EXAMINING THE BENEFITS OF EDUCATION IN NEW JERSEY

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SDS
New Jersey Statewide Data System

Abstract

This report utilizes data from the New Jersey Statewide Data System along with the National Student Clearinghouse extract, AlumniFinder data, and, when available, data from the National Center for Education Statistics, the New Jersey Division of Taxation, and the Federal Inland Revenue Service to demonstrate that higher levels of education have a positive return on investment to the individual, the state, and society. Specifically, the report examines the costs and benefits of pursuing and attaining postsecondary education from public institutions of higher education in New Jersey. The findings demonstrate that higher education helps individuals and families achieve upward social and economic mobility and results in higher tax revenues for state and federal governments.

Executive Summary

Building upon an earlier report on the benefits of education, this report uses updated methodology and data from the New Jersey Statewide Data System (NJSDS) supplemented by external data to demonstrate that higher levels of education have a positive return on investment to the individual, the state, and society. Specifically, researchers from the John J. Heldrich Center for Workforce Development at Rutgers, The State University of New Jersey examined the costs and benefits of pursuing and attaining postsecondary education from public institutions of higher education in New Jersey. The findings in this report reiterate those of the previous report that higher education not only helps individuals and families achieve upward social and economic mobility but also results in higher tax revenues for state and federal governments.

Researchers used descriptive statistics and regression analysis to highlight differences in earning outcomes by educational level. Researchers supplemented state longitudinal administrative data from NJSDS with the time-limited National Student Clearinghouse extract and AlumniFinder data, and, when available, data from the National Center for Education Statistics, the New Jersey Division of Taxation, and the Federal Inland Revenue Service. The research draws from the 2013–14 academic year graduates from New Jersey high schools and postsecondary institutions, tracks their earnings eight years after degree completion, and makes projections of their future earnings. Unless noted, all calculations were inflated to reflect 2022 dollars. Key findings from this research are organized around the following seven metrics to capture the benefits of education to individuals, industries, and government.

1. **Earnings by Educational Award Level.** Fuzzy median earnings[1] progressively increased with higher levels of educational attainment — from high school diplomas to professional doctorate degrees. The annualized median earning in 2022 was $43,944 for high school degree holders and $147,322 for professional doctorate degree holders.

2. **Distribution of Earnings within Levels of Education.** There is considerable variability in earnings across educational levels. Most professional doctorate holders (68%) earned more than $100,000 annually as of 2022, in contrast to only 2% of high school graduates earning above $100,000.

3. **Projected Earnings Growth Over Time.** The projected earnings indicate that a higher educational level can result in higher annual earnings later in one's career (for example, in 20 years). Twenty years after graduation, professional doctoral degree holders are projected to earn up to $287,015 compared to $75,813 for high school degree holders.

4. **Earnings Premium Relative to the Cost of Education.** The financial benefit of postsecondary education remains positive even after adjusting for educational costs and lost wages due to the decision to continue attending school.

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[1] The fuzzy median wage is obtained by taking the average of the 45th and 55th percentiles of observation to avoid any risk of data disclosure typically associated with the traditional median (50th percentile). All references to median wage in this report refer to the fuzzy median wage.

5. **Earnings by Type of Industry.** Among individuals who earned a bachelor's degree in 2013–14, those working in the information sector in 2022 reported the highest median earnings.

6. **Distribution of Earnings by College Major.** Graduates with bachelor's degrees in engineering in 2013–14 had the highest median earnings two and eight years after graduation.

7. **Earnings and Tax Payments by Educational Award Level.** Projections up to 30 years after graduation for both federal and state income tax contributions from 2015 to 2044 show that total taxes mostly increase with higher educational attainment, mirroring the income brackets of these graduates. High school degree holders have a projected total state tax of $34,478, while professional doctoral degree holders have a projected tax of $264,084.

Although this study captures the earnings of the 2013–14 graduates, persistent data limitations prevented researchers from examining the full extent of the benefits of education. Table 1 summarizes the limitations of using data from NJSDS, the National Student Clearinghouse, AlumniFinder, and the Integrated Postsecondary Education Data System.

Table 1: Data Limitations

Data Sources		Data Gaps
NJSDS	New Jersey Department of Education (NJDOE)	▸ Does not identify 2013–14 high school degree holders who earned postsecondary degrees outside of New Jersey. ▸ Does not identify 2013–14 postsecondary degree holders who obtained another degree from a postsecondary institution in another state after their initial degree. ▸ Does not include the self-employed or people who work for the federal government. ▸ Does not have information on non-credit training and non-degree credential program completers.
	Office of the Secretary of Higher Education (OSHE)	
	New Jersey Department of Labor and Workforce Development (NJDOL)	
External	National Student Clearinghouse	▸ Extract used in this analysis does not include information about completion (e.g., degree earned). ▸ Extract used in this analysis is time-limited and does not include postsecondary outcomes beyond 16 months after graduating high school.
	AlumniFinder	▸ Limited reliability of educational attainment level because of inaccurate or missing data.
	Integrated Postsecondary Education Data System	▸ No detailed information on the cost of education beyond a bachelor's degree.

Notwithstanding these data limitations, this study shows that external data sources like the National Student Clearinghouse and AlumniFinder can help researchers better estimate the level of educational attainment and, as such, the benefits of education. The lack and limited reliability of completion data to track degrees attained out of state is a limitation for even the external data sources used in this study. For example, the National Student Clearinghouse extract shared by NJDOE and used at the time of this analysis does not include information on degree attainment for the high school cohort, including degree type

and graduation date.[2] As such, Heldrich Center researchers had limited ability to identify New Jersey high school graduates who obtained degrees outside of New Jersey beyond their high school degree and when it was earned. However, this challenge was mitigated by supplementing the National Student Clearinghouse extracts with AlumniFinder data, which have information on educational attainment, although the data have limited reliability. These and other limitations will be discussed in detail later in this report. As this work continues to develop, it is important to consider alternative data sources and methods to reduce limitations. Table 2 summarizes the key takeaways by research question.

Table 2: Key Takeaways by Research Question

Research Question	Key Takeaway
1. To what extent is an individual's level of education in New Jersey related to economic benefits?	▶ Individuals with higher levels of education have higher individual economic benefits measured in terms of wages.
2. To what extent is an individual's level of education in New Jersey related to economic benefits to the state?	▶ New Jersey receives greater economic benefits (in terms of income tax dollars) from individuals with higher levels of education.

Introduction

While public discourse frequently questions the value of higher education (Brink, 2022; Lederman, 2022; Parker, 2019), evidence affirms the many benefits of higher levels of education, including increased earnings, enhanced employability, upward social mobility, and greater access to healthcare and retirement plans (Ma & Pender, 2023). These advantages extend beyond individual gains to broader societal well-being and economic vitality. Individuals with higher education levels are more likely to participate in civic activities, therefore enhancing democratic engagement and community development (Ma & Pender, 2023). Furthermore, they provide better opportunities for families, contributing to a cycle of prosperity that benefits future generations (Ma & Pender, 2023). Research also indicates that higher education correlates with lower crime rates, amplifying the social benefits (Batabyal, 2023; Bernard, 2024). Additionally, higher education among the population also benefits the economy with increased tax revenues, lower unemployment rates, and fewer expenditures on social services and incarceration (Ma & Pender, 2023; Abel & Deitz, 2019; Bernard, 2024). All these collective benefits highlight the indispensable role of higher education in society.

Based on these benefits, as well as the growing demand for a college-educated workforce[3] (New Jersey Business & Industry Association, 2022), New Jersey has undertaken numerous policies and measures to increase the number of postsecondary graduates in its workforce. One such measure is the 65 by 25 Initiative, launched in 2017, which aims for 65% of New Jersey residents between the ages of 25 and 64 to obtain a postsecondary degree by 2025 (OSHE, 2019). With the current attainment rate at 58.9%, the state demonstrates significant progress toward this goal (Lumina Foundation, 2022) and surpasses the national average.[4]

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[2] Although National Student Clearinghouse provides these columns in the full file, researchers did not have access to the full file during the analysis. The advantages of obtaining the full file from the National Student Clearinghouse is discussed later in this report.

[3] By 2031, 72% of all jobs in the United States will require postsecondary education and/or training (Georgetown University Center on Education and the Workforce, 2022).

[4] The national postsecondary educational attainment rate is 54.3% (Lumina Foundation, 2022).

This report examines the benefits of pursuing postsecondary education for New Jersey residents. It seeks to document the short- and long-term outcomes of education for New Jersey residents to determine whether the benefits outweigh the costs to both the individual student and the state.

The following questions serve as a guide for this analysis:

1. To what extent is an individual's level of education in New Jersey related to individual economic benefits?
2. To what extent is an individual's level of education in New Jersey related to economic benefits to the state?

This analysis focused on students completing their education in the 2013–14 academic year at either a New Jersey public institution of higher education (2013 fall graduates and 2014 spring graduates) or completing high school in a New Jersey public school (2014 graduating cohort). The 2013–14 academic year was used because it allows researchers sufficient time to examine workforce outcomes seven years after graduation.

Data Sources

Researchers used NJSDS data, including Unemployment Insurance (UI) wages and employer records from NJDOL, graduate files from NJDOE, and completions and enrollment information from OSHE. NJSDS data were supplemented with the time-limited National Student Clearinghouse extract and AlumniFinder data and, when available, data from the National Center for Education Statistics, the New Jersey Division of Taxation, and the Federal Inland Revenue Service. The limitations of these data are detailed in the data limitations section of this report.

Population

The high school degree holder cohort was identified by removing all high school graduates of the 2014 cohort who obtained a degree from a New Jersey postsecondary institution or any postsecondary institution to the extent possible with the available data. Researchers achieved this by linking NJDOE's graduate files to enrollment and completion data files from OSHE, the time-limited National Student Clearinghouse extract, and AlumniFinder data. In 2014, the high school graduating cohort numbered 86,922 students, 31% of whom did not enroll in a postsecondary institution in New Jersey. Only 8% of these 86,922 students did not have records in either the National Student Clearinghouse extracts or AlumniFinder.

The postsecondary degree cohort was defined by removing graduates in the 2013–14 cohort in OSHE data who obtained another degree from a New Jersey postsecondary institution after their initial degree was awarded in 2013–14. One analytical limitation of this approach is that students might have obtained degrees outside of New Jersey or even online apart from their initial awarded degree in 2013–14, which researchers cannot observe. The award levels for postsecondary degree awardees were defined using the OSHE completion records variable "award type."

To allow for comparisons to high school completers (who are age-censored and are typically between the ages of 17 and 23 in this analysis), undergraduate credentials were examined for completers who were age 25 or younger, and graduate credentials were examined for completers who were age 35 or younger. This should allow for comparable time in the workforce after graduation across educational levels.

Methodology

Researchers used descriptive statistics and linear time-series projections to demonstrate differences in outcomes by educational level. The details of the methodology are included in the appendix.

Findings

Overall, researchers found that individuals with higher levels of education have higher individual economic benefits measured in terms of wages, and New Jersey receives greater economic benefits (in terms of income tax dollars) from them.

The findings of the report are organized around the following seven themes:

▶ Earnings by educational award level,

▶ Distribution of earnings within levels of education,

▶ Projected earnings growth over time,

▶ Earnings premium relative to the costs of education,

▶ Earnings by type of industry,

▶ Distribution of earnings by college major, and

▶ Earnings and tax payments by educational award level.

Earnings by Educational Award Level

Among those graduating with postsecondary education degrees in New Jersey in the 2013–14 academic year, 48%, 33%, and 17% held associate, bachelor's, and graduate degrees, respectively (see Figure 1).

This analysis found that earnings were higher for those with higher levels of educational attainment:

Median wages mostly increased with education:

▶ Those with higher educational levels mostly earned more. For example, among those awarded a degree in 2013–14, those awarded a bachelor's degree had a median earning of $74,096 in 2022 compared with the median earnings of $43,944 for those with a high school diploma (Figure 2).

▶ The median earnings for bachelor's degree holders were about 1.6 times (68%) higher than that of high school graduates; academic doctoral degree holders earned at least 2.4 times (141%) more than those with high school degrees (Figure 2).

▶ Less than two-year degree holders appear to have a slightly higher median wage of $64,435 in 2022 compared to associate degree holders, who had a median wage of $59,786 in the same year. This slightly higher wage could be due to the concentration of higher-wage earners in the less-than-two-year degree category, with most working in healthcare, public administration, and government. This is further discussed in the data limitations section of this report.

Highest earners:

▶ Professional practice doctoral degree graduates reported the highest median wage of $147,332 in 2022 (Figure 2).

Figure 1: Percentage of Postsecondary Awards Conferred in 2013–14 Academic Year

Less than Two-Year Degree
2%

| Associate Degree 33% | Bachelor's Degree 48% | Graduate Degree 17% |
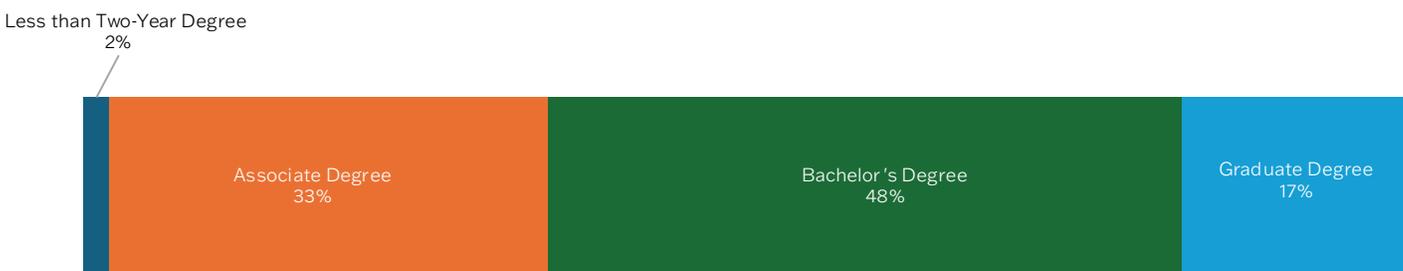
Source: New Jersey Statewide Data System

Figure 2: Annualized Median Wages of 2013–14 New Jersey Graduates by Educational Award Level, Adjusted to 2022 Dollars
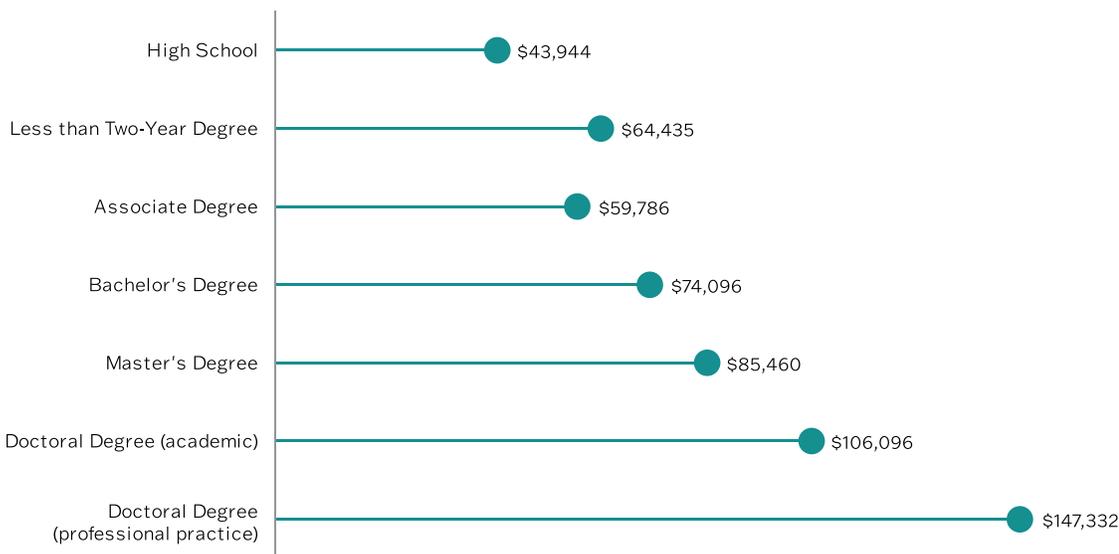
Award Level	Wage
High School	$43,944
Less than Two-Year Degree	$64,435
Associate Degree	$59,786
Bachelor's Degree	$74,096
Master's Degree	$85,460
Doctoral Degree (academic)	$106,096
Doctoral Degree (professional practice)	$147,332

Sources: New Jersey Statewide Data System, National Student Clearinghouse records, and AlumniFinder records

Distribution of Earnings within Levels of Education

In line with other studies (Sell, 2022), this analysis found that graduates with higher education credentials earned more, with median earnings mostly rising alongside educational attainment.

Earnings distribution eight years post-graduation:

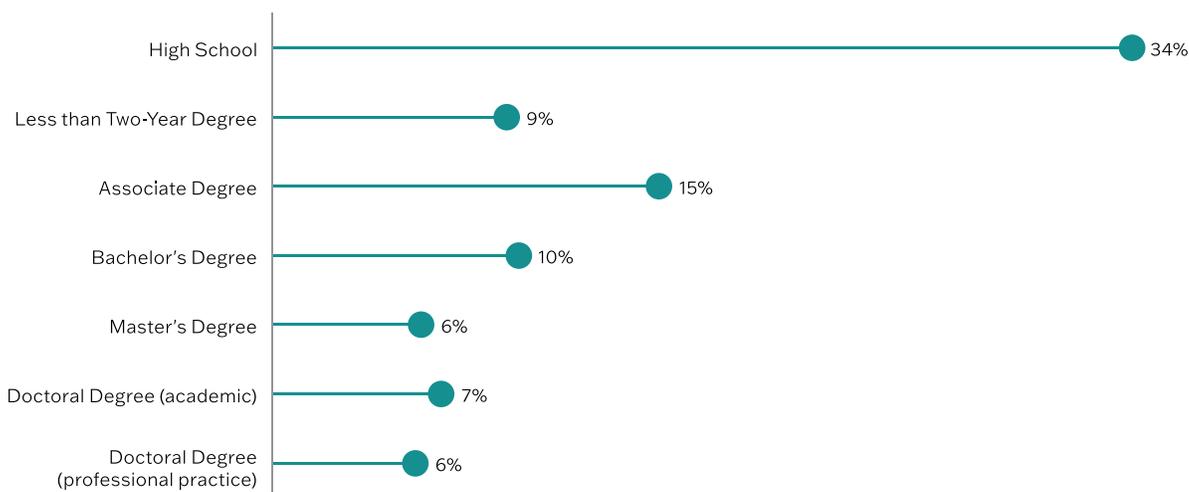▸ Eight years post-graduation, 34% of high school graduates in New Jersey **earned less than $20,000 annually**, compared with 15% and 10% of associate and bachelor's degree holders, respectively. Only 6% of professional doctorate recipients earned less than $20,000 in 2022 (see Figure 3).

▸ Of those with a high school diploma, associate degree, and bachelor's degree, 2%, 10%, and 23%, respectively, earned **more than $100,000 annually**, compared with 68% of individuals with professional doctorate degrees (see Figure 4).

Earnings below the full-time minimum wage:

▸ A higher percentage of individuals with lower educational attainment earned below the full-time minimum wage in New Jersey compared with those with higher educational attainment levels. For example, 46% of high school graduates earned less than the full-time minimum wage, compared with 13% of those with bachelor's degrees (see Figure 5).

Overall, higher educational attainment is correlated with higher earnings (see Figure 6).

Figure 3: Percentage of 2013–14 Graduates with Less than $20,000 in Annual Earnings by Educational Award Level in 2022

High School	34%
Less than Two-Year Degree	9%
Associate Degree	15%
Bachelor's Degree	10%
Master's Degree	6%
Doctoral Degree (academic)	7%
Doctoral Degree (professional practice)	6%

Sources: New Jersey Statewide Data System, National Student Clearinghouse records, and AlumniFinder records

Figure 4: Percentage of 2013–14 Graduates with More than $100,000 in Annual Earnings by Educational Award Level in 2022
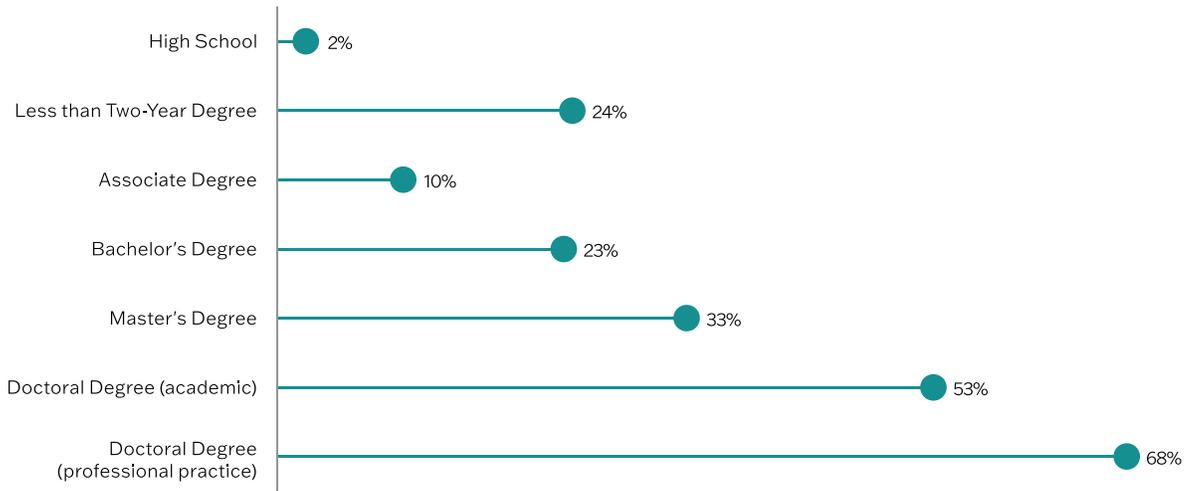
Educational Award Level	Percentage
High School	2%
Less than Two-Year Degree	24%
Associate Degree	10%
Bachelor's Degree	23%
Master's Degree	33%
Doctoral Degree (academic)	53%
Doctoral Degree (professional practice)	68%

Sources: New Jersey Statewide Data System, National Student Clearinghouse records, and AlumniFinder records

Figure 5: Percentage of 2013–14 Graduates with Earnings Less than Full-Time Minimum Wage in New Jersey by Educational Award Level in 2022
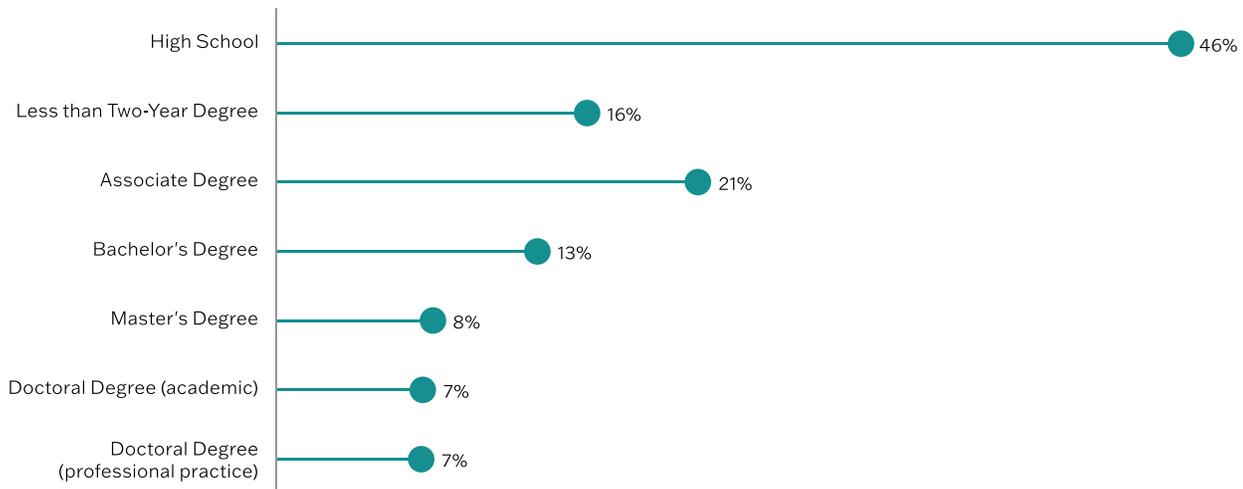
Educational Award Level	Percentage
High School	46%
Less than Two-Year Degree	16%
Associate Degree	21%
Bachelor's Degree	13%
Master's Degree	8%
Doctoral Degree (academic)	7%
Doctoral Degree (professional practice)	7%

Sources: New Jersey Statewide Data System, National Student Clearinghouse records, and AlumniFinder records

Figure 6: Distribution of Annual Earnings Bands for 2013–14 Graduates by Educational Award Level in 2022

	Up to $20,000	$20,000 to $39,999	$40,000 to $59,999	$60,000 to $79,999	$80,000 to $99,999	$100,000 and Above
High School	34%	33%	20%	8%	3%	2%
Less than Two-Year Degree	9%	22%	23%	15%	7%	24%
Associate Degree	15%	21%	25%	18%	10%	10%
Bachelor's Degree	10%	11%	19%	23%	14%	23%
Master's Degree	6%	5%	11%	25%	20%	33%
Doctoral Degree (academic)	7%		9%		17%	53%
Doctoral Degree (professional practice)	6%		7%		12%	68%

Note: Seven percent of professional practice doctoral degree graduates and 14% of academic doctoral degree graduates were suppressed from the estimates because they did not meet NJSDS reporting data standards (see NJSDS acceptable use guidelines). Percentages may not sum to 100% due to rounding.

Sources: New Jersey Statewide Data System, National Student Clearinghouse records, and AlumniFinder records

Projected Earnings Growth Over Time
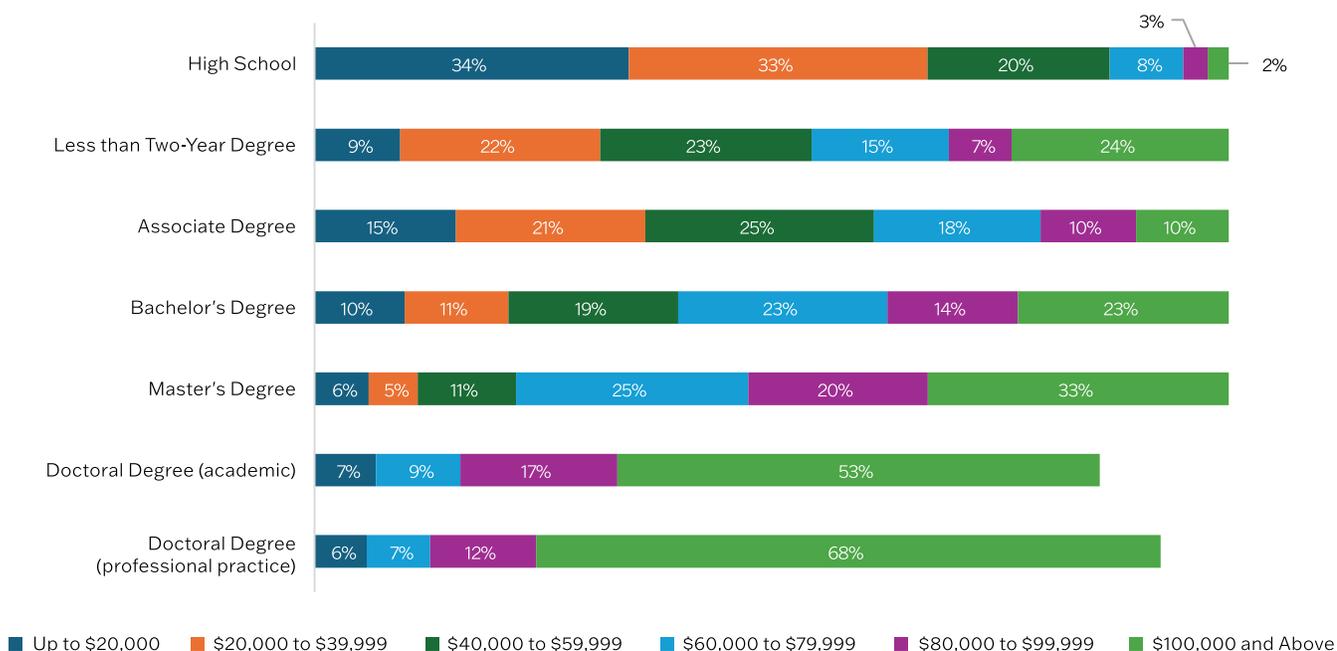
The research team developed wage growth projections using the baseline wage data available from NJSDS from 2015 to 2022 for the 2013–14 graduates via a linear time-series regression model.

Projected wages 20 years post-graduation:

▸ Twenty years after graduation (in 2034), high school graduates have the lowest projected median wage of $75,813. This projected amount is lower than the $120,702 projected as the median wage for bachelor's degree holders and the $287,015 projected as the median wage for professional practice doctoral degree holders.

▸ Bachelor's degree holders seem to have a higher projected median wage ($120,702) than master's degree holders ($107,851) 20 years after graduation. This could be explained by the projection model, which uses the historical growth rate in wages to make projections. For example, the median earnings for bachelor's degree holders were $44,965 in 2015 and $74,096 in 2022. This is about a 65% increase in the median wage over eight years. However, for master's degree holders, the median wage was $70,309 in 2015 and $85,460 in 2022. This is about a 26% increase in the median wage over eight years. This implies that the median wage of bachelor's degree holders has steadily increased at a higher rate over time compared to master's degree holders. In addition, due to the projection model's reliance on historical data, projections could have a wider margin of error as further wages are projected into the future. Notably, projections 10 years after graduation show that master's degree holders have a slightly higher projected median wage of $88,562 compared with $82,334 for bachelor's degree holders.

Highest projected earners:

▸ Professional practice doctoral degree graduates are projected to have the highest median wage ($287,015) after 20 years, followed by academic doctoral degree holders ($144,545) (see Table 3).

Table 3: Projected Full-Time Wages for 2014–15 Graduates by Degree Level and Years from Graduation

	1 Year After Graduation	10 Years After Graduation	20 Years After Graduation
High School	$27,256	$49,776	$75,813
Less than Two-Year Degree	$51,995	$65,566	$83,033
Associate Degree	$34,920	$66,790	$102,006
Bachelor's Degree	$44,965	$82,334	$120,702
Master's Degree	$70,309	$88,562	$107,851
Doctoral Degree (academic)	$82,112	$114,811	$144,545
Doctoral Degree (professional practice)	$63,118	$171,784	$287,015

Sources: New Jersey Statewide Data System, National Student Clearinghouse records, and AlumniFinder records

Earnings Premium Relative to the Price of Education

This section estimates the total economic value of additional education minus the cost of education. The cost of education includes the actual cost of obtaining a degree as well as the opportunity costs (foregone wages or the wages one would have earned by not pursuing further education).

Higher levels of education mostly yield higher lifetime earnings:

▸ The overall cost of attending college, considering foregone wages and the total cost of attendance, ranged from $94,582 for associate degree holders to $229,981 for bachelor's degree holders and up to $712,759 for doctoral degree holders (see Table 4).

▸ The projected lifetime earnings (defined as 40 years of work post-graduation — 2015 to 2054) for high school graduates is about $3.08 million, which is lower than other degree levels attained. Associate degree holders have projected lifetime earnings of about $4.1 million, and the projected lifetime earnings of bachelor's degree recipients are estimated to be about $4.9 million. Doctoral degree holders are projected to earn over $5.8 million over their lifetime (see Table 4).

▸ All higher education levels yield net positive lifetime earnings when the total cost of education is considered. After accounting for costs, associate degree recipients have projected lifetime earnings of about $4.05 million, about $971,480 higher than the projected lifetime earnings of high school degree holders. Professional practice doctoral degree holders have the highest projected lifetime earnings of almost $11 million after accounting for costs (see Figure 7).

The inflection point (break-even years) to justify higher educational spending is between 8 to 12 years for all educational attainment levels:

▸ On average, it takes around 8 to 12 years to earn enough money to justify the cost of additional postsecondary education.

▸ Academic doctoral degree holders have the highest break-even years at 12 years (see Figure 7).

Table 4: Estimated Foregone Wages to Attend College, the Total Cost of Education, Lifetime Wages, Net Wages After Accounting for Total Costs, and Years Until Graduate's Net Income is Higher than High School Graduates for 2013–14 Public New Jersey Graduates, 2015 to 2054

	Costs			Income		
	Foregone Wages	Total Cost of Attendance	Total Cost (Foregone Wages + Total Cost of Attendance)	Lifetime Earnings	Net Lifetime Earnings Above High School Degree	Break-Even Year
High School				$3,084,605		
Associate Degree	$56,083	$38,499	$94,582	$4,150,671	$971,484	8
Bachelor's Degree	$119,258	$110,723	$229,981	$4,904,815	$1,590,229	9
Master's Degree	$197,832	$166,085	$363,917	$4,352,621	$904,099	9
Doctoral Degree (academic)	$380,589	$332,170	$712,759	$5,841,267	$2,043,903	12
Doctoral Degree (professional practice)	$380,589	$332,170	$712,759	$11,711,063	$7,913,699	10

Sources: New Jersey Statewide Data System, National Student Clearinghouse records, AlumniFinder records, and Integrated Postsecondary Education Data System

Figure 7: Projected Lifetime Earnings Minus Cost of Education for 2013–14 New Jersey Graduates
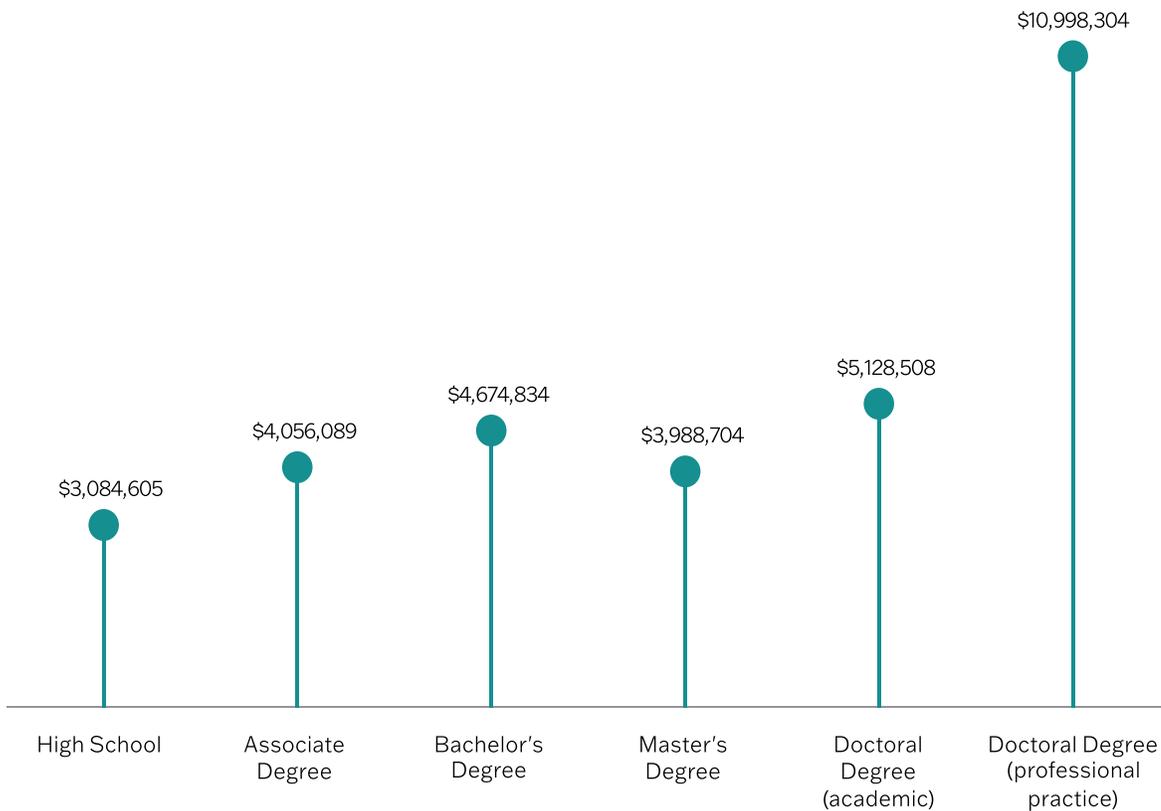
Sources: New Jersey Statewide Data System, National Student Clearinghouse records, AlumniFinder records, and Integrated Postsecondary Education Data System

Earnings by Type of Industry

This analysis found that wages differ by industry type using North American Industry Classification System codes.

The median wages in 2022 for 2013–14 bachelor's degree holders varied by industry type:
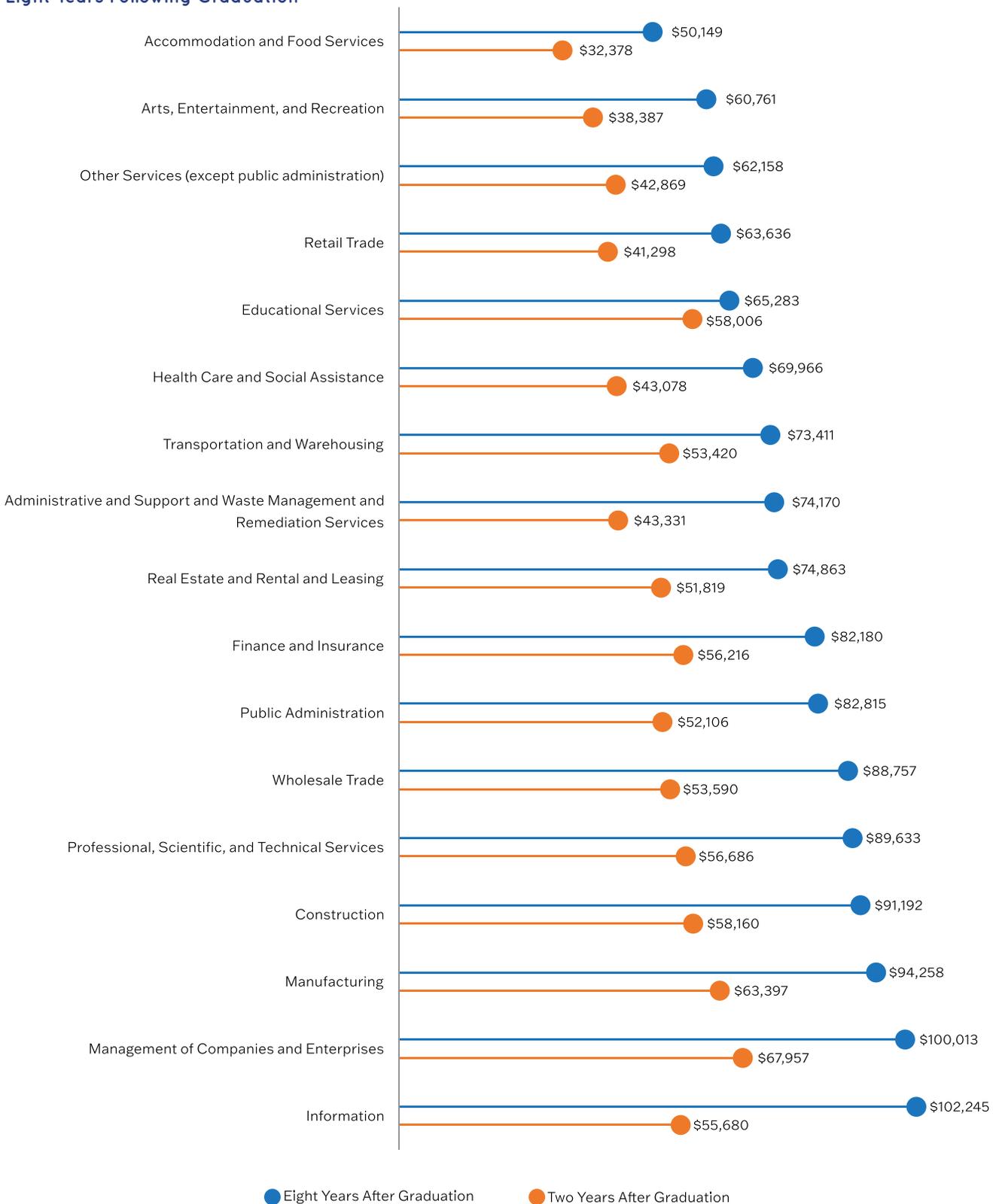
▶ As shown in Figure 8, the industries with the highest median wage for bachelor's degree holders in 2022 were information ($102,245), management of companies and enterprises ($100,013), manufacturing ($94,258), and construction ($91,192).

▶ As illustrated in Figure 8, the industries with the lowest median wages for bachelor's degree holders were accommodation and food services ($50,149); arts, entertainment, and recreation ($60,761); other services (except public administration) ($62,158); and retail trade ($63,636).

The median wages of the 2013–14 bachelor's degree holders increased across all industries between 2016 and 2022 (i.e., two years after graduation to eight years after graduation):

▶ Although median wages varied across industries, there was an increase in median wages across all industries between 2016 and 2022. For example, the median wage for the information industry increased from $55,680 in 2016 to $102,245 in 2022 (see Figure 8).

▶ Between 2016 and 2022, the information industry had the highest percentage change in median wages among bachelor's degree holders (84%). Notably, the educational services industry experienced the lowest percentage change in median earnings (13%) (see Figure 9).

Figure 8: Median Earnings of 2013–14 Bachelor's Degree Graduates in Constant 2022 Dollars by Type of Industry, Two and Eight Years Following Graduation

Industry	Two Years After Graduation	Eight Years After Graduation
Accommodation and Food Services	$32,378	$50,149
Arts, Entertainment, and Recreation	$38,387	$60,761
Other Services (except public administration)	$42,869	$62,158
Retail Trade	$41,298	$63,636
Educational Services	$58,006	$65,283
Health Care and Social Assistance	$43,078	$69,966
Transportation and Warehousing	$53,420	$73,411
Administrative and Support and Waste Management and Remediation Services	$43,331	$74,170
Real Estate and Rental and Leasing	$51,819	$74,863
Finance and Insurance	$56,216	$82,180
Public Administration	$52,106	$82,815
Wholesale Trade	$53,590	$88,757
Professional, Scientific, and Technical Services	$56,686	$89,633
Construction	$58,160	$91,192
Manufacturing	$63,397	$94,258
Management of Companies and Enterprises	$67,957	$100,013
Information	$55,680	$102,245

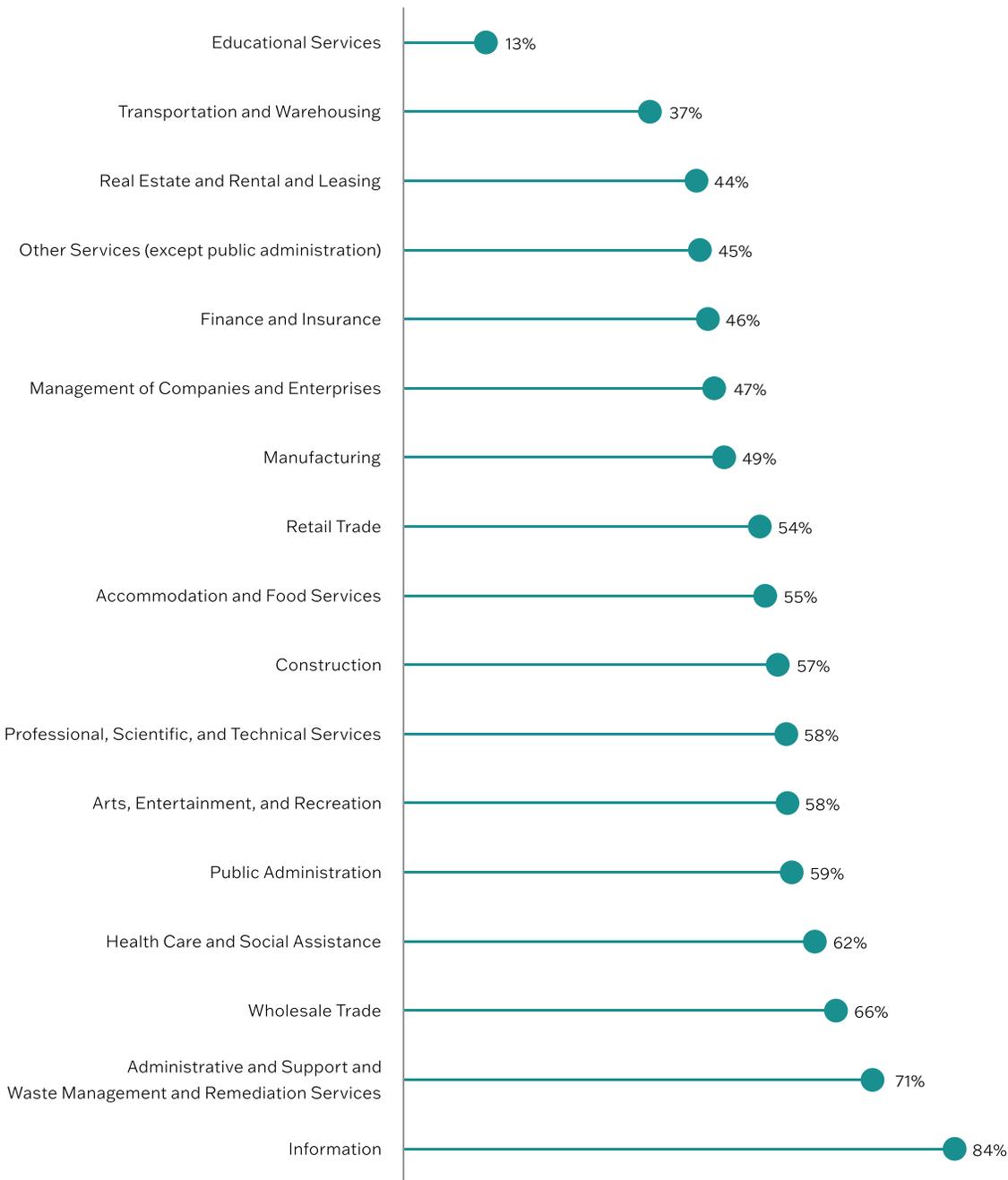● Eight Years After Graduation　● Two Years After Graduation

Note: The median wages for agriculture, forestry, fishing, and hunting, as well as the utilities industry, were suppressed from the estimates because they did not meet NJSDS reporting data standards (see NJSDS acceptable use guidelines).

Source: New Jersey Statewide Data System

Figure 9: Percentage Increase of the Median Earnings of 2013–14 Bachelor's Degree Graduates by Type of Industry, 2016 to 2022

Industry	Percentage
Educational Services	13%
Transportation and Warehousing	37%
Real Estate and Rental and Leasing	44%
Other Services (except public administration)	45%
Finance and Insurance	46%
Management of Companies and Enterprises	47%
Manufacturing	49%
Retail Trade	54%
Accommodation and Food Services	55%
Construction	57%
Professional, Scientific, and Technical Services	58%
Arts, Entertainment, and Recreation	58%
Public Administration	59%
Health Care and Social Assistance	62%
Wholesale Trade	66%
Administrative and Support and Waste Management and Remediation Services	71%
Information	84%

Note: The percentages for agriculture, forestry, fishing, hunting, and the utilities industry were suppressed from the estimates because they did not meet NJSDS reporting data standards (see NJSDS acceptable use guidelines).

Source: New Jersey Statewide Data System

Earnings by Educational Level and Major

This analysis finds that wages differ by college major using Classification of Instructional Programs codes.

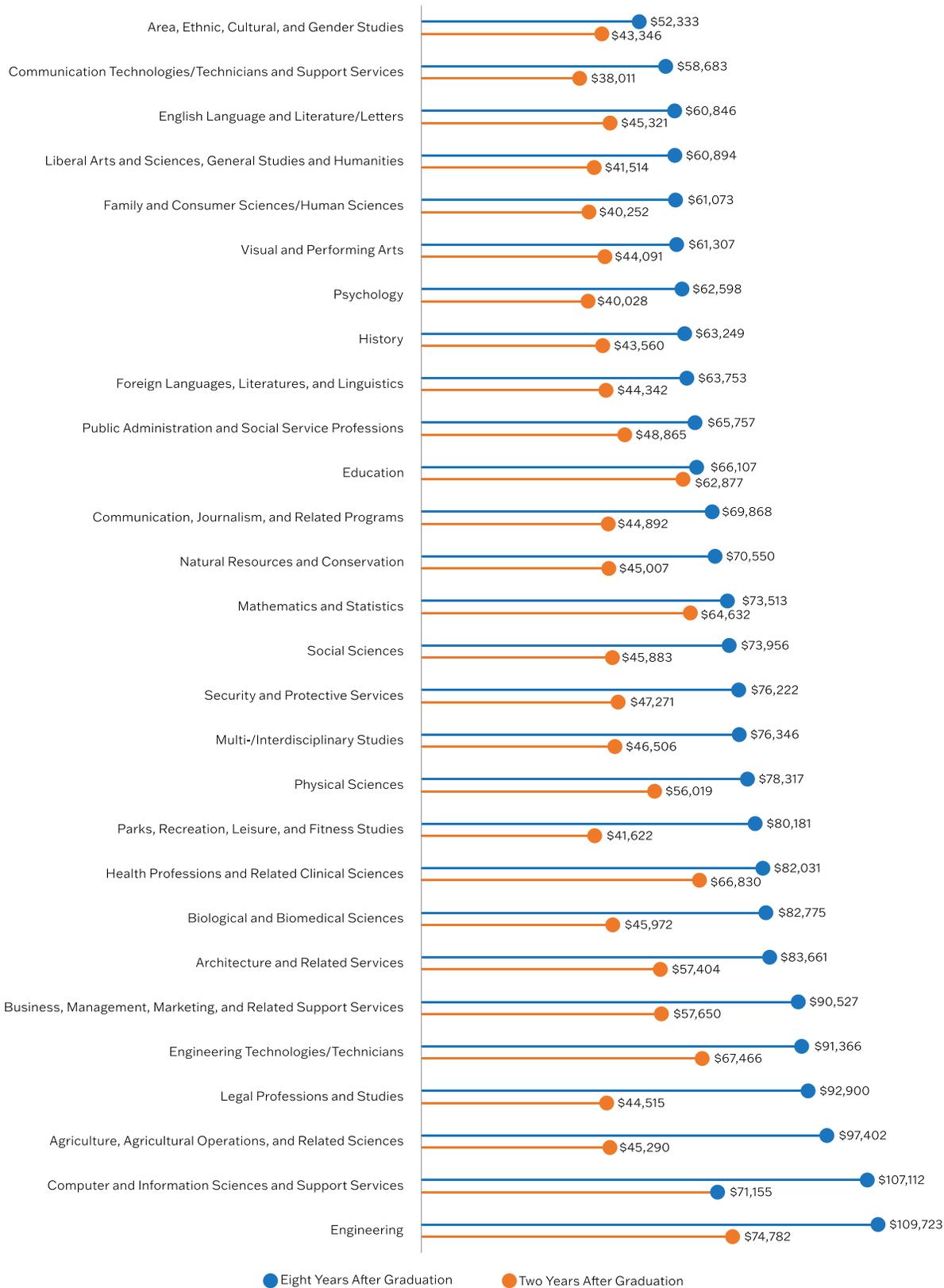**The median wages in 2022 for the 2013–14 bachelor's degree holders varied by college major:**

▸ Engineering ($109,723); computer and information sciences and support services ($107,112); agriculture, agricultural operations, and related sciences ($97,402); and legal professions and studies ($92,900) were the college majors with the highest median wages for bachelor's degree holders in 2022 (see Figure 10).

▸ As shown in Figure 10, the majors with the lowest median wages for bachelor's degree holders in 2022 were area, ethnic, cultural, and gender studies ($52,333); communication technologies/technicians and support services ($58,683); English language and literature/letters ($60,846); and liberal arts and sciences, general studies, and humanities ($60,894).

The median wages of the 2013–14 bachelor's degree holders increased across all college majors between 2016 and 2022 (i.e., two years after graduation to eight years after graduation).

▸ There was an increase in median wages across all college majors between 2016 and 2022. For example, the median wage for bachelor's degree holders with an engineering major increased from $74,782 in 2016 to $109,723 in 2022 (see Figure 10).

▸ As illustrated in Figure 11, between 2016 and 2022, bachelor's degree holders who majored in agriculture, agricultural operations, and related sciences had the highest percentage change in median wages (115%). Notably, those who majored in education experienced the lowest percentage change in median earnings (5%).

Figure 10: Comparison of Median Earnings of 2013–14 Bachelor's Degree Graduates Working Full Time by College Major in Constant 2022 Dollars, Two and Eight Years Following Graduation

Major	Eight Years After Graduation	Two Years After Graduation
Area, Ethnic, Cultural, and Gender Studies	$52,333	$43,346
Communication Technologies/Technicians and Support Services	$58,683	$38,011
English Language and Literature/Letters	$60,846	$45,321
Liberal Arts and Sciences, General Studies and Humanities	$60,894	$41,514
Family and Consumer Sciences/Human Sciences	$61,073	$40,252
Visual and Performing Arts	$61,307	$44,091
Psychology	$62,598	$40,028
History	$63,249	$43,560
Foreign Languages, Literatures, and Linguistics	$63,753	$44,342
Public Administration and Social Service Professions	$65,757	$48,865
Education	$66,107	$62,877
Communication, Journalism, and Related Programs	$69,868	$44,892
Natural Resources and Conservation	$70,550	$45,007
Mathematics and Statistics	$73,513	$64,632
Social Sciences	$73,956	$45,883
Security and Protective Services	$76,222	$47,271
Multi-/Interdisciplinary Studies	$76,346	$46,506
Physical Sciences	$78,317	$56,019
Parks, Recreation, Leisure, and Fitness Studies	$80,181	$41,622
Health Professions and Related Clinical Sciences	$82,031	$66,830
Biological and Biomedical Sciences	$82,775	$45,972
Architecture and Related Services	$83,661	$57,404
Business, Management, Marketing, and Related Support Services	$90,527	$57,650
Engineering Technologies/Technicians	$91,366	$67,466
Legal Professions and Studies	$92,900	$44,515
Agriculture, Agricultural Operations, and Related Sciences	$97,402	$45,290
Computer and Information Sciences and Support Services	$107,112	$71,155
Engineering	$109,723	$74,782

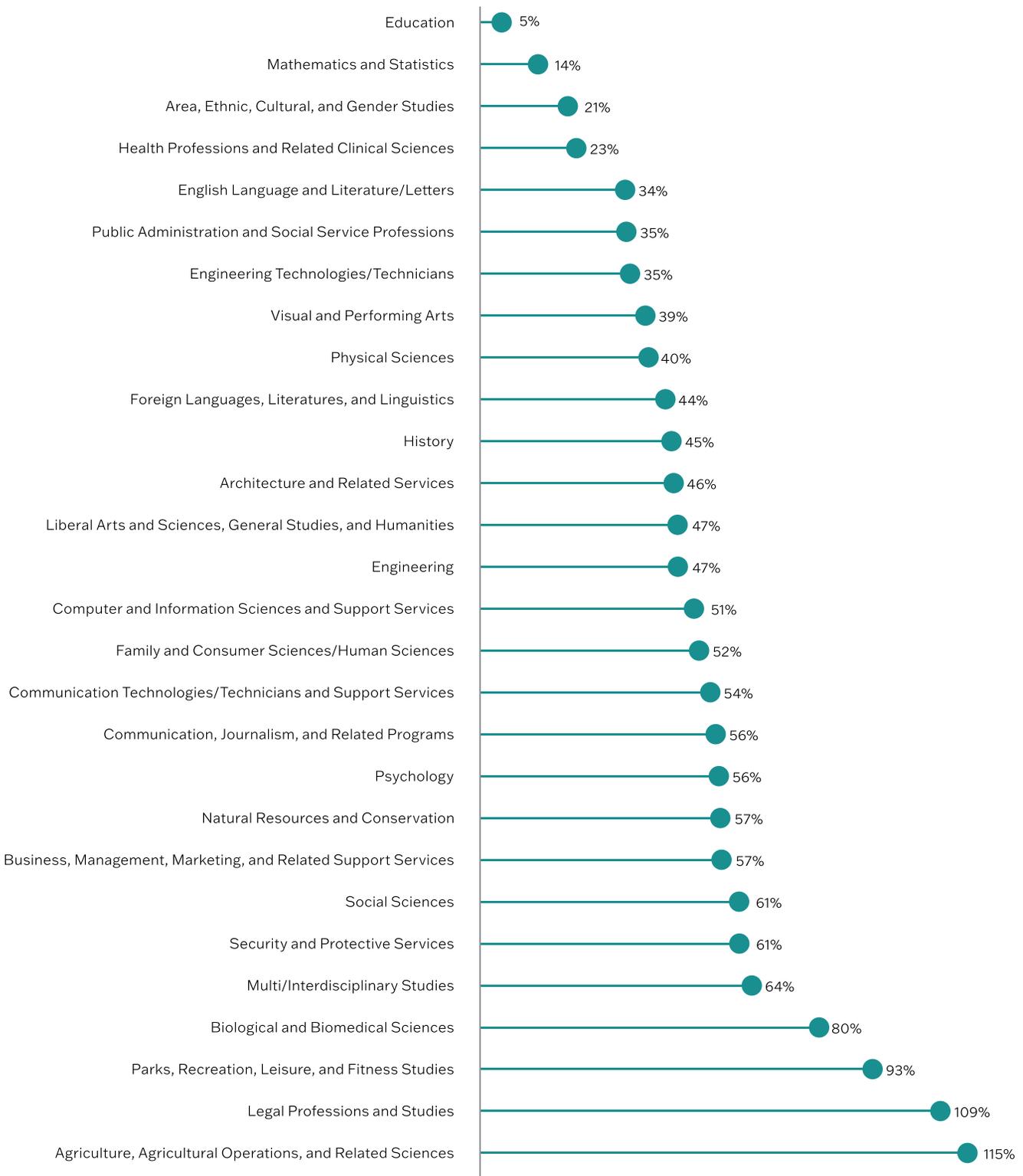● Eight Years After Graduation ● Two Years After Graduation

Note: The median wages for philosophy, religious studies, and science technologies/technicians were suppressed from the estimates because they did not meet NJSDS reporting data standards (see NJSDS acceptable use guidelines).

Source: New Jersey Statewide Data System

Figure 11: Percentage Increase of the Median Earnings of 2013–14 Bachelor's Degree Graduates by College Major, 2016 to 2022

Major	%
Education	5%
Mathematics and Statistics	14%
Area, Ethnic, Cultural, and Gender Studies	21%
Health Professions and Related Clinical Sciences	23%
English Language and Literature/Letters	34%
Public Administration and Social Service Professions	35%
Engineering Technologies/Technicians	35%
Visual and Performing Arts	39%
Physical Sciences	40%
Foreign Languages, Literatures, and Linguistics	44%
History	45%
Architecture and Related Services	46%
Liberal Arts and Sciences, General Studies, and Humanities	47%
Engineering	47%
Computer and Information Sciences and Support Services	51%
Family and Consumer Sciences/Human Sciences	52%
Communication Technologies/Technicians and Support Services	54%
Communication, Journalism, and Related Programs	56%
Psychology	56%
Natural Resources and Conservation	57%
Business, Management, Marketing, and Related Support Services	57%
Social Sciences	61%
Security and Protective Services	61%
Multi/Interdisciplinary Studies	64%
Biological and Biomedical Sciences	80%
Parks, Recreation, Leisure, and Fitness Studies	93%
Legal Professions and Studies	109%
Agriculture, Agricultural Operations, and Related Sciences	115%

Note: The median wages for philosophy, religious studies, and science technologies/technicians were suppressed from the estimates because they did not meet NJSDS reporting data standards (see NJSDS acceptable use guidelines).

Source: New Jersey Statewide Data System

Earnings and Tax Payments by Educational Award Level

This section estimates the total economic value of additional education to society in terms of federal and state income taxes.[5]

Federal and state income tax payments are higher for graduates with higher levels of education:

▶ The estimated state and federal taxes in 2022 are highest for doctoral degree holders compared to individuals with lower educational levels (see Figure 12).

▶ Estimated state taxes in 2022 for high school degree holders were $439 and $1,482 for bachelor's degree holders. Similarly, in 2022, the federal tax for high school degree holders was $2,197, while the estimated federal tax was $5,187 for bachelor's degree holders (see Figure 12). Therefore, bachelor's degree holders contribute about twice as many taxes to the state as high school degree holders.

▶ Professional practice doctoral degree holders pay the most taxes (both federal and state taxes). The estimated state tax for professional practice doctoral degree holders in 2022 was $4,420, which is about 3 times the estimated tax for bachelor's degree holders and about 10 times the estimated tax for high school degree holders (see Figure 12).

▶ Federal tax collection was higher than state tax collection in 2022 for each award type due to higher tax rates for each income level.

Projected taxes (taxes on 30 years of projected wages — 2015 to 2044) are mostly higher for graduates with higher levels of education:

▶ As seen in Figure 13, total estimated state taxes collected over 30 years are highest for professional practice doctoral degree holders ($264,084), which is about three times higher than the state taxes for bachelor's degree holders ($82,459) and about eight times higher than the state taxes for high school degree holders ($34,478).

▶ Similarly, as shown in Figure 14, the total estimated federal taxes collected over 30 years is highest for professional practice doctoral degree holders ($1,097,038) and lowest for high school degree holders ($137,692).

Figure 12: New Jersey Graduates' Estimated Taxes by Award Level in Constant 2022 Dollars in 2022
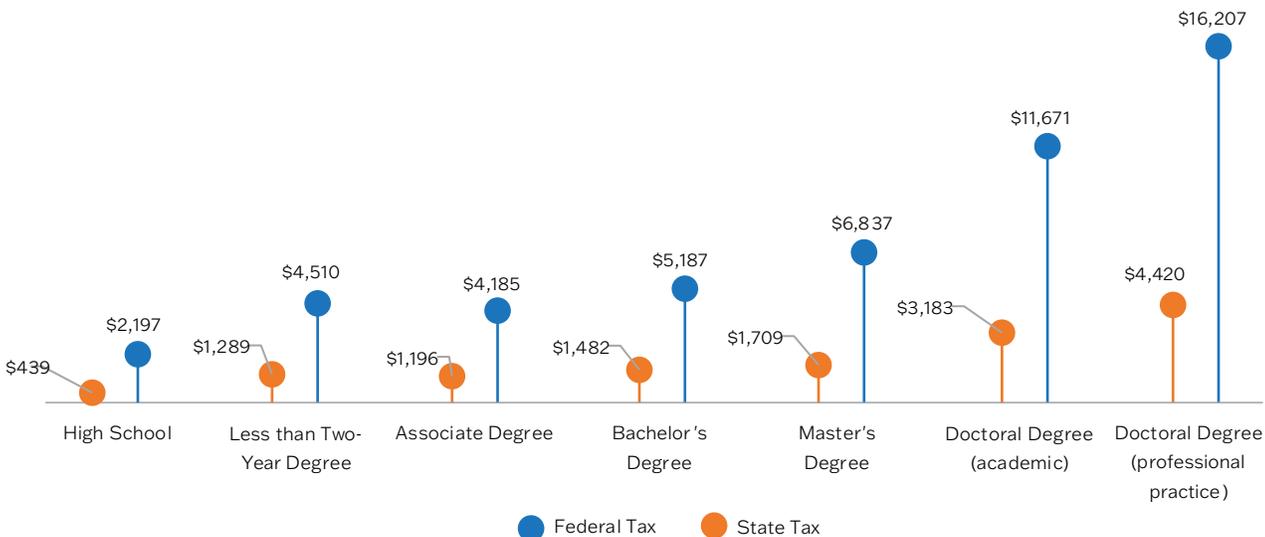
Note: The taxes displayed in the figure represent the estimated taxes for the median earner for each level of education in 2022.

Sources: New Jersey Statewide Data System, National Student Clearinghouse records, AlumniFinder records, Federal Inland Revenue Service records, and New Jersey Department of the Treasury records

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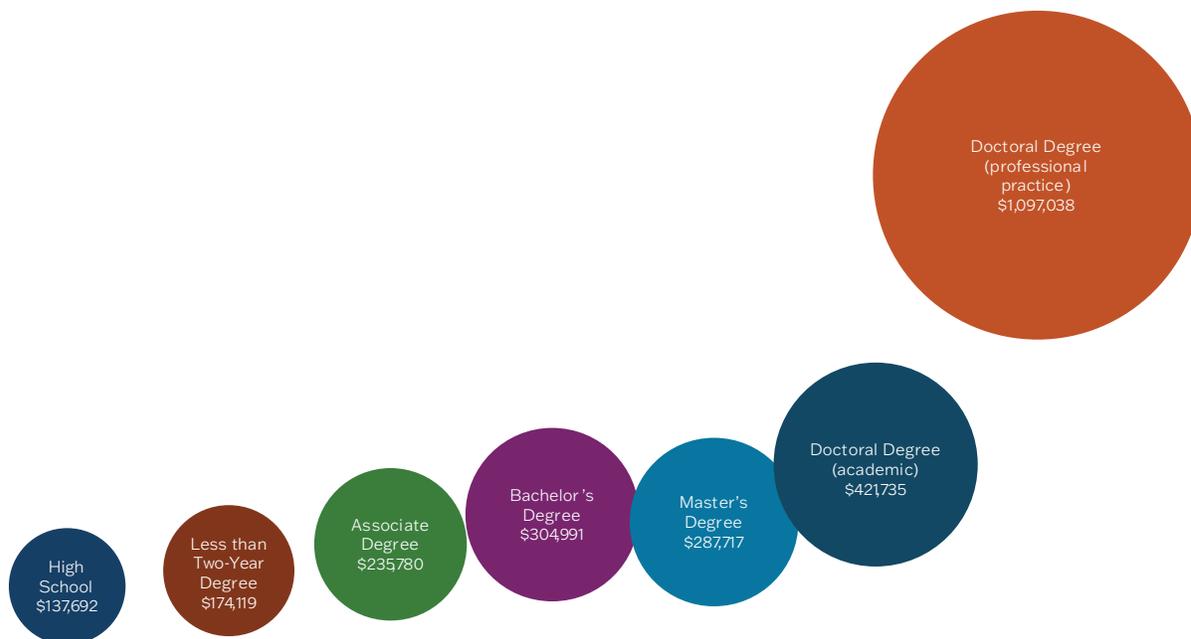[5] Taxes in this report refer to income taxes. See the appendix for details on tax calculation.

Figure 13: Total State Taxes Paid by 2013–14 New Jersey Graduates from 2015 to 2044 by Award Level

Doctoral Degree (professional practice) $264,084

Doctoral Degree (academic) $114,345

Bachelor's Degree $82,459

Master's Degree $76,548

Associate Degree $62,901

Less than Two-Year Degree $46,109

High School $34,478
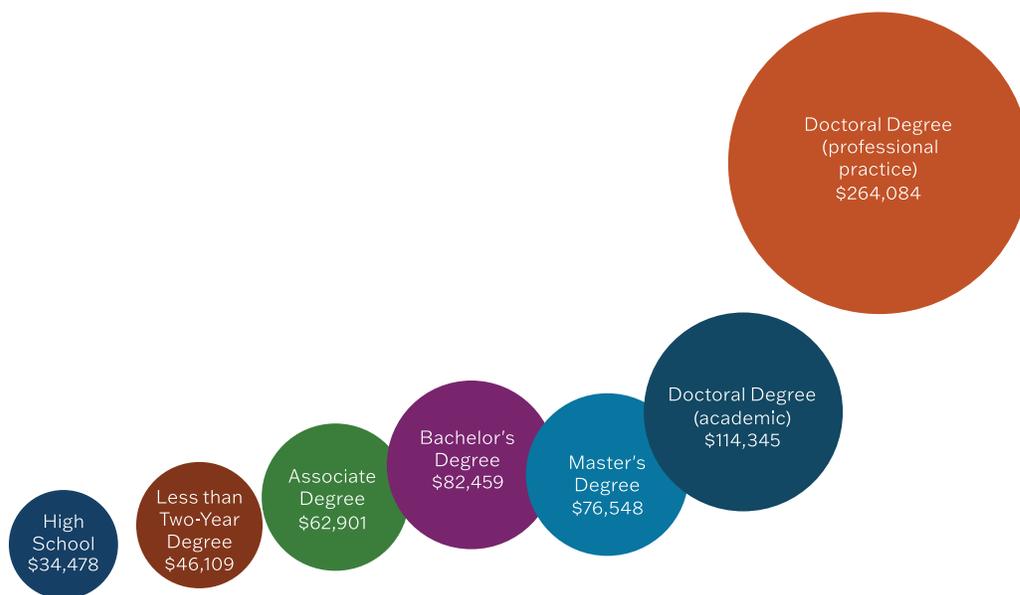
Note: The taxes displayed in the figure represent the total projected state taxes from 2015 to 2044 for the median earner for each level of education.

Sources: New Jersey Statewide Data System, National Student Clearinghouse records, AlumniFinder records, and New Jersey Department of the Treasury records

Figure 14: Total Federal Taxes Paid by 2013–14 New Jersey Graduates from 2015 to 2044 by Award Level

Doctoral Degree (professional practice) $1,097,038

Doctoral Degree (academic) $421,735

Bachelor's Degree $304,991

Master's Degree $287,717

Associate Degree $235,780

Less than Two-Year Degree $174,119

High School $137,692

Note: The taxes displayed in the figure represent the total projected federal taxes from 2015 to 2044 for the median earner for each level of education.

Sources: New Jersey Statewide Data System, National Student Clearinghouse records, AlumniFinder records, and Federal Inland Revenue Service records

Data Limitations and Recommendations

It is essential to acknowledge several data limitations encountered during this study and to propose some recommendations.

Missing Data, Bias Reduction, and Confidentiality. The UI wage records only include data from employers in New Jersey participating in the UI program. They do not include wages on employment of New Jersey residents who work outside of the state, work for the federal government, are self-employed, or otherwise do not contribute to the UI program. The match rate is between 70% and 80% for higher education graduates, depending on the institution sector.

A full-time equivalent annual wage was calculated to reduce the impact of the missing cases on the analysis and minimize bias. Annual wages were computed by summing four quarters of wages (i.e., annual wage 2022 = Quarter1 wage + Quarter2 wage + Quarter3 wage + Quarter4 wage). Those students with missing data for a quarter were included and assigned a zero wage for that quarter. The full-time equivalent annual wage was estimated by including students with annual wages at or above the full-time minimum wage. The full-time minimum wage was calculated by multiplying New Jersey's minimum wage for that year by 2,080 hours, which is defined as 40 hours a week for 52 weeks. Annualizing wages using this method has been shown to reduce the bias introduced by these missing populations (Simone, 2022). **To better improve the accuracy of future reports in this series, it is recommended that the definition of full-time minimum wage be discussed among key stakeholders.** This discussion should emphasize whether 35 hours or 40 hours a week should be considered as full-time work hours.

In addition, to comply with data confidentiality and user agreements associated with NJSDS, researchers redacted counts and subsequent outcomes for groups with fewer than 10 records.

Defining the High School and Postsecondary Degree Cohort. The high school degree holder cohort was achieved by linking NJDOE graduate files to enrollment and completions data files from OSHE and then to the time-limited National Student Clearinghouse extract and AlumniFinder data. This was done to ensure that the high school cohort contained only those who did not obtain any other degree besides their high school degree awarded in 2014. A Heldrich Center study on outmigration in New Jersey found that around 51,000 (or 26%) New Jersey high school graduates in 2014 or 2015 pursued postsecondary enrollment in another state (Maruska et al., 2024) and, therefore, they would be wrongly included in the high school cohort population for this report if NJSDS data were solely used for this study. External data sources like the National Student Clearinghouse and AlumniFinder can be used to help researchers better identify high school degree holders; however, these sources are not without challenges.

The National Student Clearinghouse extract shared by NJDOE, which could capture those who obtained a postsecondary degree out-of-state, does not include information on degree attainment for the high school cohort, including degree type and graduation date. Although the National Student Clearinghouse provides these columns in the full file, researchers did not have access to the full file during the analysis. In addition, the extract is limited to postsecondary enrollment 16 months after high school graduation and does not include all enrollment up until 2022. Given these limitations, researchers assumed that those who had records in the National Student Clearinghouse could potentially have obtained other degrees beyond their high school degree and were, therefore, not included in this analysis.

Similarly, AlumniFinder data rely on web-scraping tools to pull publicly available data from the Internet, including degrees listed on LinkedIn profiles. This raises questions about the reliability of these data, as sites like LinkedIn do not capture all college graduates or their educational attainment.

NJSDS should explore acquiring the full file from the National Student Clearinghouse to better enhance understanding of the benefits of education in New Jersey. The full file, available for additional fees, is not subject to the limitations of the extract files used in this analysis.

In addition, data on **non-credit awards and non-degree credentials and other forms of workforce education and training offerings would further help researchers define the high school degree-only population and help researchers access the benefits of these non-credit or non-degree credentials. To the degree of data availability, the benefits of non-credit awards and non-degree credentials would be analyzed in the next report in this series examining the benefits of education.**

The postsecondary degree cohort was defined by removing graduates in the 2013–14 cohort in OSHE data who obtained another degree from a New Jersey postsecondary institution after their initial awarded degree in 2013–14. One analytical limitation of this approach is that students might have obtained degrees outside of New Jersey or online apart from their initial awarded degree in 2013–14, which researchers cannot observe. One method of addressing this limitation is multi-state collaboration. Several states, led by Kentucky, are working to share deidentified data securely to better understand what happens to their postsecondary graduates who move out of state. This work has culminated in the Multi-State Postsecondary Report, an effort around which New Jersey has recently partnered to expand and produce similar analyses. **As this multi-state collaboration and many more collaborations continue to develop, it is important to consider alternate data sources to reduce limitations.**

Cost of Education for a Graduate Degree (Master's and Doctoral Degrees). The Integrated Postsecondary Education Data System has information on the cost of attendance (in-state tuition, fees, room, board, and supplies) for New Jersey public two-year, in-district or public four-year institutions. However, this information is limited for graduate education; information about the cost of attendance is only on tuition and fees. In addition, there is no difference in cost for master's students and doctoral students separately. Lacking such data, in the present report, researchers used the cost for a bachelor's degree and multiplied it by 1.5 to obtain the cost of a master's degree and by 3 to obtain the cost of a doctoral degree. **Specific information on the cost of education in New Jersey across all award levels would enhance this report.**

Definition of Award Levels and Less-than-Two-Year Degree Award Level. The award levels for postsecondary awardees were defined using the OSHE completion records variable "award type." However, the category coded "100," which refers to less-than-two-year degrees, includes a wide range of degrees and certificates, including less-than-one-year certificates/diplomas and at least less-than-one-year but less-than-two-year certificates/diplomas. This analysis found that this award category captured mostly higher-wage earners (24% of less-than-two-year degrees earned over $100,000 compared with high school degree holders [2%] or associate degree holders [10%] (see Figure 4). Researchers found that the less-than-two-year degree holders mostly majored in criminal justice/political science, licensed practical/vocational nurse training, legal assistant studies, and paralegal studies. Most of these degree holders were working in the healthcare and social assistance industry and public administration and government. **It is recommended that OSHE discuss what degrees should qualify as less-than-two-year degrees in relation to associate degree holders and as pertains to the discussion of the benefits of education.**

Apart from the above limitation with defining the less-than-two-year degree category, another reason researchers could have higher estimates for the less-than two-years degree holder is that they cannot observe if those students went on to obtain other degrees outside of New Jersey or even degrees online. It could also be that these certificate earners earned degrees outside New Jersey and returned to the state to get reskilled or upskilled with certificate programs. Although data limitations prevent researchers from examining these hypotheses, these considerations could affect other levels of degree earners, yet are not reflected in the results for these other levels.

Conclusion

This report on the benefits of education presents results from a high-level descriptive analysis and time-series, regression-based projections for eight years of data on the New Jersey labor market (2015 to 2022) to demonstrate that higher levels of education have a positive return on investment to the individual, the state, and society. It builds upon a previous report by updating the methodology for defining the sample, annualizing wages, and making projections. It also updates the data used in the previous report to include the most recent wage data and shows how complementing NJSDS data with external data sources like the National Student Clearinghouse and AlumniFinder can help researchers better address research questions.

The Heldrich Center supplemented NJSDS data with National Student Clearinghouse extracts and AlumniFinder data and, when available, data from the National Center for Education Statistics, the New Jersey Division of Taxation, and the Federal Inland Revenue Service.

Descriptive statistics and regression analysis yielded the following key findings, which are similar to the findings in the first report in this series:

▶ **Earnings by Educational Award Level.** Median earnings mostly progressively increased with each ascending level of educational attainment; for example, those with a bachelor's degree had median earnings of $74,096 in 2022 compared with the median earnings of $43,944 for those with a high school diploma.

▶ **Distribution of Earnings within Levels of Education.** Most professional doctorate holders (68%) earned more than $100,000 annually as of 2022, in contrast to only 2% of high school graduates who earned above $100,000.

▶ **Projected Earnings Growth Over Time.** The projected earnings indicate that higher educational levels can, in the long run (20 years later), result in annual earnings up to $287,015 for professional practice doctoral degree graduates later in their careers compared with about $75,813 for high school degree holders.

▶ **Earnings Premium Relative to the Price of Education.** The financial benefits of postsecondary education remain positive even after adjusting for educational costs and lost wages from the decision to continue attending school. On average, it takes approximately 8 to 12 years to cumulatively earn enough money to justify the cost of additional postsecondary education.

▶ **Earnings by Type of Industry.** Of those who earned a bachelor's degree in 2013–14, those working in the information sector in 2022 reported the highest median earnings.

▶ **Distribution of Earnings by College Major.** In 2022, graduates with bachelor's degrees in engineering had the highest median earnings both two and eight years after graduation.

▶ **Earnings and Tax Payments by Educational Award Level.** Estimated state income taxes for high school degree holders in 2022 were $439, while they were $1,482 for bachelor's degree holders. Total projected state income taxes collected over 30 years are highest for professional practice doctoral degree holders ($264,084), which is about three times higher than that of bachelor's degree holders ($82,459) and about eight times higher than that of high school degree holders ($34,478).

Overall, this report reiterates the postulations of the human capital theory that the labor market rewards investments that individuals make in themselves through various ways, including higher salaries (Becker, 2009). It also reiterates findings that there are variations in earnings across majors and that the labor market favors bachelor's degree holders with certain college majors, particularly those requiring technological skills and nonroutine tasks (Zhang et al., 2024). Apart from wage differentials by majors, race/ethnicity and gender are also important aspects that need to be examined. These nuances, which will be examined in the next report in this series, are important for understanding the circumstances under which educational investments would pay off and are critical for policymaking.

As this report shows, the benefits of postsecondary education outweigh the costs in about 8 to 12 years (which is estimated to be less than 30% of one's time in the workforce), highlighting postsecondary education as a worthwhile investment. Apart from individual benefits, society at large also gains from increases in educational attainment through higher wages and higher tax payments to state and federal governments. Overall, this report provides a strong argument for policies that increase access to and support postsecondary pathways. It encourages public commitment to postsecondary education, including through public subsidies that could reduce the costs to individuals and provide greater private and public benefits.

The next benefits of education study in 2025 will address some of the limitations of this study, including utilizing data from the Eligible Training Provider List to ensure non-credit training program completers are included as having education beyond high school to better explore discussions on the benefits of education. The next report will also include subgroup analyses by race/ethnicity and gender as it is important for all nuances on wage differentials to be explored.

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Appendix: Methodology

For this study, Heldrich Center researchers used high-level descriptive analysis and a linear time-series regression model to examine seven themes, which each yielded one to four data visualizations plus a brief narrative to provide context. The population, measures, and methodological notes for each theme are listed below. Unless noted, all calculations were inflation-adjusted to reflect 2022 dollars. In addition, the median wage in this analysis refers to a fuzzy median wage obtained by taking the average of the 45th and 55th percentiles of observation to avoid any risk of data disclosure typically associated with the traditional median (50th percentile).

Earnings by Educational Award Level

To examine earnings by educational award level, researchers used NJSDS data tables, including UI wage records from NJDOL, graduate files from NJDOE, and completions and enrollment information from OSHE. NJSDS data were supplemented with the time-limited National Student Clearinghouse extract and AlumniFinder data. Generally, researchers defined annual wage by summing four quarters of wage data for each year.[6] For the annualized median wage calculation for earnings by educational level, researchers retained only those whose annual wage is equal to or greater than the full-time equivalent earnings minimum wage for each year. Full-time equivalent earnings were estimated following the New Jersey higher education graduates' estimated full-time earnings and employment outcomes dashboards.[7] It involved multiplying the hourly minimum wage for the year by 40 weekly hours and 52 weeks. The minimum wage in 2022 was $13 and the minimum full-time earnings in 2022 were $27,040. Note that this is not equivalent to a living wage in New Jersey.

Distribution of Earnings within Levels of Education

This theme used data, including UI wage records from NJDOL, graduate files from NJDOE, and completions and enrollment information from OSHE. NJSDS data were supplemented with the time-limited National Student Clearinghouse extract and AlumniFinder data. To analyze wages less than $20,000 for 2022, the dataset was filtered to include only individuals with records where their annual wage was greater than zero and less than $20,000. The same method was followed for analyzing wages of $100,000 or more and for wages below the full-time minimum wage. Full-time minimum wage is defined as described above. To categorize wages within annual earnings bands, researchers defined and created the following earnings bands:

- $1 to $19,999,
- $20,000 to $39,999,
- $40,000 to $59,999,
- $60,000 to $79,999,
- $80,000 to $99,999, and
- $100,000 and above.

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[6] The 2015 annual wage is defined as the sum of quarter 1, quarter 2, quarter 3, and quarter 4 wages in 2015 for each individual in the data.

[7] See https://rutgers.app.box.com/v/HEOv2Methods.

Projected Earnings Growth Over Time

Researchers used a linear time-series regression model to project wages into the future for the projected earnings and estimated tax tables. The source data were the annual median earnings data for the sample from 2015 to 2022 as defined in the "Earnings by Educational Award Level" section of this report. The coefficients for this regression were used to forecast annual wages up to 2044 for the 2013–14 graduate cohort.

The analytical limitation of this projection is that it assumes that previous patterns of wage changes will continue linearly. It also requires a lot of historical data to correctly predict occurrences in the future correctly. Researchers have limited historical wage data (2015 to 2022) for their analytical cohort; hence, projections too far into the future would be less accurate. Thus, researchers' wage projections for 20 to 30 years after graduation could contain a wider margin of error.

Earnings Premium Relative to the Cost of Education

The data used for earnings projections and the earnings premium relative to the cost of education include UI wage records from NJDOL, graduate files from NJDOE, completions and enrollment information from OSHE, and the cost of education from the National Center for Education Statistics. When generating estimates for lifetime earnings, researchers used the annual wage projections developed from the linear time-series regression model described in the "Projected Earnings Growth Over Time" section of this report.

The total cost of attendance is the weighted average of New Jersey public two-year, in-district or public four-year, in-state tuition, fees, room, board, and supplies, as reported by the Integrated Postsecondary Education Data System for the academic years preceding and including the 2013–14 academic year.[8] This reported value excludes the reduction in costs due to grants, scholarships, assistantships, fellowships, or other non-loan student aid programs. It also excludes additional costs due to loans such as origination fees and interest.

Foregone wage is simply the wage that one would have earned had they not pursued additional education beyond a high school degree. For example, the foregone wages for bachelor's degree recipients would be the sum of the median wages for high school degree holders for four years after their graduation.[9] Earnings and costs were summed over the course of a lifetime (40 years) to present the lifetime estimates.

The inflection point (break-even) year is when lifetime earnings for other educational award levels exceed that of high school students' diplomas even when accounting for the costs of going to college. The break-even year was calculated for each level of educational attainment by examining the cumulative difference in earnings for each wage year and determining the year when the earnings up to that date, minus the higher educational costs, were more than that of high school graduates.

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[8] The specific variables used include the total price of attendance for in-district students living off campus (not with family) for two-year colleges, the total price of attendance for in-state students living off campus (not with family), and the reported full-time equivalent. Researchers generated total tuition based on enrollment for each institution and then obtained the average tuition among all institutions for each year. Finally, the total cost of attendance for those who obtained a four-year degree for the 2013–14 graduating cohort is the sum of the average price of education for 2009–10 through 2013–14. Researchers multiplied this cost by 1.5 for those who obtained a master's degree and by 3 for those who obtained a doctoral degree.

[9] For example, to get the break-even year for bachelor's degree holders, for each wage year after graduation, including projected wages, researchers subtracted the wage from that of high school degree earners. Researchers then calculated the cumulative difference in wage (cwt + wt-1) up to 40 years of wages and then determined the year when the cumulative wage exceeded the overall educational cost.

Earnings by Type of Industry

This analysis NJSDS data tables, including UI wages and employer records from NJDOL, graduate files from NJDOE, and completions and enrollment information from OSHE. NJSDS data were supplemented with the time-limited National Student Clearinghouse extract and AlumniFinder data. The North American Industry Classification System (NAICS) 2022 table was used to ascertain the different industries in which graduates work. To assign a NAICS code to an individual, researchers went through several steps:

▸ If a graduate worked for more than one employer in the same quarter, all wages for that quarter were included in the analysis. However, the graduate was assigned the federal employer identification number of the employer that they received the most wages from in the quarter.

▸ If a graduate worked for more than one employer in a wage year, they were assigned the federal employer identification number of the employer corresponding to the highest wages they received in the year.

▸ The federal employer identification number is linked to the NAICS code to determine the industry type. Employers with more than one NAICS code were assigned their modal NAICS code in the data. Only bachelor's degree graduates were included in this analysis.

Distribution of Earnings by College Major

This metric includes data from NJSDS higher education enrollment and completions, UI wages, and the Classification of Instructional Programs 2010 table. Classification of Instructional Programs codes were used to classify students into major groups at the two-digit or broader level (e.g., OSHE categories or science, humanities, health, etc.). Only bachelor's degree graduates are included.

Earnings and Tax Payments by Educational Award Level

The earnings and tax payments data visualizations were derived from NJSDS data tables, including UI wages and employer records from NJDOL, graduate files from NJDOE, and completions and enrollment information from OSHE. NJSDS data were supplemented with the time-limited National Student Clearinghouse extract and AlumniFinder data as well as data from the New Jersey Division of Taxation and the Federal Inland Revenue Service. Tax revenues were estimated by using the average tax rate compared to adjusted gross income for federal taxes and total income for state taxes. These rates reflect the average filing status (single, married, head of household), deductions taken, and special tax situations. Tax rate tables were estimated by the author using state[10] and federal[11] statistics of income to estimate the effective New Jersey state and federal tax rates (and amounts) for the income range for the graduate. The rates used are presented in Tables A-1 and A-2.

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[10] State of New Jersey Department of the Treasury, Statistics of Income, 2017 Gross Income Tax Returns. See Table B: Full year resident return summary, session on all returns.

[11] Statistics of Income - Individual Income Tax Returns Complete Report 2021 - see Table 1.2 on page 54. The average tax rate for a wage bracket = adjusted gross income less deficit divided by total income tax (amount). https://www.irs.gov/pub/irs-pdf/p1304.pdf#page=55

Table A-1: Federal Tax, 2021

$1 to Below $5,000	0%
$5,000 to Below $10,000	0%
$10,000 to Below $15,000	0%
$15,000 to Below $20,000	1%
$20,000 to Below $25,000	2%
$25,000 to Below $30,000	3%
$30,000 to Below $40,000	4%
$40,000 to Below $50,000	5%
$50,000 to Below $75,000	7%
$75,000 to Below $100,000	8%
$100,000 to Below $200,000	11%
$200,000 to Below $500,000	17%
$500,000 to Below $1,000,000	23%
$1,000,000 to Below $1,500,000	26%
$1,500,000 to Below $2,000,000	27%
$2,000,000 to Below $5,000,000	28%
$5,000,000 to Below $10,000,000	27%
$10,000,000 or More	25%

Source: Federal Inland Revenue Service - Statistics of Income - Individual Income Tax Returns Complete Report 2021

Table A-2: State Tax, 2017

$0 to Below $5,000	0%
$5,000 to Below $10,000	0%
$10,000 to Below $15,000	0%
$15,000 to Below $20,000	0%
$20,000 to Below $25,000	0%
$25,000 to Below $30,000	0%
$30,000 to Below $35,000	0%
$35,000 to Below $40,000	1%
$40,000 to Below $50,000	1%
$50,000 to Below $70,000	2%
$70,000 to Below $75,000	2%
$75,000 to Below $80,000	2%
$80,000 to Below $100,000	2%
$100,000 to Below $150,000	3%
$150,000 to Below $200,000	3%
$200,000 to Below $500,000	4%
$500,000 to Below $1,000,000	5%
$1,000,000 to Below $1,500,000	5%
$1,500,000 to Below $2,000,000	6%
$2,000,000 to Below $5,000,000	6%
$5,000,000 to Below $10,000,000	6%
At least $10,000,000	6%

Source: State of New Jersey Department of the Treasury, Statistics of Income, 2017 Gross Income Tax Returns

Acknowledgements

About the New Jersey Statewide Data System

The New Jersey Statewide Data System (NJSDS) is the State of New Jersey's centralized longitudinal data system for education and workforce data. Its mission is to safely use the state's existing administrative data for evidence-based policymaking. NJSDS creates a single place where state education, postsecondary education, employment, and workforce longitudinal data are securely stored to help stakeholders make data-informed decisions to improve student learning and labor market outcomes. The data system is owned by the State of New Jersey and operated by the John J. Heldrich Center for Workforce Development at Rutgers, The State University of New Jersey. NJSDS is a collaboration between the New Jersey Office of the Secretary of Higher Education, the New Jersey Department of Labor and Workforce Development, the New Jersey Department of Education, and the New Jersey Higher Education Student Assistance Authority.

About the Heldrich Center for Workforce Development

The John J. Heldrich Center for Workforce Development at Rutgers University is devoted to transforming the workforce development system at the local, state, and federal levels. The center, based at the Edward J. Bloustein School of Planning and Public Policy, provides an independent source of analysis for reform and innovation in policymaking and employs cutting-edge research and evaluation methods to identify best practices in workforce development, education, and employment policy. It is also engaged in significant partnerships with the private sector, workforce organizations, and educational institutions to design effective education and training programs. It is deeply committed to assisting job seekers and workers attain the information, education, and skills training they need to move up the economic ladder.

As captured in its slogan, "Solutions at Work," the Heldrich Center is guided by a commitment to translate the strongest research and analysis into practices and programs that companies, community-based organizations, philanthropy, and government officials can use to strengthen workforce and workforce readiness programs, create jobs, and remain competitive. The center's work strives to build an labor market that matches workers' skills and knowledge with the evolving demands of employers.