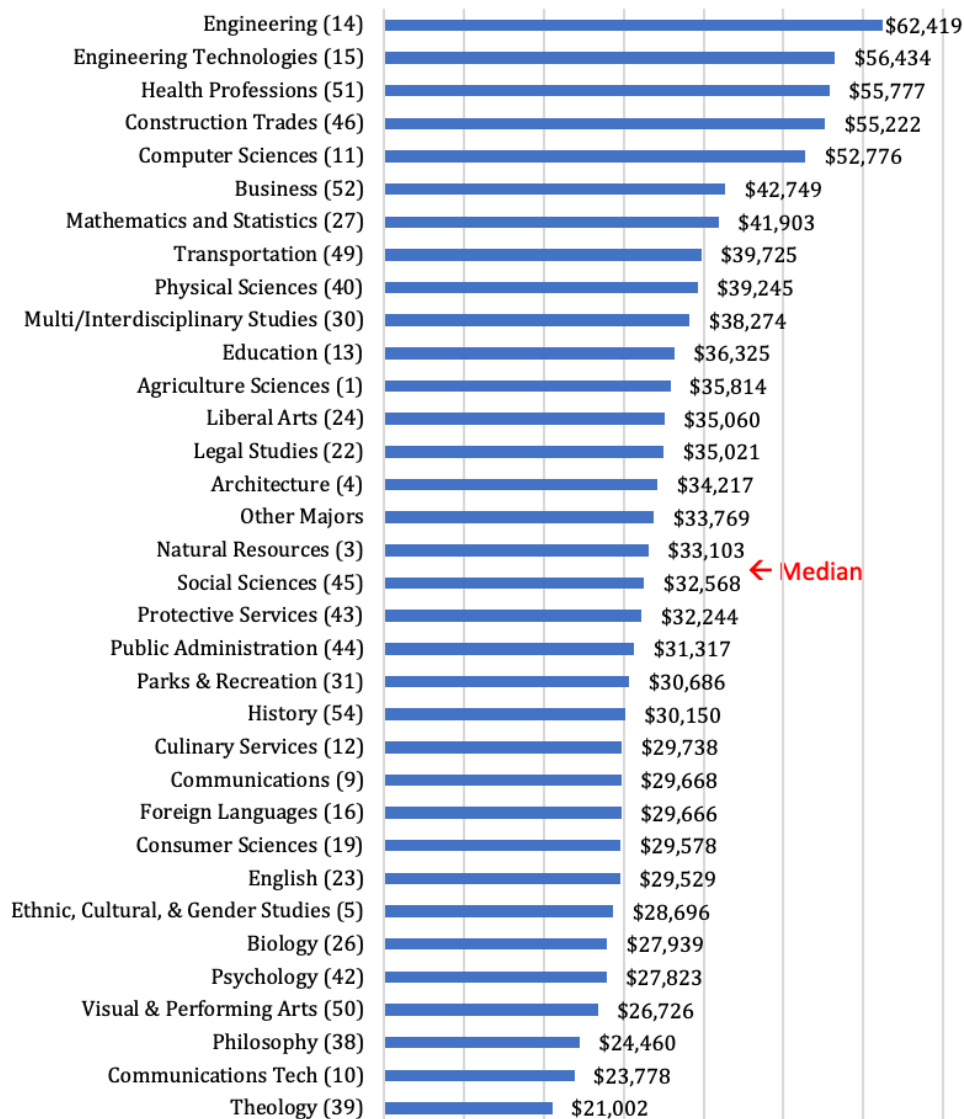
Of associate-degree holders, people who majored in science technologies earned the highest average wage, \$63,237—more than twice the median wage (\$27,974) of those who earned an associate degree. Those who majored in construction trades (\$49,705), health professions (\$48,136), precision production (\$41,461), engineering technologies (\$40,767), and engineering (\$37,512) selected majors that represented the other top-five highest average earning majors. In contrast, people who majored in library sciences (\$19,345), consumer sciences (\$20,001), communications (\$20,246), arts (\$20,650), and education (\$21,286) choose majors that led to the five lowest average annual wages.

FIGURE 8: AVERAGE ANNUAL WAGES EARNED IN FIRST YEAR FOLLOWING ASSOCIATE DEGREE EARNED BY MAJOR FIELD OF STUDY OF TEXANS AGED 16 TO 64, 2005-2017



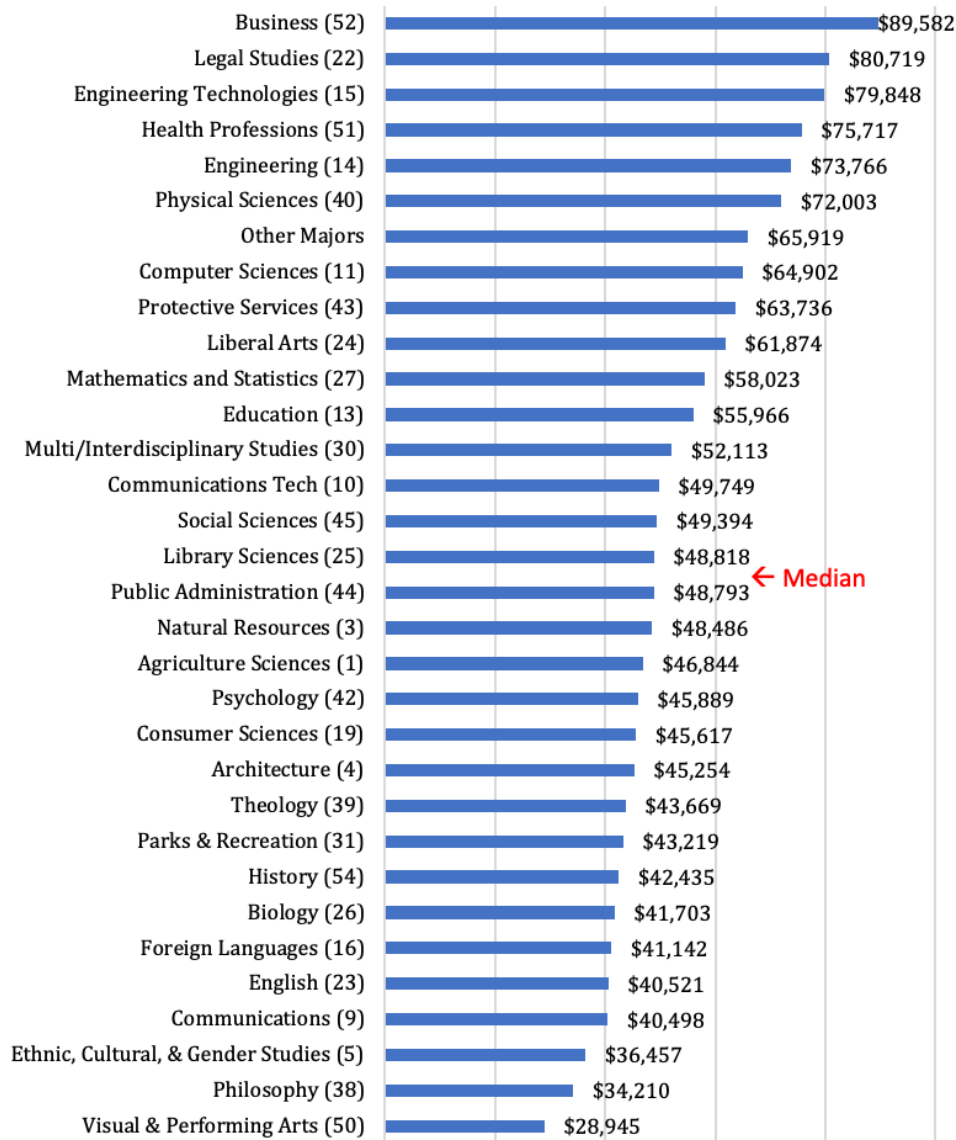
As shown in Figure 9, of bachelor's-degree holders, those who majored in engineering earned the highest average wage of \$62,419—a figure nearly twice the median wage (\$32,835) earned by all bachelor's degree holders. Those who majored in engineering technologies (\$56,434), health professions (\$55,777), construction trades (\$55,222), and computer science (\$52,776) selected majors that comprised the remaining top-five average earning majors. In contrast, people who majored in psychology (\$27,823), arts (\$26,725), philosophy (\$24,460), communications tech (\$23,778), and theology (\$21,002) selected majors that led to the five lowest average annual wages.

FIGURE 9: AVERAGE ANNUAL WAGES EARNED IN FIRST YEAR FOLLOWING BACHELOR'S DEGREE EARNED BY MAJOR FIELD OF STUDY OF TEXANS AGED 16 TO 64, 2005-2017



As shown in Figure 10, of the graduate-degree holders, those who majored in business earned the highest average annual wage of \$89,582—a figure nearly twice the median wage (\$48,806) earned by all graduate degree holders. Those who majored in legal studies (\$80,719), engineering technologies (\$79,848), health professions (\$75,717), and engineering (\$73,766) selected majors that comprised the remaining top-five earning majors. In contrast, people who majored in English (\$40,521), communications (\$40,498), ethics, cultural and gender studies (\$36,457), philosophy (\$34,210), and arts (\$28,945) selected majors that led to the five lowest average annual wages.

FIGURE 10: AVERAGE ANNUAL WAGES EARNED IN FIRST YEAR FOLLOWING GRADUATE DEGREE EARNED BY MAJOR FIELD OF STUDY OF TEXANS AGED 16 TO 64, 2005-2017





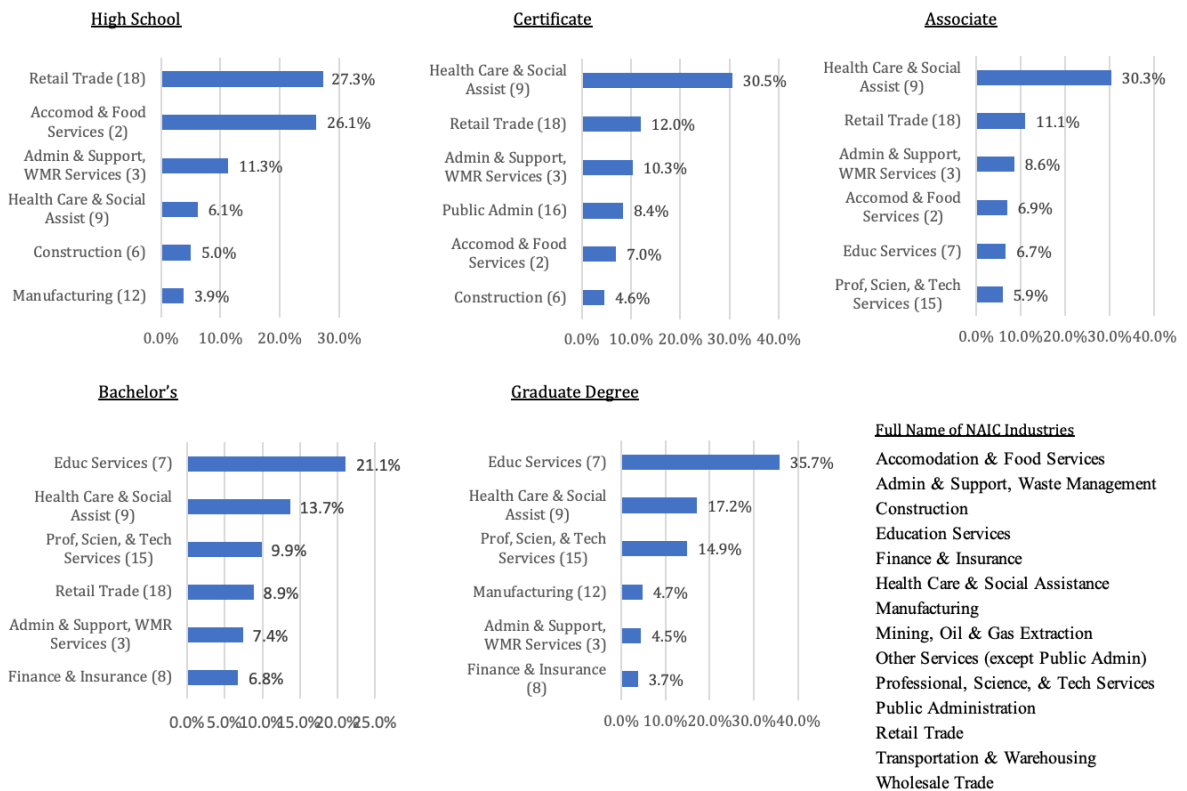
INDUSTRY

Where people found employment varied by educational attainment, as shown in Figure 11. Most people who only had a high school degree found employment in retail trade (27.3 percent) and accommodation and food services sectors (26.1 percent). For those who attained a certificate, a majority found employment in health care and social assistance (30.5 percent), retail trade (12 percent), and administrative services, support services, waste management, and remediation services (hereafter referred to as administrative and support services) (10.3 percent). Similarly, most associate-degree holders found employment in health care and social assistance (30.3 percent), retail trade (11.1 percent), and administrative and support services (8.6 percent).

Employment patterns changed for those who attained a bachelor's or graduate degree. A majority of bachelor's-degree holders found employment in education services (21.1 percent), health care and social assistance (13.7 percent), professional, scientific, and technical services (9.9 percent), and retail trade (8.9 percent). While most graduate-degree holders found employment in education services (35.7 percent), health care, and social assistance (17.2 percent), a significant share also found employment in professional, scientific, and technical services (14.9 percent).

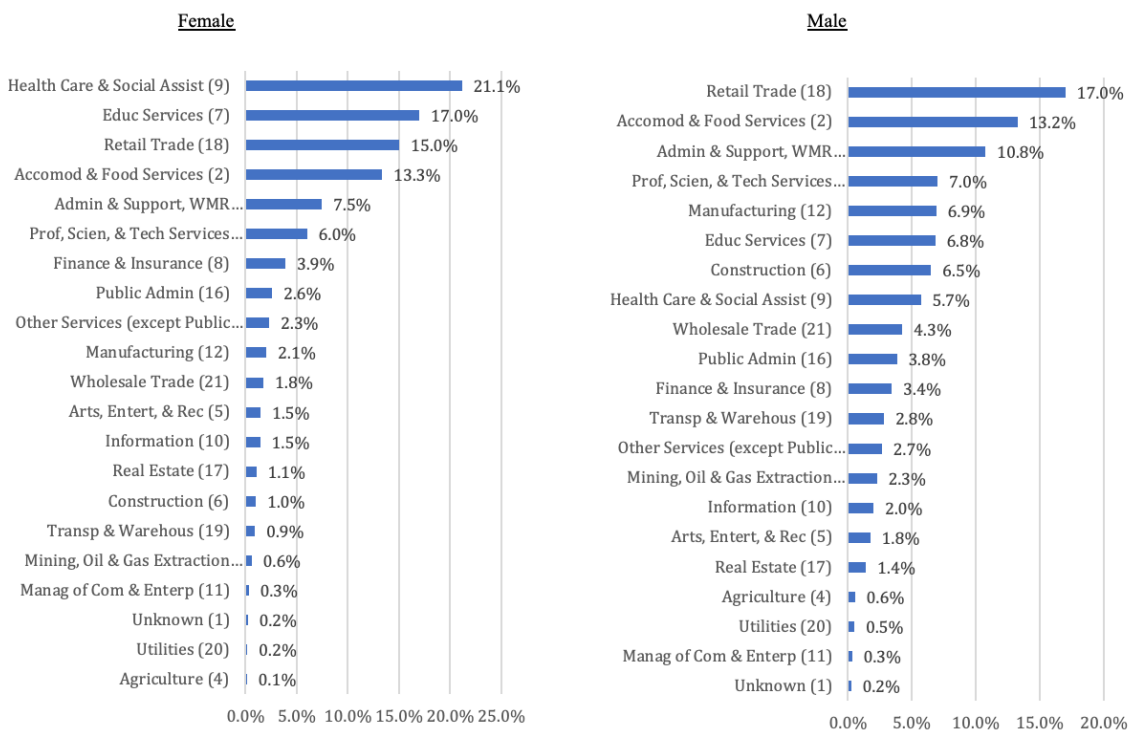
It is important to note that, in addition to educational attainment, a person's major field of study also afforded them access to a greater variety of employers. For a description of average wages earned by industry, please see the Appendix.

FIGURE 11: TOP SIX TYPES OF EMPLOYERS BY INDUSTRY (NAIC) BY HIGHEST DEGREE EARNED



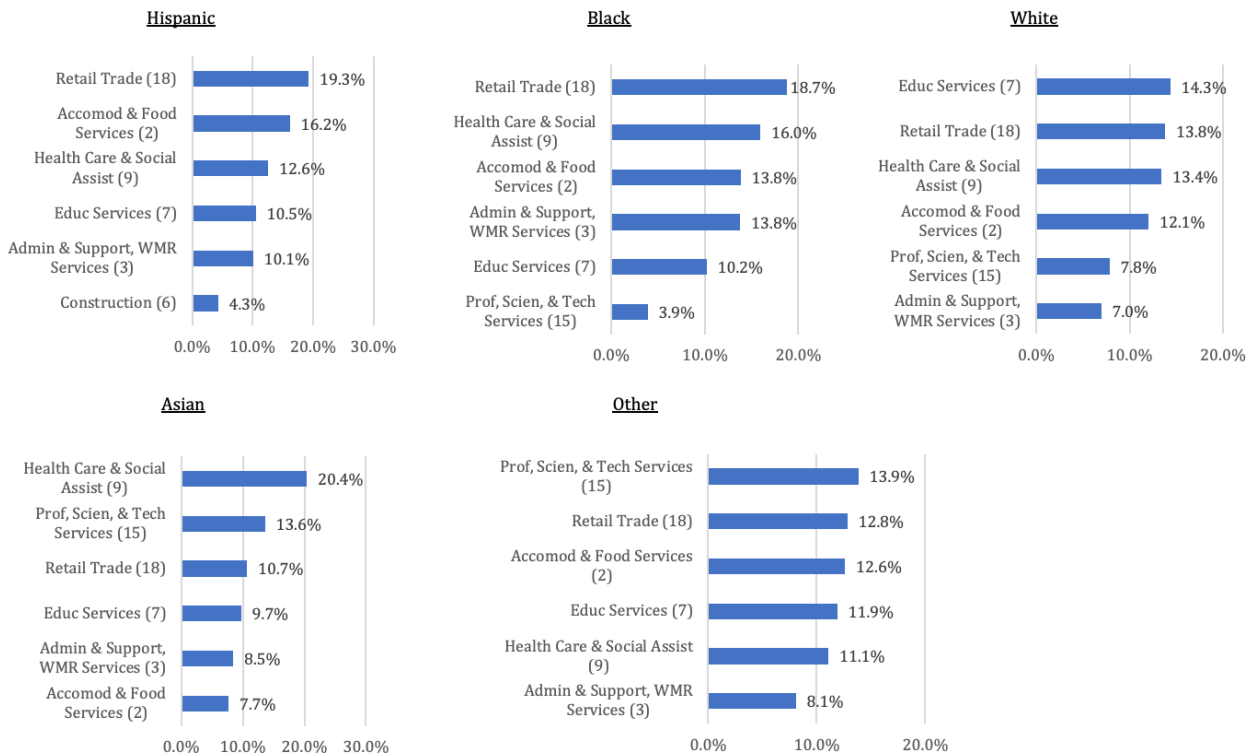
Industry by Gender. Where people found employment also varied by gender, as shown in Figure 12. Three industries employed most females: health care and social assistance (21.1 percent), education services (17 percent), and retail trade (15 percent). In contrast, five industries employed most males: retail trade (17 percent), accommodations and food services (13.2), administrative and support services (10.8 percent), professional, scientific, and technical services (7 percent), and manufacturing (6.9 percent). These figures confirmed a historic pattern of women being overrepresented in caregiving fields such as health care and education.

FIGURE 12: TYPES OF EMPLOYERS BY INDUSTRY (NAIC) BY GENDER



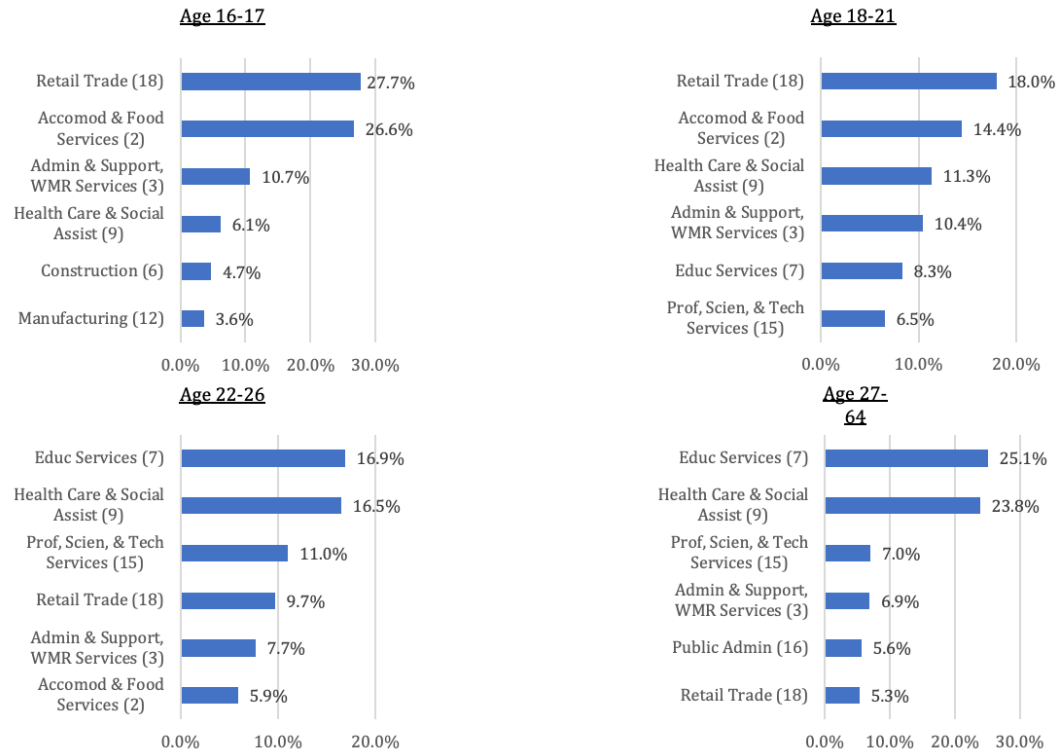
Industry by Race and Ethnicity. Where people found employment also varied by race, as shown in Figure 13. People who identified as Hispanic, Black, or White found employment in similar industries. Most Hispanics were employed in retail trade (19.3 percent), accommodation and food services sectors (16.2 percent), health care and social assistance (12.6 percent), and education services (10.5 percent). Most Blacks were employed in retail trade (18.7 percent), accommodation and food services (13.8 percent), health care and social assistance (16.0 percent), and administrative and support services (13.8 percent). While most Whites were employed in retail trade (13.8 percent), accommodation and food services sectors (12.1 percent), health care and social assistance (13.4 percent), and education services (14.3 percent). Their common sectors were retail trade, accommodations and food services, and health care.

People who identified as Asian or another race or more than one race (i.e., Other) had somewhat different employment patterns. Most Asians found employment in health care and social assistance (20.4 percent), professional, scientific, and technical services (13.6 percent), retail trade (10.7 percent) and education services (9.7 percent). While people who identified as another race or more than one race were employed in professional, scientific, and technical services (13.9 percent), retail trade (12.8 percent), accommodations and food services (12.6 percent) and education services (11.9 percent). Professional, scientific, and technical services set this group apart from Hispanics, Blacks, and Whites.

FIGURE 13: TOP SIX TYPES OF EMPLOYERS BY INDUSTRY (NAIC) BY RACIAL AND ETHNIC GROUP

Industry by Age. Where people found employment also varied by age group, as shown in Figure 22. Two industries employed a majority of the youngest age quartile (ages 16 to 17): retail trade (27.7 percent) and accommodations and food services (26.6 percent). While four industries employed the second youngest age quartile (ages 18 to 21): retail trade (18 percent); accommodations and food services (14.4 percent); health care and social assistance (11.3 percent); and administrative and support services (10.4 percent).

Older adults were more likely to find employment in fields that required advanced degrees. A majority of the third age quartile (ages 22 to 26) were employed in education services (16.9 percent), health care and social assistance (16.5 percent), professional, scientific, and technical services (11 percent), and retail trade (9.7 percent). While most of the oldest age quartile (ages 27 to 64) were employed in education services (25.1 percent), health care and social assistance (23.8 percent), and professional, scientific, and technical services (7 percent).

FIGURE 14: TOP SIX TYPES OF EMPLOYERS BY INDUSTRY (NAIC) BY AGE GROUP


MULTIVARIABLE REGRESSION RESULTS

Age. Wages increased by 1.2% as an individual became one year older. This suggests that older people who acquired a postsecondary degree received an increase in wages of 1.2 percent for every additional year of experience. This positive association was independent of the increased wages associated with increased education.

Gender. Females tended to earn less than males by 13.2% when all other factors (i.e., educational attainment, academic and majors) were held constant.

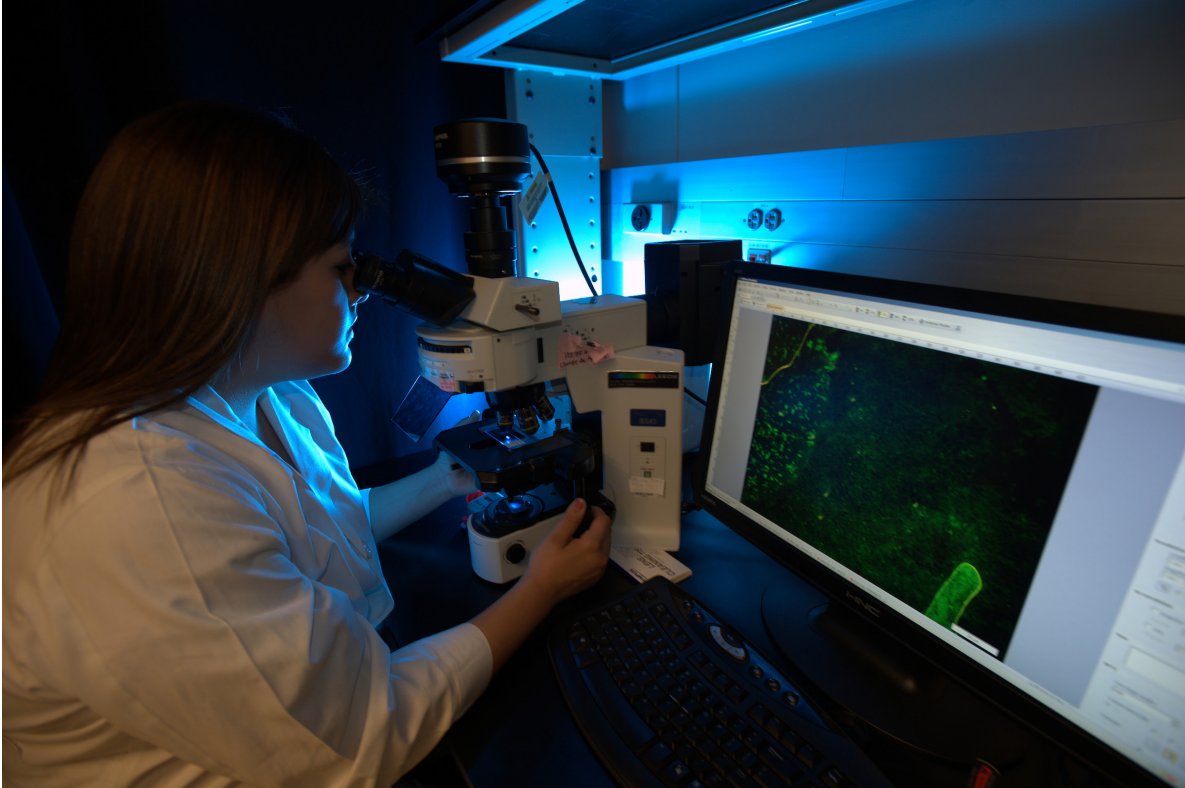
Racial Groups. Additionally, holding other factors constant, Hispanics, Blacks, Asians, and other races were predicted to earn lower wages than Whites by 7.2%, 12.9%, 5.4%, and 19.4%, respectively.

Educational Attainment. People who attained an associate, bachelor's, and graduate degree earned higher wages than certificate holders by 35.7%, 77%, and 162.9%, respectively. However, certain majors were associated with higher wages than others with higher degrees.

Majors. Certain majors were associated with above average wages. The following majors allowed the average person who attained a certificate or associate degree to earn more than the average person with a college degree that was one level higher:

- Computer science,
- Engineering,
- Engineering technologies,
- Legal studies,
- Mathematics and statistics,
- Science technologies,
- Protective services,
- Construction trades,
- Mechanic and repair technology,
- Precision production,
- Health professions, and
- Business.

Certificate holders with any one of the above majors earned more than the average associate-degree holder. Associate-degree holders with any one of these majors earned more than the average bachelor's-degree holder.



The list shortens for majors that allow the average bachelor's-degree holder to earn more than the average graduate-degree holder. These majors include the following:

- Engineering,
- Engineering technologies,
- Science technologies,
- Construction trades, and
- Health professions.

While there were 13 majors that lowered wages below the regression model's reference group (which majored in social sciences), there were only two that had the effect of lowering wages below the average person with a lesser degree (one level down). These majors were philosophy and theology.

TABLE 3: OLS RESULTS OF FACTORS AFFECTING THE LOG OF ANNUAL WAGES

	Coefficient	(Robust SE)
Age	0.0116 ***	(0.0001)
Gender (reference group: male)		
Female	-0.1319 ***	(0.0019)
Races (reference group: White)		
Hispanic	-0.0842 ***	(0.0020)
Black	-0.1619 ***	(0.0029)
Asian	-0.0613 ***	(0.0039)
Other races	-0.2309 ***	(0.0063)
Educational Attainment (reference group: certificate)		
AA	0.3222 ***	(0.0037)
BA	0.6066 ***	(0.0036)
GR	1.0310 ***	(0.0041)
Academic Major (reference group: social sciences)		
Agriculture Sciences (1)	0.1337 ***	(0.0091)
Natural Resources (3)	0.0055	(0.0146)
Architecture (4)	0.1145 ***	(0.0126)
Ethnic, Cultural, & Gender Studies (5)	-0.2035 ***	(0.0315)
Communications (9)	-0.0303 ***	(0.0071)
Communications Tech (10)	-0.1924 ***	(0.0276)
Computer Sciences (11)	0.3987 ***	(0.0076)
Culinary Services (12)	-0.1047 ***	(0.0108)
Education (13)	0.2176 ***	(0.0064)
Engineering (14)	0.7230 ***	(0.0065)
Engineering Technologies (15)	0.5668 ***	(0.0074)
Foreign Languages (16)	-0.0766 ***	(0.0128)
Consumer Sciences (19)	0.0116	(0.0093)
Legal Studies (22)	0.3553 ***	(0.0105)
English (23)	-0.0672 ***	(0.0085)
Liberal Arts (24)	0.127 ***	(0.0068)
Library Sciences (25)	0.0666 ***	(0.0123)
Biology (26)	-0.1774 ***	(0.0078)
Mathematics and Statistics (27)	0.3245 ***	(0.0110)
Multi/Interdisciplinary Studies (30)	0.2819 ***	(0.0059)
Parks & Recreation (31)	-0.0159 ***	(0.0077)
Philosophy (38)	-0.4835 ***	(0.0263)
Theology (39)	-0.6393 ***	(0.0285)
Physical Sciences (40)	0.2304 ***	(0.0122)
Science Technologies (41)	1.0184 ***	(0.0132)
Psychology (42)	-0.0739 ***	(0.0072)
Protective Services (43)	0.3668 ***	(0.0069)
Public Administration (44)	0.0423 ***	(0.0092)
Construction Trades (46)	0.5736 ***	(0.0204)
Mechanic and Repair Tech (47)	0.3596 ***	(0.0097)
Precision Production (48)	0.3806 ***	(0.0136)
Transportation (49)	-0.0125	(0.0362)
Visual & Performing Arts (50)	-0.2596 ***	(0.0079)
Health Professions (51)	0.6102 ***	(0.0057)
Business (52)	0.3854 ***	(0.0055)
History (54)	-0.1229 ***	(0.0103)
Other	0.1298 ***	(0.0079)
Intercept	9.3033 ***	(0.0077)
R2	0.1465	
Obs.	1,352,960	

REFERENCES

AIR. (2021). Launch My Career. American Institute for Research. Retrieved from <https://www.air.org/project/launch-my-career>.

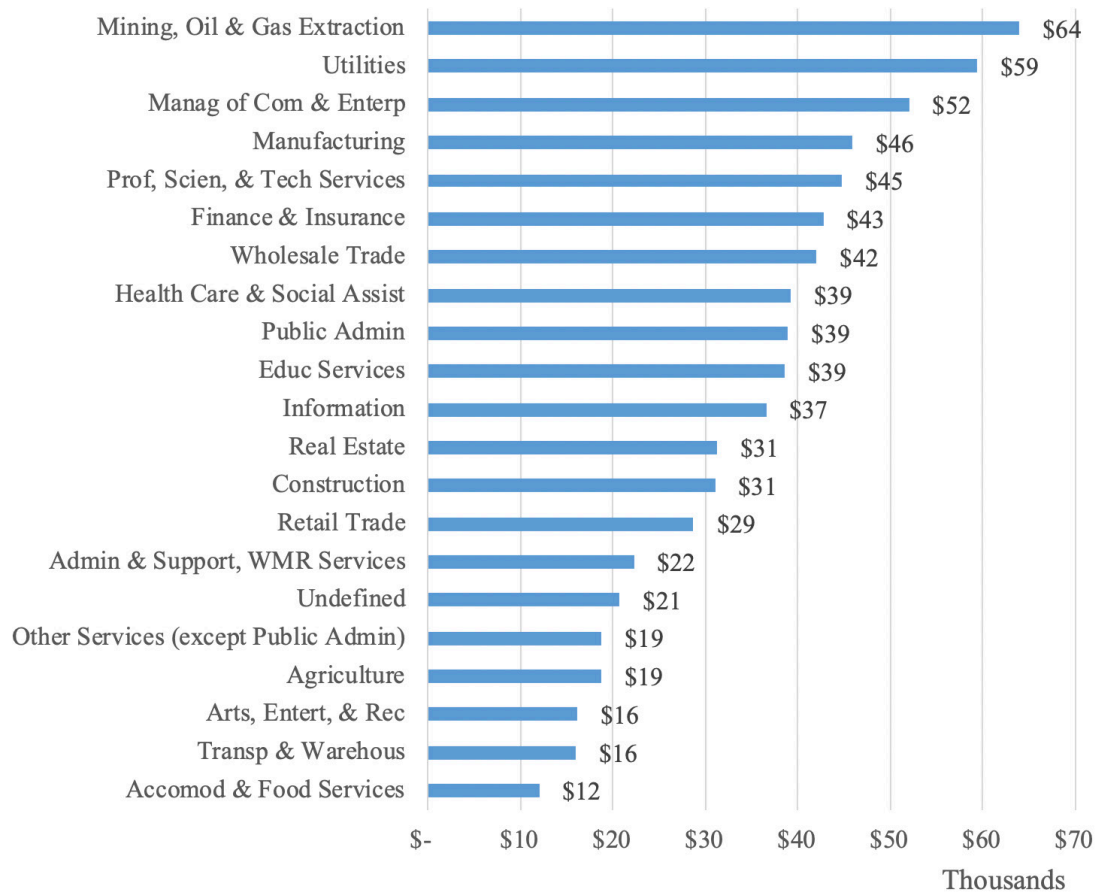
CEW. (2020). A First Try at ROI: Ranking 4,500 Colleges. Georgetown University Center on Education and the Workforce. Retrieved from <https://cew.georgetown.edu/cew-reports/collegeroi/>

USDE. (2021). The College Navigator. The U.S. Department of Education. National Center for Education Statistics. Retrieved from <https://nces.ed.gov/collegenavigator/>



APPENDIX

FIGURE 15: AVERAGE ANNUAL WAGES BY INDUSTRY



EDUCATION PAYS, BUT IT PAYS MORE FOR SOME THAN OTHERS

A CORRELATIONAL STUDY OF EDUCATIONAL ATTAINMENT, INDUSTRY, & EARNINGS

By Dr. Michael U. Villarreal
and Dr. Han Bum Lee

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