

2021



# Early Economic Return on Higher Education Investment

Evidence from the Kentucky High School Class of 2011



## About the Council on Postsecondary Education

The Council on Postsecondary Education is Kentucky's higher education coordinating agency committed to strengthening our workforce, economy and quality of life. We do this by guiding the continuous improvement and efficient operation of a high-quality, diverse, and accessible system of postsecondary education.

Key responsibilities include:

- developing and implementing a strategic agenda for postsecondary education that includes measures of progress.
- producing and submitting a biennial budget request for adequate public funding of postsecondary education.
- determining tuition rates and admission criteria at public postsecondary institutions.
- collecting and distributing data about postsecondary education performance.
- ensuring the coordination and connectivity of technology among public institutions.
- licensing non-public postsecondary institutions to operate in the Commonwealth.

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# FROM THE PRESIDENT

As president of the Council on Postsecondary Education, I have made it my mission to prove that a college credential is worth the cost. To that end, I present this report, “Early Economic Return on Higher Education Investment,” which details return on investment for Kentucky’s high school class of 2011.

The bottom line is that higher education pays in Kentucky. In 2019, eight years after graduating high school, students in the cohort with a college credential were making significantly more than high school graduates, despite fewer years of full-time work. A typical bachelor’s degree graduate who finished in four years earned \$41,915, compared to \$29,478 for a typical high school graduate, a median difference of \$12,437. At this salary, it would take just five years to recoup college costs. The typical associate degree graduate earning \$38,268 recoups college costs in about three years, while a typical certificate holder earning \$37,369 recoups costs in about two and half years.

A shortcoming of the report is the inability to look at wages of the cohort over a longer period of time. Data from the U.S. Bureau of Labor Statistics show that the earnings differential between high school and college graduates continues to grow as degree earners climb the career ladder and pursue additional education. Over a lifetime, the median lifetime earnings of a Kentucky bachelor’s degree graduate are \$1 million more than a high school graduate, while median earnings for associate degree graduates are nearly \$400,000 more.

Additionally, this report should help dispel some of the common misperceptions about college costs and student loan debt. The net cost of a credential is significantly less than the published cost of attendance, and the median loan debt of most graduates is affordable.

Finally, this report repeatedly shows that finishing your credential on time is one of the best college affordability strategies. Taking one or two additional years to complete a bachelor’s degree significantly increases costs and decreases earnings potential, at least in the short run.

When considering whether or not college is worth it, I urge you to rely on data, not anecdotal information. The numbers in this report speak for themselves.



Dr. Aaron Thompson, President  
Council on Postsecondary Education



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***The bottom line is that higher education pays in Kentucky. In 2019, eight years after graduating high school, students in the cohort with a college credential were making significantly more than high school graduates, despite fewer years of full-time work.***



# EXECUTIVE SUMMARY

*This report tracks 43,655 Kentucky students from their high school graduation in 2011 to 2019, the most recent year of data available. Key findings include:*

**About a third (36.2%) of the high school class of 2011 completed a college credential by 2019.**

While 73.6% of students in the cohort enrolled in college either in-state or out-of-state by 2019, only 36.2% had completed a postsecondary credential.

**The median out-of-pocket cost for a public postsecondary credential was much lower than the published cost of attendance.**

A college's published cost of attendance includes both direct costs like tuition and fees as well as indirect costs like room and board. Due to financial aid, students paid a fraction of the total cost of attendance. The median net cost was \$21,063 for a certificate/diploma, \$25,778 for an associate degree and \$59,800 for a bachelor's degree completed in four years. Taking longer to complete raised net cost considerably.

**Financial aid covered 28% to 34% of total cost of attendance for on-time graduates.**

The amount of grants and scholarships awarded to a typical student covered 28% of the total cost of attendance of a certificate/diploma, 30% of an associate degree, and 34% of a four-year bachelor's degree. This percentage fell to 21% for a five-year bachelor's degree and 19% for a six-year degree.

**Just over half (52.9%) of college goers in the cohort borrowed student loans to finance their education.**

Typical borrowers had a total loan balance of \$8,595 for a certificate/diploma, \$8,309 for an associate degree, \$25,421 for a four-year bachelor's degree, \$32,058 for a five-year bachelor's degree, and \$33,688 for a six-year bachelor's degree. The corresponding monthly loan

payments were around \$90 for a certificate/diploma and associate degree, \$267 for a four-year bachelor's degree, \$337 for a five-year bachelor's degree, and \$352 for a six-year bachelor's degree.

**In 2019, college graduates in the cohort earned substantially more than high school graduates at all credential levels.**

After eight years of being in the workforce, high school graduates earned a median annual salary of \$29,478. By comparison, in 2019, certificate/diploma holders earned \$37,369, associate degree holders earned \$38,268, and on-time bachelor's degree holders earned \$41,915 with fewer years of full-time work experience.

**For students graduating on time, median loan debts were reasonable.**

Debt-to-income ratio is a methodology used to determine if loan debt is reasonably affordable. To calculate this ratio, a student's total loan debt is divided by annual entry-level earnings. Amounts less than one indicate a reasonable level of debt, while amounts exceeding one suggest a risk of default, at least initially. The median debt-to-income ratio was 0.43 for a certificate/diploma graduate, 0.33 for an associate graduate, 0.90 for a four-year bachelor's graduate, 1.15 for a five-year bachelor's graduate, and 1.28 for a six-year bachelor's graduate.

**Nearly 44% of four-year bachelor's degree graduates were in the 75th percentile of Kentucky earners in 2019, compared to only 21.4% of high school graduates.**

Overall, economic standing improved with each successive level of education. Just as college graduates in the cohort were more likely to be earning at the highest income percentiles, they were much less likely to be making below \$20,000 a year (below the 25th percentile).

# COHORT PROFILE



This report highlights higher education's early return on investment for the Kentucky high school class of 2011. It follows 43,655 students who graduated from a Kentucky high school in 2011 to 2019, the most recent year of data available.

Over half (55.5%) of students in the cohort entered a public or independent non-profit Kentucky college or university directly from high school, while 5.7% enrolled out-of-state or at an in-state, for-profit institution. By 2019, just over a third (36.2%) of the cohort had completed a postsecondary credential, either in- state or out-of-state. A similar percentage (37.4%) left college before completing a credential or were still enrolled at the end of 2019.

Over a quarter (26.4%) of students in the cohort never enrolled in postsecondary education. These individuals were disproportionately male (61.7%), low-income (60.3%) and from an underrepresented minority group

(16.2%), compared to the cohort overall. Individuals without postsecondary credentials are at much greater risk of poverty and significantly more likely to be unemployed or receiving government assistance.

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Of the 16,338 students who left college without a credential or were still enrolled in 2019, 50.7% were male, 51.4% were low-income, and 21% were from an underrepresented minority group. In comparison, the majority of the 15,809 credential completers in the cohort were female (58.7%), non low-income (73.7%), and non-URM (88.4%).

Among in-state college-goers in the cohort, the vast majority of credential completions (70.5%) were at the bachelor's degree level and above. Nearly 60% of completers earned a bachelor's degree, 18.3% earned an associate degree, 11.8% earned a post-baccalaureate credential, and 11.2% earned a certificate or diploma.

# KENTUCKY'S HIGH SCHOOL GRADUATING CLASS OF 2011

CLASS SIZE:

**43,655**

AVERAGE H.S. GPA:

**2.84**

AVERAGE ACT:

**18.8**

English: **18.1**

Math: **18.5**

Reading: **19.1**

Science: **19.0**

ATTENDED COLLEGE  
DIRECTLY FROM  
HIGH SCHOOL (IN-  
STATE & OUT-OF-  
STATE, NON-PROFIT  
& FOR-PROFIT)

**26,570**

**(60.9%)**

ATTENDED KY  
PUBLIC OR  
INDEPENDENT  
COLLEGE:

**24,249**

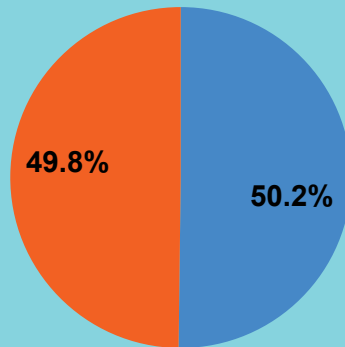
**(55.5%)**

COMPLETED A  
CREDENTIAL:

**15,809**

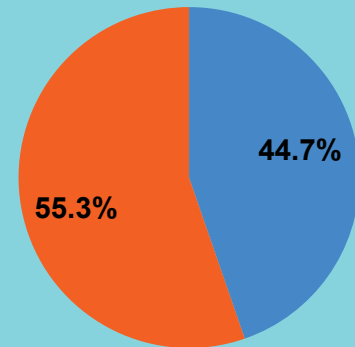
**(36.2%)**

Gender



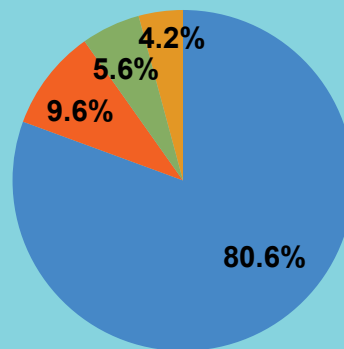
■ Male ■ Female

Income



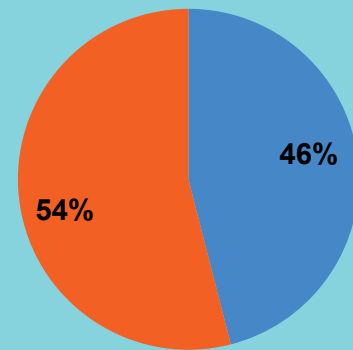
■ Low-Income ■ Non Low-Income

Race/Ethnicity



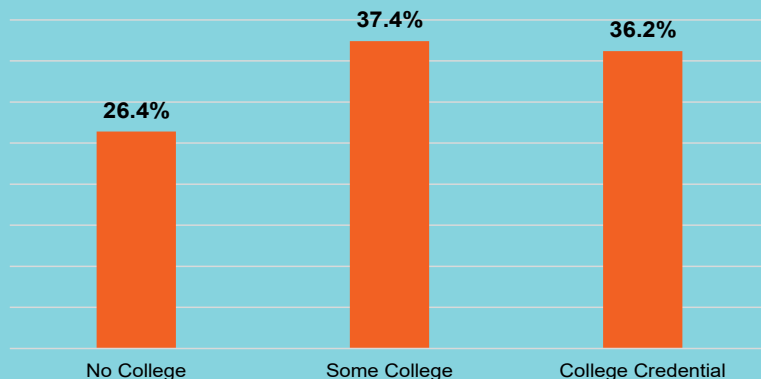
■ White ■ Black ■ Latinx ■ Other

Locale



■ Rural ■ Urban

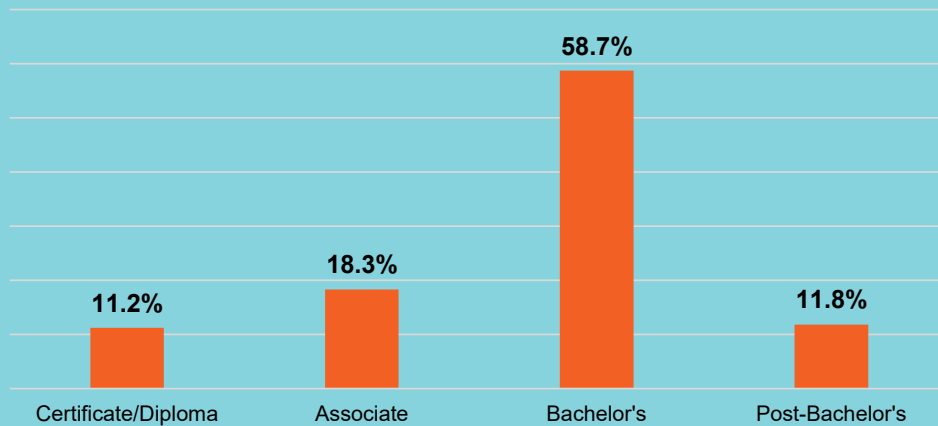
Education Level in Academic Year 2018-19



Source: Kentucky Longitudinal Data System

# KENTUCKY'S HIGH SCHOOL GRADUATING CLASS OF 2011

## Of the 13,727 College Completers...



## Descriptive Characteristics Among Students, by Education Level

	All	No College <sup>1</sup>	Some College <sup>2</sup>	College Completion <sup>3</sup>
<b>GENDER</b>				
Female	49.8%	38.3%	49.3%	58.7%
Male	50.2%	61.7%	50.7%	41.3%
<b>LOW-INCOME</b>				
Yes	44.7%	60.3%	51.4%	26.3%
No	55.3%	39.7%	48.6%	73.7%
<b>URM</b>				
Yes	16.4%	16.2%	21.0%	11.6%
No	83.6%	83.8%	79.0%	88.4%
<b>LOW-INCOME &amp; URM</b>				
Yes & Yes	10.6%	11.9%	14.3%	5.7%
Yes & No	34.1%	48.4%	37.2%	20.6%
No & Yes	5.8%	4.3%	6.7%	6.0%
No & No	49.5%	35.4%	41.8%	67.7%
<b>LOCALE</b>				
Rural	46.0%	48.8%	45.4%	44.5%
Urban	54.0%	51.2%	54.6%	55.5%
<b>APPALACHIAN</b>				
Yes	29.6%	31.2%	30.4%	27.6%
No	70.4%	68.8%	69.6%	72.4%

1. Never enrolled in college by end of AY 2018-19.

2. Enrolled in college but left without credential or still enrolled by end of AY 2018-19. Both in-state and out-of-state students.

3. Completed a credential in-state or out-of-state by end of AY 2018-19. Both in-state and out-of-state students.



# COST OF COLLEGE



The typical out-of-pocket cost of a public postsecondary credential was significantly lower than the published cost of attendance (including both direct and indirect costs). Financial aid covered from 19% to 34% of the total cost of attendance, depending on the credential earned.

Figure 1. Median Cost of Attendance, Grants/Scholarships & Net Cost

Credential Level	Years to Degree	TOTAL (2011-2019)			
		Median Cost of Attendance	Median Grants & Scholarships	Median Net Cost	Median % Funded by Aid
Certificate/Diploma	3	\$28,200	\$6,564	\$21,063	28%
Associate	3	\$40,077	\$11,407	\$25,778	30%
Bachelor's	4	\$90,641	\$30,871	\$59,800	34%
Bachelor's	5	\$110,000	\$24,385	\$85,218	21%
Bachelor's	6	\$130,000	\$23,471	\$100,000	19%

Source: Kentucky Longitudinal Data System, amounts in 2019 inflation-adjusted dollars.

## COST OF ATTENDANCE

Direct costs of college, including published tuition, mandatory fees and textbook costs, as well as indirect costs (e.g., housing, food, transportation). Also known as sticker price.

## GRANTS & SCHOLARSHIPS

Includes federal, state and campus-funded scholarships and grants. Scholarships are generally awarded for academic merit, while grants are based on financial need. Unlike loans, scholarships and grants don't need to be paid back.

## NET COST

What students actually pay for college. Also known as out-of-pocket cost.

Total cost of attendance is the estimated cost of attending a particular college or university, also called the sticker price. It includes both direct costs, like published tuition, mandatory fees and cost of books, as well as indirect costs, like housing, food and transportation. The amounts in Figure 1 represent the median cost of credentials earned from Kentucky public postsecondary institutions for students in the high school class of 2011.

Net cost, or out-of-pocket cost, is the amount that students actually pay for college, once federal, state and campus-funded scholarships and grants are taken into account. Since grants and scholarships do not need to be paid back, net cost includes amounts paid up-front and/or borrowed by the student.

Figure 1 illustrates the importance of time-to-degree in determining a student's total cost. A typical student who finished a bachelor's degree in four years paid just under \$60,000 for the degree, significantly less than the total cost of attendance due to the \$30,871 of financial aid awarded. As time to complete increased, the amount of aid did not, which reduced its buying power. Adding one additional year to a bachelor's degree raised the median net cost to \$85,218; completing in six years raised it to \$100,000, an increase of about 67%.

# COST OF COLLEGE



The total net cost of a public postsecondary credential was much less for low-income students, strengthening equitable access to postsecondary opportunities. Financial aid for low-income students accounted for 36% to 58% of the total cost of attendance, compared to 8% to 29% for non low-income students.

Figure 2. Median Cost of Attendance, Grants/Scholarships & Net Cost by Income

Credential Level	Years to Degree	TOTAL (2011-2019)							
		Median Cost of Attendance		Median Grants & Scholarships		Median Net Cost		Median % Funded by Aid	
		Low-Income	Not Low-Income	Low-Income	Non Low-Income	Low-Income	Non Low-Income	Low-Income	Non Low-Income
Certificate/Diploma	3	\$28,030	\$28,200	\$9,895	\$2,005	\$15,919	\$26,890	41%	8%
Associate	3	\$40,077	\$40,077	\$23,213	\$5,914	\$17,358	\$30,646	58%	16%
Bachelor's	4	\$85,730	\$91,374	\$47,251	\$26,496	\$36,728	\$64,190	54%	29%
Bachelor's	5	\$110,000	\$110,000	\$43,863	\$17,076	\$60,964	\$91,095	41%	15%
Bachelor's	6	\$130,000	\$130,000	\$44,214	\$14,740	\$79,531	\$110,000	36%	11%

Source: Kentucky Longitudinal Data System, amounts in 2019 inflation-adjusted dollars.

## COST OF ATTENDANCE

Direct costs of college, including published tuition, mandatory fees and textbook costs, as well as indirect costs (e.g., housing, food, transportation). Also known as sticker price.

## GRANTS & SCHOLARSHIPS

Includes federal, state and campus-funded scholarships and grants. Scholarships are generally awarded for academic merit, while grants are based on financial need. Unlike loans, scholarships and grants don't need to be paid back.

## NET COST

What students actually pay for college. Also known as out-of-pocket cost.

Students were considered low-income in this study if they were eligible for free- or reduced-price lunch in high school. Because a sizable portion of grants and scholarships are determined by financial need, low-income students ultimately had lower net costs than students who were not low-income. The median net costs for low-income students were \$15,919 for a certificate/diploma, \$17,358 for an associate degree, and \$36,728 for a four-year bachelor's degree, strengthening equitable access to postsecondary opportunities. Extending the bachelor's degree by one or two years eroded college affordability significantly.

# COST OF COLLEGE



Net cost varied by credential level and discipline. At the associate and baccalaureate levels, business degrees had among the highest net cost, while health degrees had among the lowest.

Figure 3. Median Cost of Attendance, Grants/Scholarships & Net Cost by Discipline and Credential\*

Discipline	Certificate/Diploma			
	Median Cost of Attendance	Median Grants & Scholarships	Median Net Cost	Median % Funded by Aid
Business	\$24,911	\$9,938	\$10,911	27%
Health	\$28,200	\$6,215	\$20,446	25%
Trades	\$28,819	\$7,030	\$21,114	32%
Associate				
Arts/Humanities	\$39,429	\$11,563	\$25,746	31%
Business	\$40,931	\$14,562	\$28,370	36%
Health	\$40,192	\$22,126	\$19,199	51%
Trades	\$37,073	\$4,622	\$26,493	13%
Four-Year Bachelor's				
Arts/Humanities	\$91,417	\$36,508	\$54,449	43%
Business	\$93,063	\$27,079	\$64,629	30%
Education	\$90,767	\$26,037	\$62,534	29%
Health	\$84,952	\$29,805	\$57,019	35%
Social Sciences	\$89,753	\$34,426	\$58,884	38%
STEM	\$90,767	\$33,687	\$57,230	37%
Trades	\$83,505	\$29,734	\$55,114	34%
Five-Year Bachelor's				
Arts/Humanities	\$110,000	\$25,065	\$83,070	23%
Business	\$110,000	\$18,714	\$88,190	18%
Education	\$110,000	\$20,598	\$83,720	20%
Health	\$110,000	\$29,178	\$77,021	27%
Social Sciences	\$110,000	\$29,169	\$81,359	26%
STEM	\$120,000	\$25,236	\$89,964	22%
Trades	\$43,083	\$18,475	\$84,804	17%
Six-Year Bachelor's				
Business	\$130,000	\$22,630	\$100,000	17%
Health	\$130,000	\$20,038	\$110,000	15%
Social Sciences	\$130,000	\$26,580	\$110,000	20%
STEM	\$140,000	\$20,427	\$110,000	15%
Trades	\$120,000	\$28,875	\$94,117	24%

Source: Kentucky Longitudinal Data System, amounts in 2019 inflation-adjusted dollars.

\*Calculations for several disciplines at the certificate/diploma, associate, and six-year bachelor's degree levels were redacted due to small sample sizes. All calculations for social sciences and STEM were redacted at the certificate/diploma and associate levels, and calculations for arts and humanities and education were redacted at the six-year bachelor's degree level.

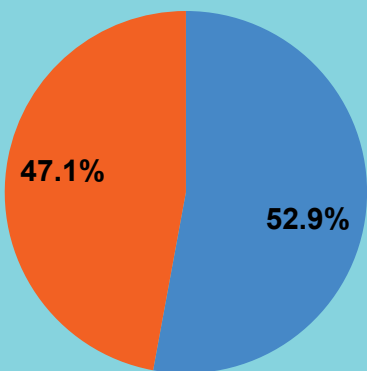
# BORROWER PROFILE



Just over half (52.9%) of in-state college-goers in the cohort took out loans to finance their education. Borrowers were more likely than non-borrowers to be female, low-income and from an underrepresented minority group. Among Kentucky credential completers, nearly 60% of bachelor's graduates and 57.4% of associate graduates took out student loans.

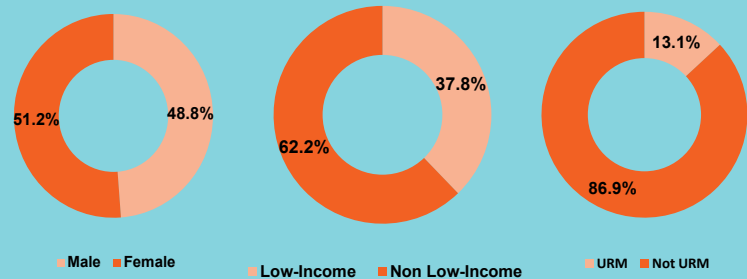
In this study, borrowers are students who took out at least one student loan over the course of their studies, such as federal subsidized loans, federal unsubsidized loans, institutional loans, or loans from private lenders. Typically, students start repaying loans six months after they exit college, usually over a ten-year term. Subsidized loans accrue no interest until six months after graduation. Unsubsidized loans begin accruing interest at the time the loan is borrowed. Because interest rates for non-federal loans vary, this study assumes all non-federal loans have the same interest rate as federal unsubsidized loans.

Percent of borrowers and non-borrowers among the 28,185 students in the Class of 2011 enrolling in KY institutions:

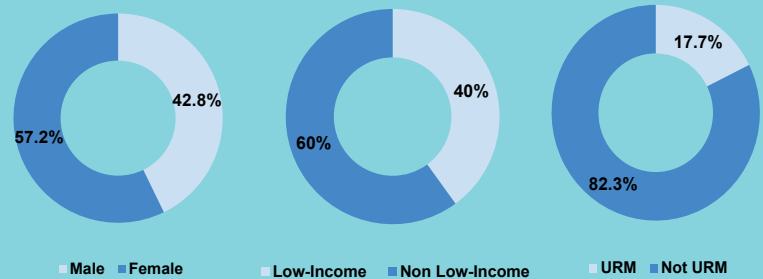


■ Borrowers ■ Non-Borrowers

Characteristics of non-borrowers:



Characteristics of borrowers:



Among the 13,727 students in the cohort who completed a credential:

	Non-Borrowers	Borrowers
<b>EDUCATION LEVEL</b>		
Certificate/Diploma	50.7%	49.3%
Associate	42.6%	57.4%
Bachelor's	40.4%	59.6%
Post-Bachelor's	53.6%	46.4%

Source: Kentucky Longitudinal Data System



# STUDENT LOAN DEBT



A typical student borrowed from \$8,309 (for an associate degree) to \$33,688 (for a six-year bachelor's degree) for their credential. Median loan amounts were similar for low-income and non low-income students, except at the associate level.

**Figure 4. Median Loan Amount by Income and Credential Level**

EDUCATION LEVEL	TOTAL (2011-2019)		
	Median Loan Amount (All Borrowers)	Median Loan Amount (Low-Income Borrowers)	Median Loan Amount (Non Low-Income Borrowers)
Certificate/Diploma	\$8,595	\$8,595	\$7,634
3-Year Associate	\$8,309	\$4,358	\$9,575
4-Year Bachelor's	\$25,421	\$25,345	\$25,492
5-Year Bachelor's	\$32,058	\$30,850	\$32,896
6-Year Bachelor's	\$33,688	\$31,604	\$34,189

Source: Kentucky Longitudinal Data System, amounts in 2019 inflation-adjusted dollars.

Figure 4 provides median loan balances by credential level. This amount includes an estimate of loan interest accrued (see Technical Notes, page 27).

At the baccalaureate level, students had comparable levels of debt, regardless of income. However, low-income associate degree earners had a median loan amount of \$4,358, about half as much as non low-income associate degree earners. Non low-income certificate/diploma holders had a lower median loan amount than low-income certificate/diploma holders (\$7,634 versus \$8,595).

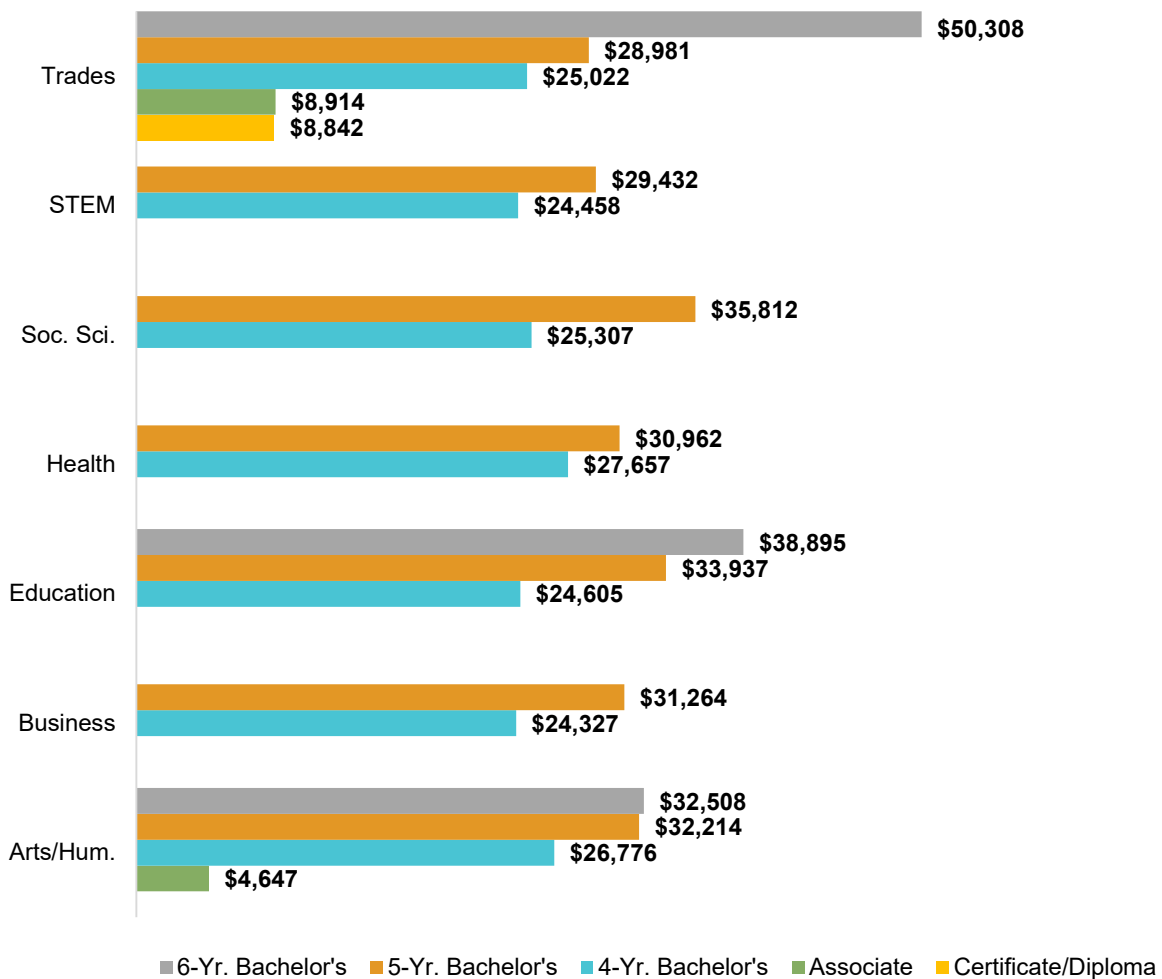
Although not reflected in this table, half of students in the cohort who left college without a credential had student loan balances at the time of exit. These are the students most at risk of loan default, since they are less likely to earn a salary enabling them to comfortably manage monthly payments.

# STUDENT LOAN DEBT



A typical four-year bachelor's degree recipient borrowed from \$24,327 to \$27,657 in student loans, regardless of academic discipline. Among these borrowers, health majors had higher loan balances but also had higher entry-level salaries. Taking one or two additional years to complete a bachelor's degree raised loan balances substantially.

Figure 5. Median Loan Amount by Discipline and Credential Level\*



Source: Kentucky Longitudinal Data System, amounts in 2019 inflation-adjusted dollars.

\*Calculations for business, health, social sciences, and STEM at the certificate/diploma level, associate degree level, and 6-year bachelor's degree level were redacted due to small sample sizes

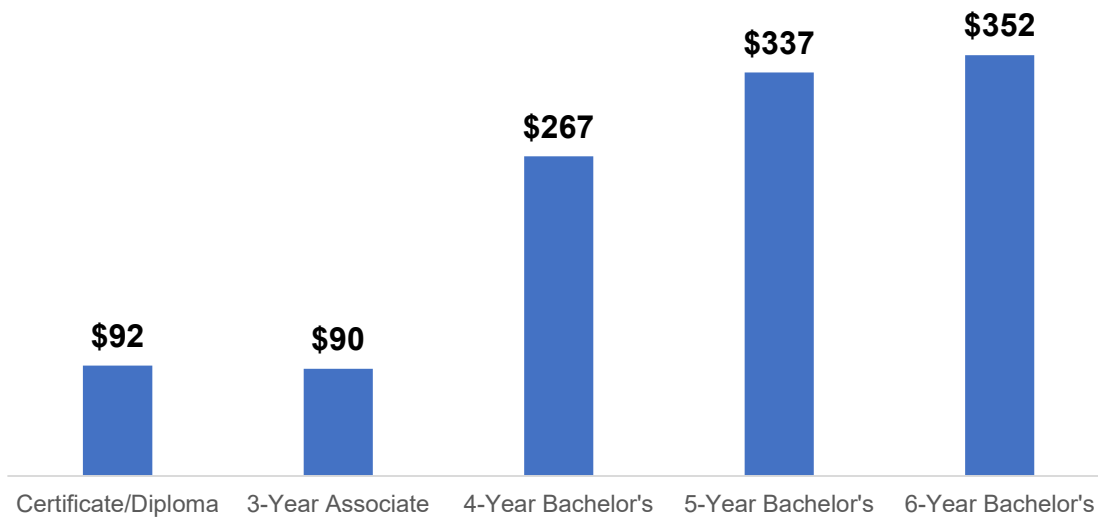
The typical amounts of accumulated loan debt across all disciplines for four-year bachelor's degree recipients were similar, ranging from \$24,327 to \$27,657. Among four-year bachelor's degree recipients, health majors borrowed the most (\$27,657). However, health care jobs at the baccalaureate level offered among the highest entry-level earnings, as seen on page 20. There were greater variations in loan amounts across all disciplines at the five-year bachelor's degree level. Taking one or two additional years to complete a bachelor's degree raised loan balances substantially.

# STUDENT LOAN DEBT



Bachelor's degree recipients who graduated in four years had a monthly student loan payment of around \$267. This monthly payment increased to \$337 if they finished in five years, and to \$352 if they finished in six.

Figure 6. Maximum Monthly Student Loan Payment by Credential Level



Source: KDLS and <https://studentaid.gov/manage-loans/repayment/plans>.

The monthly loan payments presented in Figure 6 were generated by an amortization period of ten years as suggested by studentaid.gov <https://studentaid.gov/manage-loans/repayment/plans>. In general, monthly loan payments increased the longer it took to complete a credential. The exception was for certificate/diploma earners, who had slightly higher payments than associate degree earners.

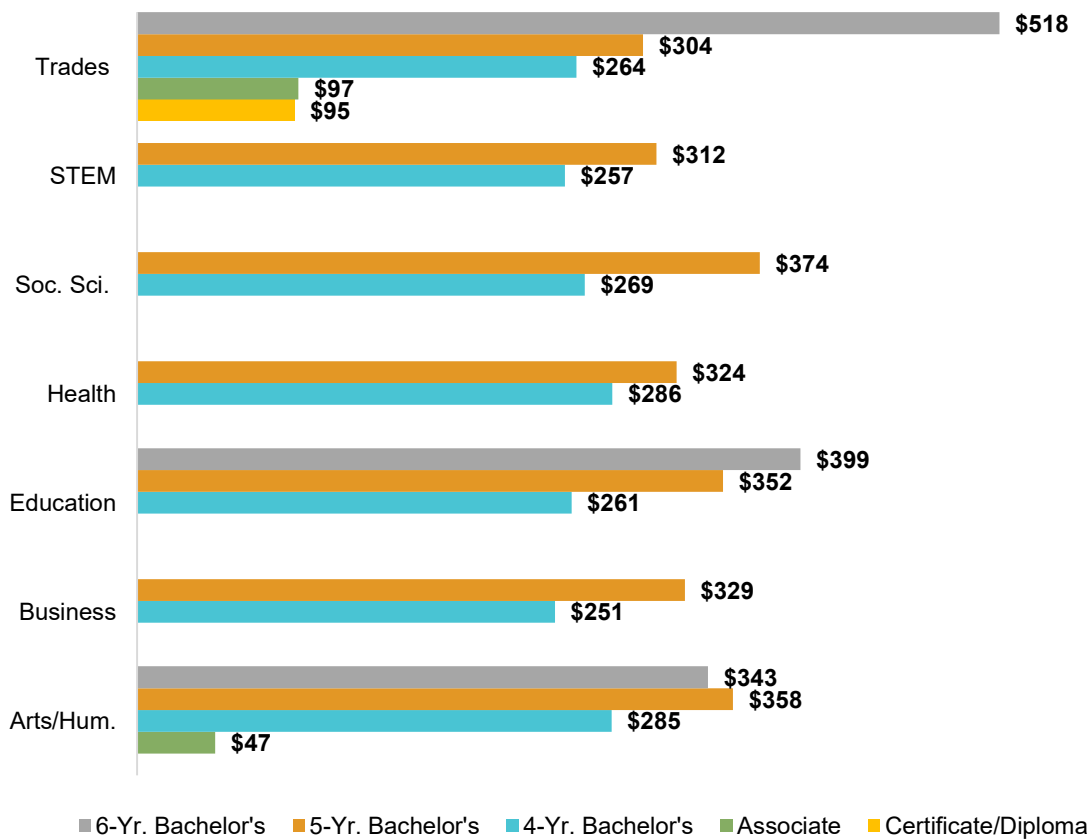
For four-year bachelor's degree recipients, the estimated monthly loan payment was \$267. Completing in five years increased the monthly payment by \$70; the monthly payment increased by \$85 for bachelor's degree graduates completing in six years.

# STUDENT LOAN DEBT



Among four-year bachelor's degree graduates, monthly student loan payments were similar across academic disciplines, ranging from a low of \$251 for business majors to a high of \$286 for health majors.

Figure 7. Maximum Monthly Student Loan Payment by Discipline and Credential Level\*



Source: KDLS and <https://studentaid.gov/manage-loans/repayment/plans>.

\*Calculations for business, health, social sciences, and STEM at the certificate/diploma level, associate degree level, and 6-year bachelor's degree level were redacted due to small sample sizes

Figure 7 provides a more granular look at maximum monthly loan payments by credential level and discipline. The monthly loan payments for students completing a bachelor's degree within four years were similar across all academic disciplines, ranging from a low of \$251 for business majors to a high of \$286 for health majors. There were more variances in monthly loan payments across all disciplines at the five-year bachelor's degree level, ranging from a low of \$304 for students majoring in trades to a high of \$374 for social sciences majors.

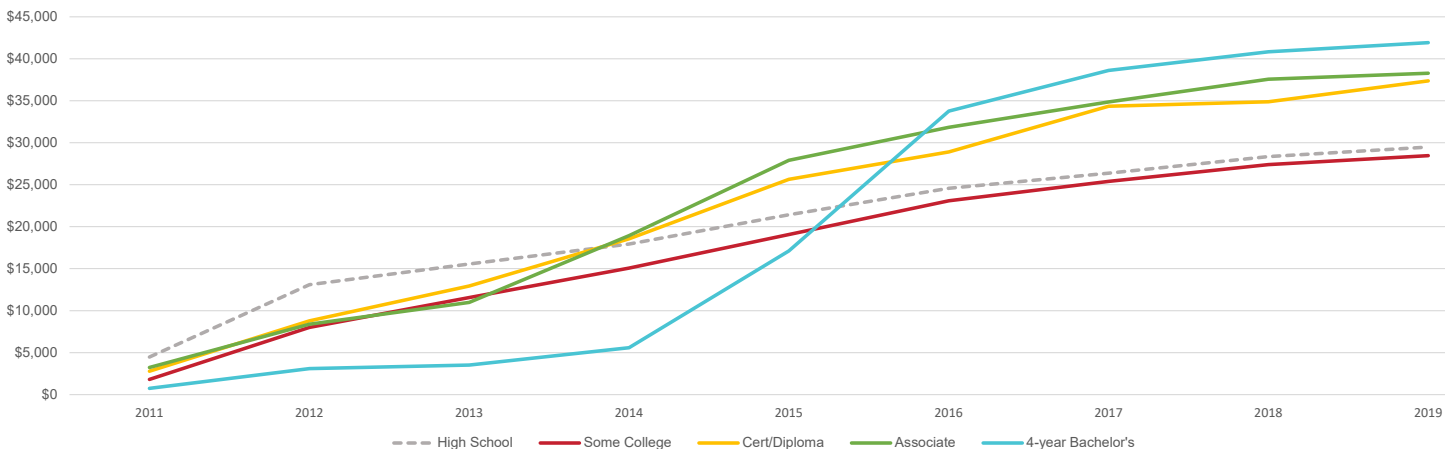


# EARNINGS



In 2019, the median salary for a bachelor's degree graduate was nearly \$42,000 a year, compared to \$29,478 for a high school graduate. Typical associate degree graduates earned \$38,268, and certificate holders earned \$37,369, despite fewer years of full-time work.

Figure 8. Median Earnings from 2011-19, by Credential Level



	2011	2012	2013	2014	2015	2016	2017	2018	2019
High School	\$4,479	\$13,088	\$15,550	\$17,922	\$21,429	\$24,572	\$26,379	\$28,360	\$29,478
Some College	\$1,815	\$7,994	\$11,562	\$15,060	\$19,055	\$23,075	\$25,403	\$27,388	\$28,463
Cert./Diploma	\$2,792	\$8,791	\$12,939	\$18,548	\$25,642	\$28,911	\$34,358	\$34,886	\$37,369
Associate	\$3,217	\$8,381	\$10,974	\$18,934	\$27,913	\$31,841	\$34,854	\$37,562	\$38,268
4-Year Bachelor's	\$731	\$3,098	\$3,506	\$5,589	\$17,106	\$33,778	\$38,614	\$40,836	\$41,915

Source: Kentucky Longitudinal Data System, amounts in 2019 inflation-adjusted dollars.

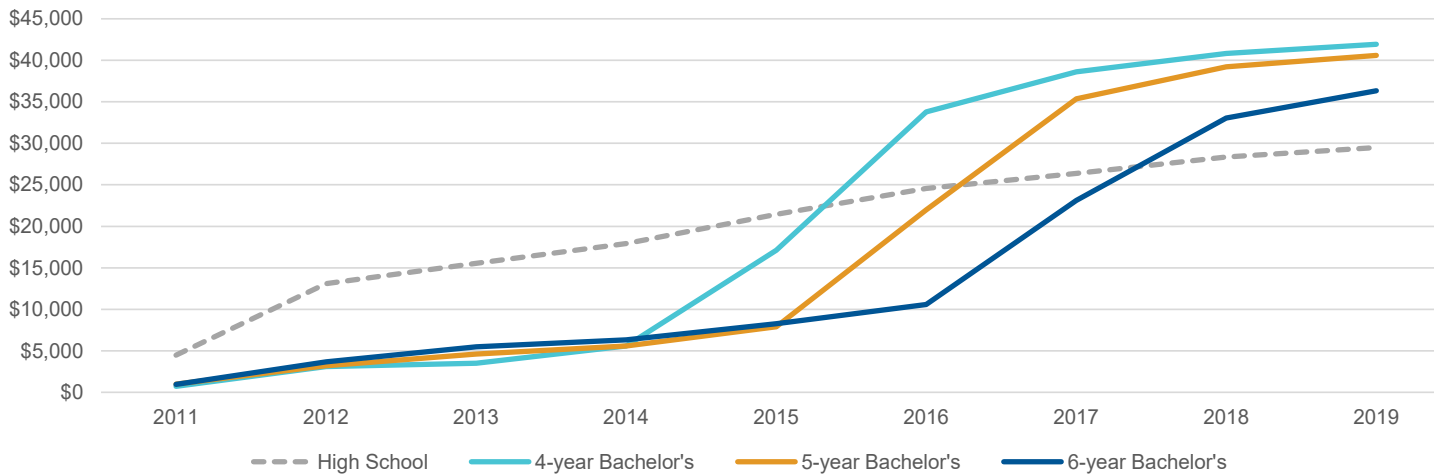
Studies consistently show that postsecondary education positively affects earnings, and the wages of Kentucky's high school class of 2011 bear this out. Figure 8 shows the median annual earnings for the cohort from 2011 to 2019, by credential level. While high school graduates directly entering the workforce start out earning more, they are quickly surpassed by college graduates once they start earning postsecondary credentials. In 2014, when certificate and associate degree holders left college, their median annual income jumped to \$18,548 and \$18,934, respectively, overtaking the median earnings of high school graduates (at \$17,922). Bachelor's degree students who finished in four years earned \$17,106 their first year out; by 2016, they were earning \$33,778 a year. Over time, the earnings differential between high school and college graduates grows even wider, as college graduates are promoted into higher paying positions and pursue additional levels of education.

# EARNINGS



Taking longer to complete a bachelor's degree not only raised college costs and loan amounts, it decreased earnings, at least initially.

**Figure 9. Median Earnings from 2011-19 for Bachelor's Degree Graduates**



	2011	2012	2013	2014	2015	2016	2017	2018	2019
High School	\$4,479	\$13,088	\$15,550	\$17,922	\$21,429	\$24,572	\$26,379	\$28,360	\$29,478
4-Year Bachelor's	\$731	\$3,098	\$3,506	\$5,589	\$17,106	\$33,778	\$38,614	\$40,836	\$41,915
5-Year Bachelor's	\$993	\$3,200	\$4,615	\$5,573	\$7,900	\$21,979	\$35,363	\$39,219	\$40,591
6-Year Bachelor's	\$968	\$3,665	\$5,487	\$6,338	\$8,269	\$10,577	\$23,134	\$33,045	\$36,344

Source: Kentucky Longitudinal Data System, amounts in 2019 inflation-adjusted dollars.

Extending a bachelor's degree to five or six years not only increased median net cost and student loan amounts, it also decreased earnings, at least initially. Figure 9 illustrates that students who took an additional year to complete a bachelor's degree (finishing in 2016 instead of 2015) earned lower salaries even three years later. Bachelor's degree graduates finishing in 2017 earned \$36,344 in 2019, compared to \$41,915 for on-time graduates.

# EARNINGS



While postsecondary education had a positive effect on entry-level earnings at every education level, female students earned less than male students, even with the same credentials.

Figure 10. Median Entry-Level Earnings by Gender and Credential Level

EDUCATION LEVEL	TOTAL (2011-2019)		
	Entry-Level Median Earnings for the Cohort	Entry-Level Median Earnings for Female Students	Entry-Level Median Earnings for Male Students
High School	\$12,036	\$10,236	\$13,305
Some College	\$13,299	\$12,407	\$14,533
Certificate/Diploma	\$17,690	\$14,109	\$20,189
3-Year Associate	\$22,631	\$17,507	\$25,096
4-Year Bachelor's	\$27,926	\$26,876	\$30,346
5-Year Bachelor's	\$27,983	\$25,960	\$30,185
6-Year Bachelor's	\$25,982	\$26,227	\$25,757

Source: Kentucky Longitudinal Data System, amounts in 2019 inflation-adjusted dollars.

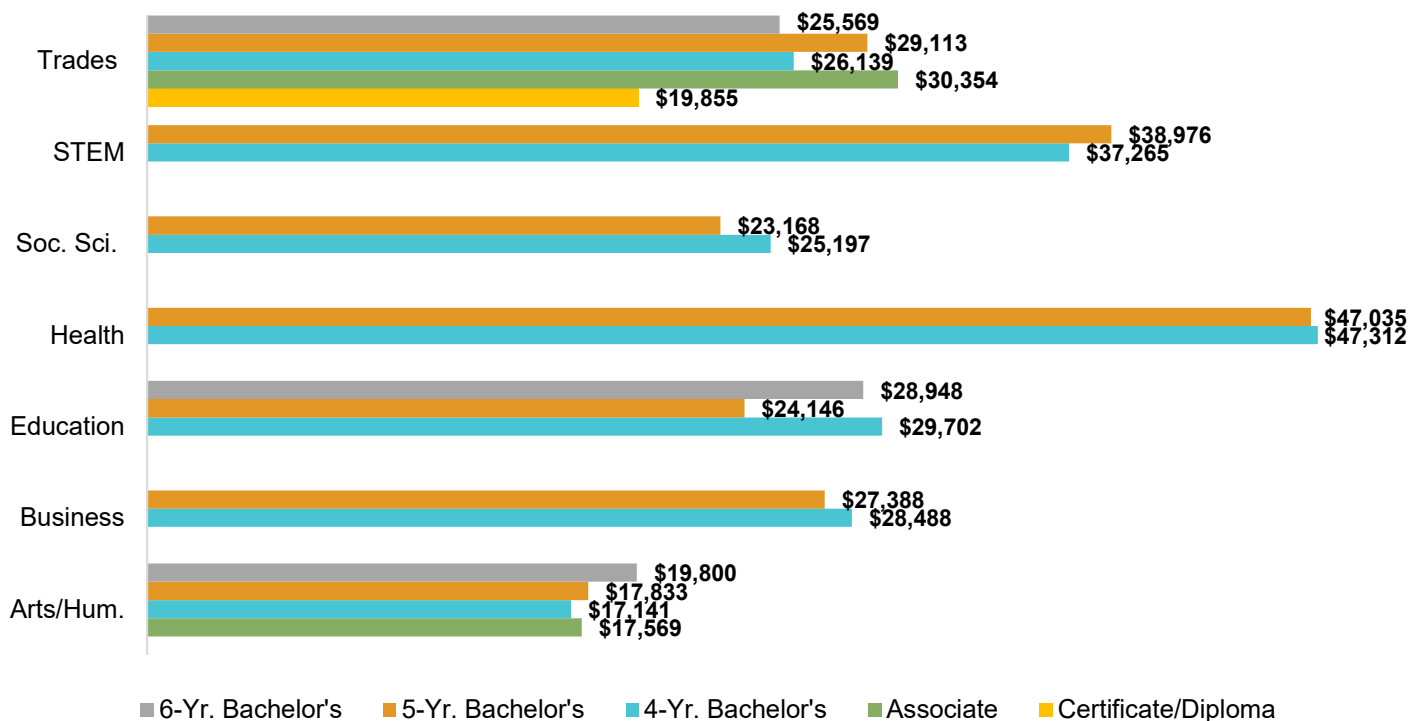
Looking at median entry-level earnings across credential levels, it is clear that postsecondary education positively affects earnings. A four-year bachelor's degree graduate starts out making almost \$28,000 a year, while a high school graduate starts out making about \$12,000 a year. There is a clear advantage for male students in the cohort, who out-earn female students at nearly every credential level. Right out of college, a female bachelor's degree graduate makes about as much as a male associate degree graduate, while a male bachelor's degree graduate makes significantly more (except at the six-year baccalaureate level).

# EARNINGS



Health and STEM majors typically had the highest entry-level earnings at the baccalaureate level, while arts/humanities majors typically had the lowest. However, studies show arts/humanities majors tend to narrow or close wage gaps over time.

Figure 11. Median Entry-Level Earnings by Discipline and Credential Level\*



Source: Kentucky Longitudinal Data System, amounts in 2019 inflation-adjusted dollars.

\*Calculations for arts/humanities, business, education, health, social sciences, and STEM at the certificate/diploma level; business, education, health, social sciences and STEM at the associate degree level, and business, health, social sciences and STEM at the 6-year bachelor's degree level were redacted due to small sample sizes.

Figure 11 presents median entry-level earnings in 2019 by academic discipline. Among four-year bachelor's degree earners, health majors had the highest median earnings (\$47,312) followed by STEM majors (\$37,265). Arts and humanities majors had the lowest salaries initially (\$17,141), but research by the American Academy of Arts and Sciences, the Association of American Colleges and Universities, and the Gallup-Purdue Index shows that humanities majors catch up over time, and more effectively close the pay gap between younger and older workers.

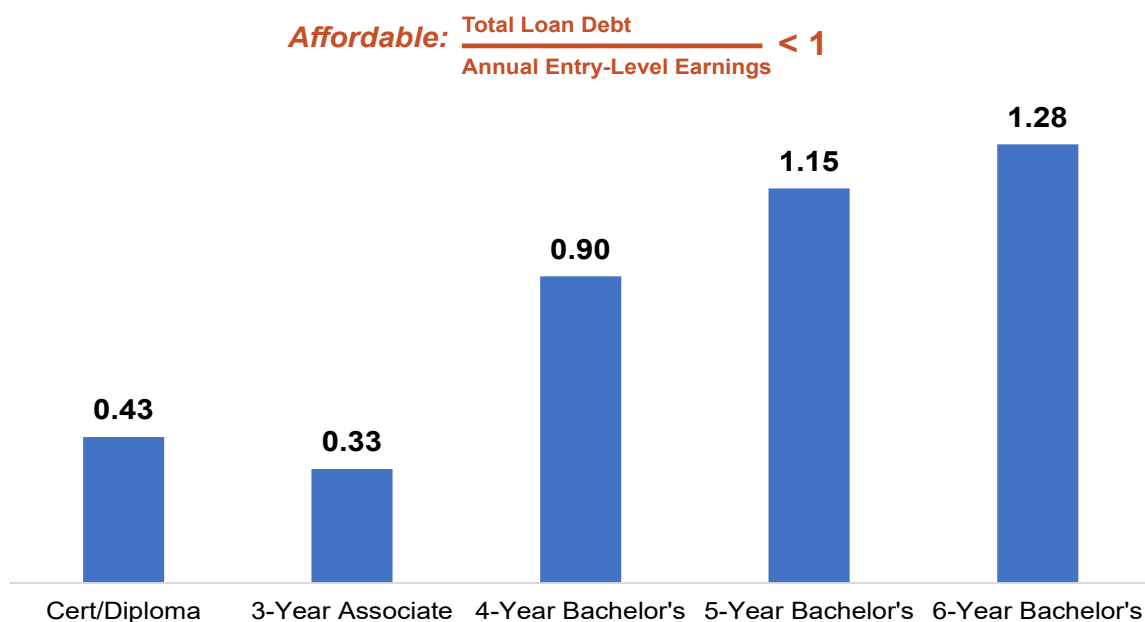


# DEBT-TO-INCOME RATIO



A debt-to-income ratio of less than one indicates that student loan debt is affordable. According to this methodology, students in the cohort who graduated on time had reasonable levels of student debt, while bachelor's degree students taking five or six years to complete were at greater risk of loan default early in their careers.

Figure 12. Median Debt-to-Income Ratio by Credential Level



Source: Kentucky Longitudinal Data System, amounts in 2019 inflation-adjusted dollars.

Higher education policy experts have long debated what constitutes a reasonable and affordable level of student loan debt. Debt-to-income ratio, which is total loan debt divided by the borrower's entry-level salary, is a simple but effective way to assess a borrower's ability to repay student loans. If the debt-to-income ratio is less than one, borrowers should be able to repay their student loan in ten years or less. Ideally, debt-to-income ratios decrease over time, as individuals earn higher salaries and loan balances diminish, which makes loans more affordable.

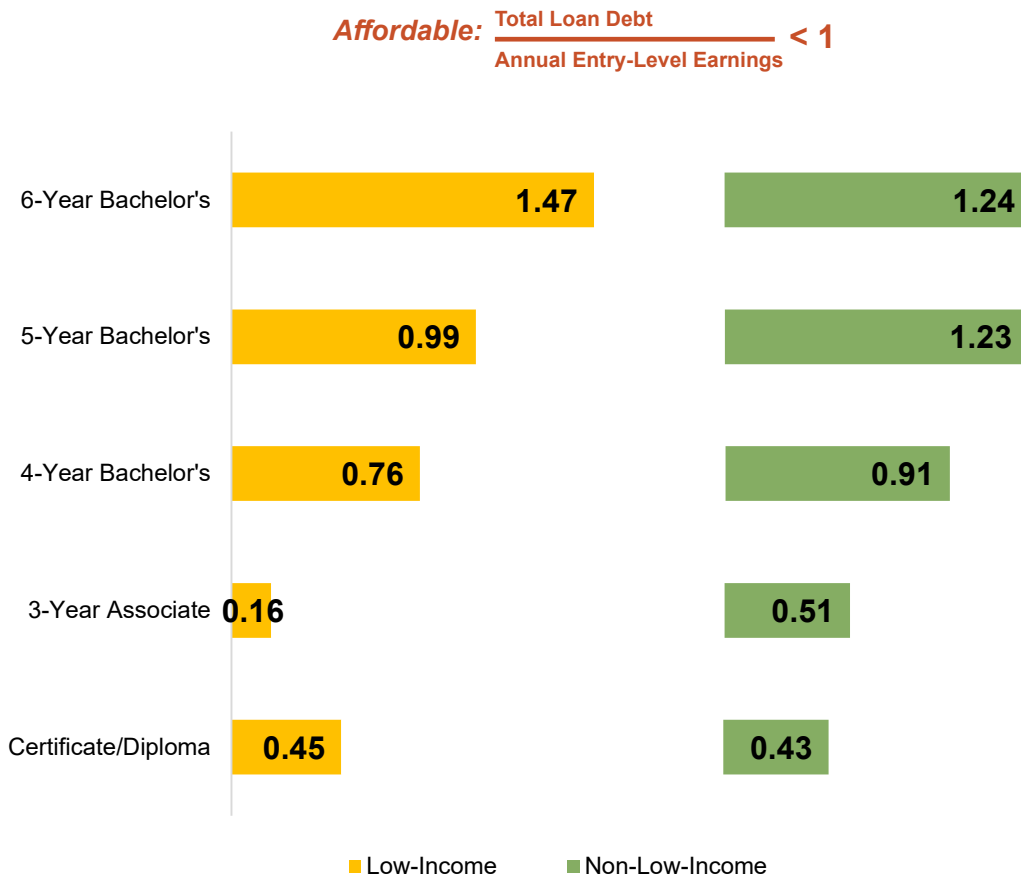
Figure 12 presents the median debt-to-income ratio by credential level. Certificate/diploma, associate and four-year bachelor's degree completers had debt-to-income ratios of less than one, which indicates a manageable level of student loan debt. On the other hand, the debt-to-income ratio for bachelor's degree graduates completing in five or six years exceeded one, placing them at greater risk of loan default early in their careers.

# DEBT-TO-INCOME RATIO



Low-income borrowers had lower debt-to-income ratios than non low-income borrowers, except at the certificate/diploma and six-year baccalaureate level.

Figure 13. Median Debt-to-Income Ratio by Income Status



Source: Kentucky Longitudinal Data System, amounts in 2019 inflation-adjusted dollars.

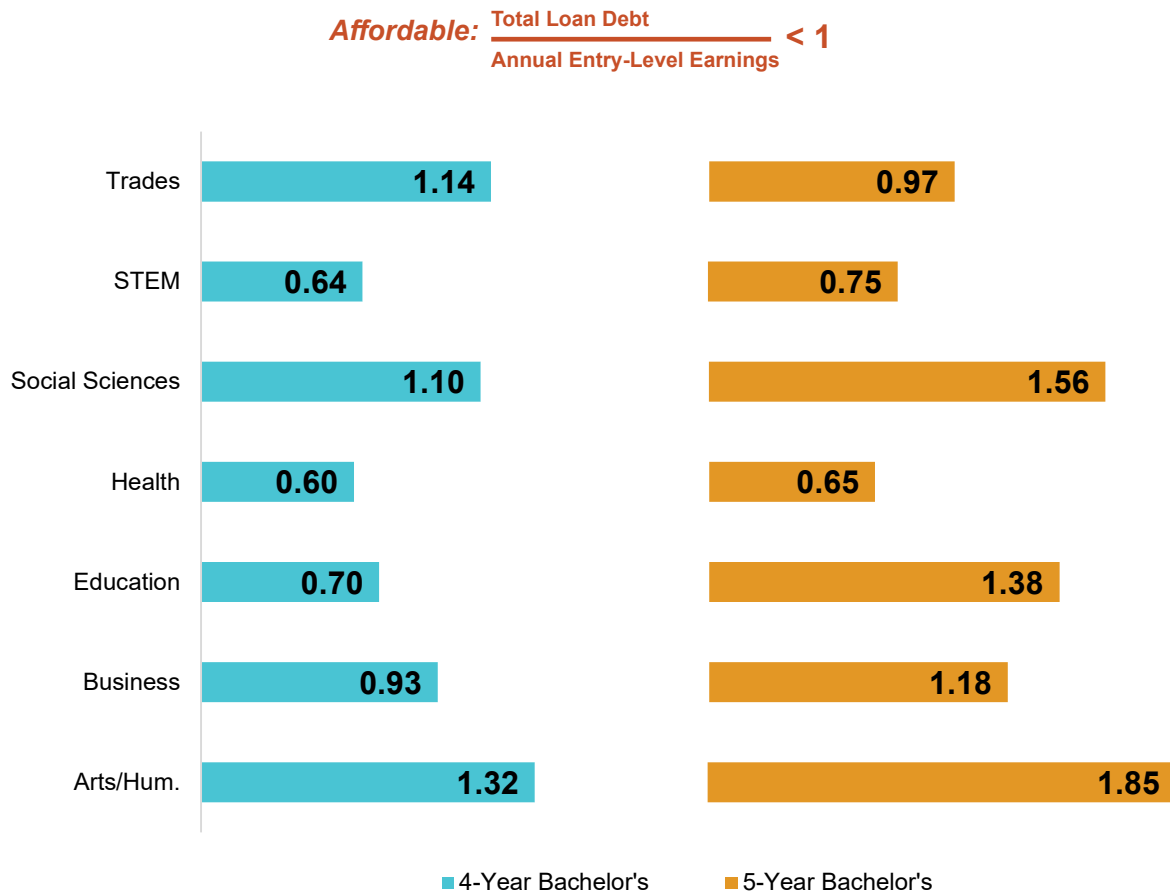
Figure 13 presents the median debt-to-income ratio by credential level for low-income and non low-income undergraduate students. Interestingly, at the four-year bachelor's degree level, low-income and non low-income students had comparable levels of student debt (around \$25,000), but substantially different debt-to-income ratios (0.76 for low-income students compared to 0.91 for non low-income students). According to this methodology, debt levels are less manageable for five- and six-year bachelor's degree earners, regardless of income status.

# DEBT-TO-INCOME RATIO



Borrowers with four-year degrees in the arts/humanities, social sciences and trades had the highest debt-to-income ratios, placing them at greater risk of loan default early in their careers. Borrowers with health and STEM degrees had the lowest debt-to-income ratios.

Figure 14. Debt-to-Income Ratio by Discipline at the Bachelor's Degree Level



Source: Kentucky Longitudinal Data System, amounts in 2019 inflation-adjusted dollars.

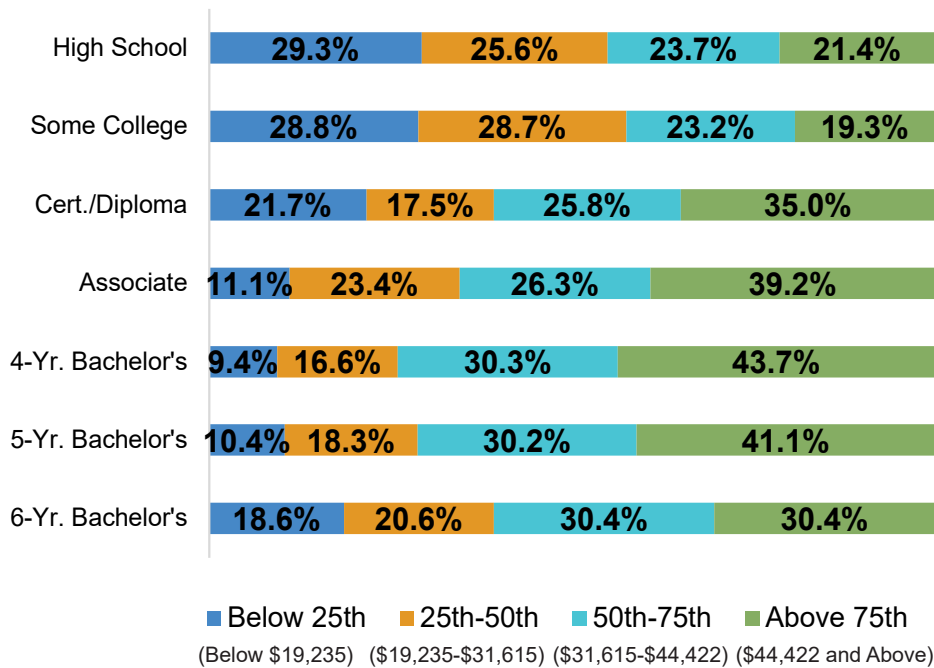
Figure 14 examines the median debt-to-income ratio by discipline for four-year and five-year bachelor's degree graduates. Predictably, since arts and humanities and social sciences majors had the lowest starting salaries, they had the highest debt-to-income ratios. Health and STEM majors had comparable levels of student loan debt but higher starting salaries, thus lowering their loan-to-debt ratio.

# ECONOMIC MOBILITY



Overall, the cohort's economic standing improved at each successive level of education. In 2019, 43.7% of four-year bachelor's degree graduates ranked in the highest income percentile, compared to only 21.4% of high school graduates.

**Figure 15. Percent of the Cohort at Each Income Percentile by Credential Level in 2019**



Source: Kentucky Longitudinal Data System, amounts in 2019 inflation-adjusted dollars.

Figure 15 shows the percentage of the cohort at each income percentile in Kentucky, according to their 2019 median salaries. Only 21% of high school graduates had incomes at or above \$44,422 (the 75th percentile or above), compared to 43.7% of four-year bachelor's degree graduates. Conversely, while 29.3% of high school graduates had median incomes less than \$19,235 (below the 25th percentile), only 9.4% of four-year bachelor's degree graduates did. Overall, the chart illustrates how economic standing improves with each successive level of education. Because five-year and six-year bachelor's degree graduates were in the workforce for fewer years in 2019, they had lower salaries.

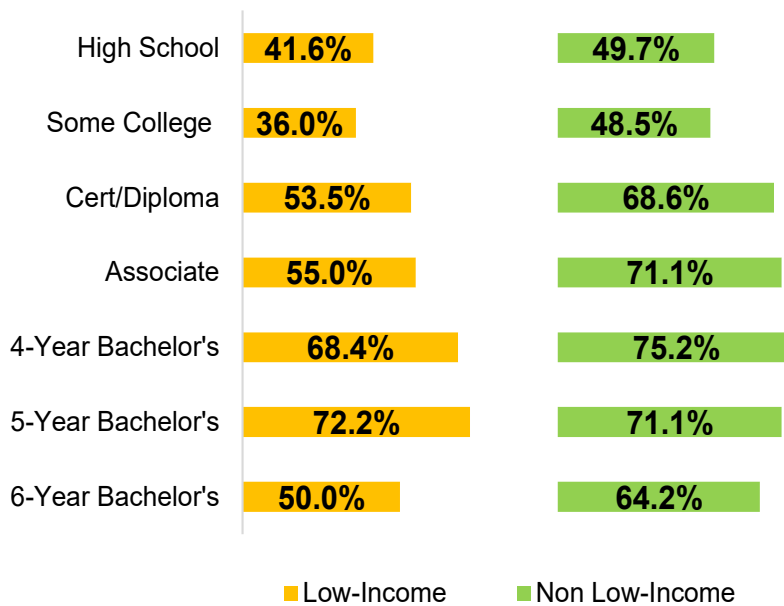


# ECONOMIC MOBILITY



The majority of college graduates in the cohort were in the 50th income percentile or above by 2019. Students from higher income families fared better economically, even at the same education level.

Figure 16. Percent of Cohort Above the 50th Income Percentile in 2019, by Income and Credential Level



Source: Kentucky Longitudinal Data System, amounts in 2019 inflation-adjusted dollars.

Students in the cohort were categorized as low-income based on eligibility for federal free- or reduced-price lunch in high school, a function of their parents' or guardians' income level. In 2019, these same low-income students were independent adults earning a living for themselves and/or their families. Figure 16 shows what percentage of credential earners in the cohort made median annual salaries of \$31,615 or above (placing them in the 50th percentile of Kentucky salaries), based on 2019 earnings. Over half of low-income students with a certificate/diploma (53.5%) were at the 50th income percentile or above in 2019. This percentage rose to 55% for associate earners, 68.4% for four-year bachelor's degree earners, and 72.2% for five-year bachelor's degree earners. However, family economic background as well as education level played a role in future earnings. Students in the cohort who were not low-income were much more likely than low-income students to achieve the 50th income percentile at the same education level.

# TECHNICAL NOTES

The research report was produced by the Council on Postsecondary Education (CPE) and the Kentucky Center for Statistics (KYSTATS) using data from the Kentucky Longitudinal Data System (KLDS). Data sources used in this report include: the Council on Postsecondary Education (CPE), the Kentucky Department of Education (KDE), the Kentucky Longitudinal Data System (KLDS), the Department of Workforce Investment (DWI), Unemployment Insurance (UI), and the National Student Clearinghouse (NSC).

## Cohort Profile, College-Going Rates & College Completion Rates

**Dataset:** The dataset used for the cohort profile includes all students who graduated from a Kentucky high school in 2011.

**Low-income:** This study characterizes students as low-income or non low-income, based on whether they were eligible for free- or reduced-price lunch in high school.

**Underrepresented Minority (URM):** This study defines URM as: (a) Hispanic or Latinx, (b) American Indian or Alaska Native, (c) Black or African American, (d) Native Hawaiian or Other Pacific Islander, or (e) Two or more Races.

**Non-URM:** This study defines non-URM as (a) White, non-Hispanic, (b) Asian, non-Hispanic, or (c) Unknown race, non-Hispanic, or (d) Other race, non-Hispanic.

**College completion:** Students who completed a postsecondary credential in-state or out-of-state.

**Credential Level:** The highest level of education completed by the end of the 2018-19 academic year, which includes

**No college** - High school graduates who did not enroll in college.

**Some college** - Students who enrolled in college but left without a credential or were still enrolled.

**Certificate/diploma** - Students who completed a postsecondary certificate or diploma from a Kentucky public or non-profit private college or university.

**Associate degree** - Students who completed an associate degree from a Kentucky public or non-profit private college or university.

**Bachelor's degree** - Students who completed a bachelor's degree from a Kentucky public or non-profit private college or university.

**Post-bachelor's degree** - Students who completed a post-baccalaureate degree or certificate from a Kentucky

## Cost of Attendance, Grants & Scholarships & Net Cost

**Dataset:** The dataset used in this section of the study includes students from the cohort who enrolled in a Kentucky public postsecondary institution and earned a credential within 1.5 times of the expected time with no private or NSC enrollment by 2019 and no postsecondary enrollment after highest degree completion. Highest credentials at the post-baccalaureate level were also excluded.

**Cost of attendance:** The total cost of attendance (direct and indirect costs) for each student as reported by each institution's financial aid office for the duration of the student's enrollment.

**Grants and scholarships:** The total amount of grants and scholarships received by each student as reported by each institution's financial aid office for the duration of the student's enrollment.

**Net cost:** Net cost was calculated for each student using the total cost of attendance minus the total amount of grants and scholarships.

# TECHNICAL NOTES

**Credential Level:** The highest level of education completed by the end of the 2018-19 academic year, which includes

**Some College** - Students in the cohort who enrolled in a Kentucky public postsecondary institution in the 2011-12 academic year and never earned a postsecondary certificate or diploma during or prior to the 2016-2017 academic year with no postsecondary enrollment in the subsequent years.

**Certificate/diploma** - Students in the cohort who enrolled in a Kentucky public postsecondary institution in the 2011-12 academic year and earned a postsecondary certificate or diploma during or prior to spring 2014.

**Associate degree** - Students in the cohort who enrolled in a Kentucky public postsecondary institution in the 2011-12 academic year and earned an associate degree during or prior to spring 2014.

**Four-year bachelor's degree** - Students in the cohort who enrolled in a Kentucky public postsecondary institution in 2011-12 and earned a bachelor's degree during or prior to spring 2015.

**Five-year bachelor's degree** - Students in the cohort who enrolled in a Kentucky public postsecondary institution in 2011-12 and earned a bachelor's degree during the 2015-16 academic year.

**Six-year bachelor's degree:** Students in the cohort who enrolled in a Kentucky public postsecondary institution in 2011-12 and earned a bachelor's degree during the 2016-17 academic year.

**Disciplines:** The study categorized students into seven disciplines based on their two-digit CIP codes, including arts and humanities, business, education, health, social sciences, STEM, and trades.

## Other notes:

-Missing values for cost of attendance for each student were imputed using the average cost of attendance within the same each institution and academic year.

-Cost of attendance, grants and scholarships, and net cost were all adjusted for inflation using 2019 dollars.

## Loan Borrower's Profile, Total Loan, and Monthly Loan Payment

**Dataset:** The students in this dataset had the same restrictions as those in the Cost of Attendance, Grants & Scholarships & Net Cost section. Additionally, in each academic year, the student was either (a) enrolled in a KY public postsecondary institution, or (b) received non-zero wages covered by unemployment insurance. During the 2019 calendar year, these students must also have received non-zero wages covered by unemployment insurance.

**Loan borrower:** A student at a public institution who was disbursed at least one undergraduate loan from any source (i.e., federal subsidized and unsubsidized, institutional, private, commercial, or other).

**Non-borrower:** A student at a public institution who was not disbursed at least one undergraduate loan from any source (i.e., federal subsidized and unsubsidized, institutional, private, commercial, or other).

**Total loan debt:** Total loan debt included both subsidized and unsubsidized federal, institutional, and other loans. Subsidized loans accrue no interest until six months after the last enrollment in postsecondary education, and unsubsidized loans begin accruing interest at the time of the loan. The study assumed that non-federal loans had the same interest rates as federal unsubsidized loans. Total loan debt was the balance of all loans and interest accrued six months after postsecondary exit. Adjusted for inflation to 2019.

**Monthly loan payment:** Monthly loan repayments were calculated with an amortization period of ten years as suggested by studentaid.gov <https://studentaid.gov/manage-loans/repayment/plans>. The monthly loan payment for each person was the smaller of 10% of 2019 wages and the amortized amount to account for the Revised Pay as You Earn Repayment Plan.

# TECHNICAL NOTES

## Debt-to-Income Analysis

**Debt-to-income ratio:** The debt-to-income ratio is the ratio of total loan debt to a borrower's salary. The annual salary used in this study was entry-level earnings, which is the sum of earnings in the four quarters following postsecondary exit.

## Economic Mobility

Students' income status in this study was based on whether they were eligible for free- or reduced-price lunch in high school, a function of their parents' or guardians' income. Students who were eligible to receive free- or reduced-price lunch were considered low-income, and students who were not eligible to receive free- or reduced-price lunch were considered non low-income.

Students' earnings refers to their 2019 annual earnings. Four percentiles were examined:

- Below 25th (less than \$19,235)
- Between 25th and 50th (\$19,235 to \$31,615)
- Between 50th and 75th (\$31,615 to \$44,422)
- Above 75th (greater than or equal to \$44,422)

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