



HIGHER EDUCATION'S RETURN ON INVESTMENT

The Case for Why Higher Education Matters

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.

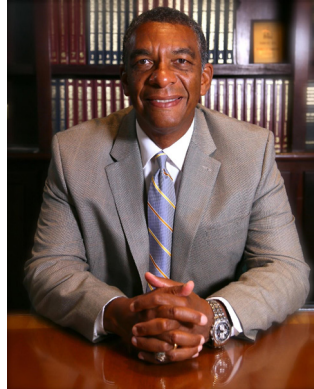
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MESSAGE FROM THE PRESIDENT

Dr. Aaron Thompson



As president of the Council on Postsecondary Education, I have made it my mission to remind Kentuckians why higher education matters. While plenty of people still believe college is the gateway to the middle class, rising tuition and loan debt and stagnating wages have eroded the public's confidence in higher education.

The Council is committed to providing accurate and transparent data on the true cost and value of college in Kentucky. This report examines higher education's return on investment for both the individual student and the state as a whole. To the extent possible, we have focused on one cohort of students - the Kentucky high school class of 2010 - which we followed for eight years (from their entry into college or the workforce in 2010 to 2018, the most recent year of data available).

These findings should dispel any doubts about the value of a college credential. Kentucky's high school class of 2010 paid about \$55,000 total for a bachelor's degree at an in-state public university; an associate degree was less (about \$30,000). While we often hear about college graduates with upwards of \$100,000 in student loan debt for all expenses associated with college, the average Kentucky undergraduate student borrowed just over \$30,000 for a four-year degree and \$15,000 for a two-year degree, about what you'd borrow for a new or used car. Around 40% of in-state college-goers in the cohort did not borrow at all.

This is not to minimize the very real concerns students and families have about college affordability. But compared to the published price of college for a Kentucky resident (about

\$80,000 for a bachelor's degree at a public university and \$45,000 for an associate degree at KCTCS), these actual costs may come as a surprise.

College graduates from the class of 2010 realized a return on their investment even a few years after graduation. By 2018, bachelor's degree graduates were making \$12,000 more annually than high school graduates, and associate degree graduates were making \$8,000 more. Over a lifetime, a bachelor's degree graduate earns \$1.2 million more than a high school graduate, 26 times the initial investment.

For the state, the return on investment is even greater.

Kentucky invests about \$41,000 for each public bachelor's degree graduate through state financial aid and direct appropriations to public institutions. In return, that graduate contributes \$1.7 million to the economy through taxes and spending over a lifetime - more than 40 times the initial investment. The state's total investment in the cohort (\$630 million) yields \$43.8 billion in revenue, which is 69 times the initial investment.

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There is no better
investment in
Kentucky's workforce
& economy than
higher education.”**

I would like to thank the Kentucky Center for Statistics for their contributions to this report, which shows there is no better investment in Kentucky's workforce and economy than higher education. Making our colleges and universities more accessible and affordable is the best way to advance our Commonwealth and its most important resource - its people.

EXECUTIVE SUMMARY: KEY TAKEAWAYS

FOR THE STUDENT:

- **The total out-of-pocket (net) cost of a public postsecondary credential is significantly lower than the published (sticker) price.** On average, students from the high school class of 2010 paid a total of \$15,394 for a certificate or diploma, \$30,859 for an associate degree, and \$55,418 for a bachelor's degree. The published cost of attendance (tuition, fees, room and board, books, and travel expenses) is \$21,039, \$44,881, and \$79,217 respectively.
- **About a third of the total cost of public postsecondary credentials is covered by grants and scholarships.** State and federal grants and scholarships subsidized 27%-31% of the total cost of a credential. This is money that does not need to be paid back. Nearly all degree graduates in the cohort (98%) received some amount of financial aid.
- **Tuition and fee increases at Kentucky's public institutions are at their lowest point in 15 years.** There is a perception that tuition is skyrocketing, but the Council on Postsecondary Education has worked hard to moderate increases through its tuition-setting policies. Tuition and fees rose just 2.2% in the current academic year, about the same as inflation.
- **A substantial number of students do not borrow loans to finance their education.** Forty-one percent of the cohort who attended an in-state public postsecondary institution accrued zero loan debt during the course of their studies.
- **The median student loan debt is comparable to an auto loan, except a credential, unlike a car, appreciates in value.** The median loan amount (principle and interest) was \$9,787 for a certificate/diploma, \$15,472 for an associate degree, and \$32,855 for a bachelor's degree.
- **At the end of 8 years, college graduates were earning significantly more than high school graduates - \$12,000 more for a bachelor's degree and \$8,000 more for an associate degree.** A limitation of this research design is the inability to track median salaries for a longer period of time, when differences would be more pronounced. Even so, college graduates at every level were making more than high school graduates by 2018, and the differences in inflation-adjusted entry-level salaries were even greater.

- **In Kentucky, higher education still pays.** Over a working lifetime, a bachelor's degree graduate earns \$1.2 million more than high school graduate, even after taking opportunity cost (lost earnings potential while in college) into account. This is 26 times the investment. Associate degree graduates earn \$422,000 more once opportunity cost is considered.

FOR THE STATE:

- **Kentucky invested about \$544 million in the class of 2010 through direct appropriations to public colleges and universities.** Most of the state's investment in public higher education is direct funding to colleges and universities for operational expenses (called net General Fund appropriations). On a per student basis, this amount averaged from about \$6,600 to \$7,000 for the cohort. In 2018, net General Fund per FTE student had fallen to \$5,941.
- **Kentucky invested about \$86 million in the class of 2010 through state financial aid programs by virtue of Kentucky lottery proceeds.** Kentucky is a high-aid state due to the success of its lottery program. KEES, a merit-based scholarship, and CAP, a need-based grant, account for 85% of all aid disbursed to students.
- **The state's return on investment for college-goers in the high school class of 2010 is 69 times the initial investment.** The state's total investment for public college-goers in the cohort was \$630M. In return, these students will contribute \$43.8 billion to the economy over a working lifetime (ages 18-64) through taxes and spending.
- **College graduates are much less likely to be unemployed or participate in entitlement programs, resulting in additional savings.** Although difficult to quantify, college-educated residents save the state money through decreased reliance on social welfare programs and unemployment insurance. In 2017, 85% of the individuals who were unemployed or out of the labor force did not have a college credential. People without a college credential accounted for 88% of SNAP recipients, 86% of Medicaid recipients, and 94% of SSI (disability) recipients.

RETURN ON INVESTMENT FOR STUDENTS



This is the story of one cohort of students - the Kentucky high school class of 2010. This report tracks 42,856 students who graduated from a Kentucky high school in 2010 until 2018, the most recent year of data available.

Over half of these students entered an in-state college or university directly from high school. Another 5,000 had enrolled in college by 2018. All in all, 13,576 (32%) completed a postsecondary credential, and 1,709 were still enrolled at the end of eight years.

Of grave concern is the number of students who never went to college (13,831) or left college without a credential (13,740).

Almost two-thirds of the cohort (64%) had earned only a high school diploma by the end of 2018. This is not good news for Kentucky's long-term economic prospects. On average, these students earn less money and are significantly more likely to be unemployed or receiving government assistance. Of the individuals who received

unemployment benefits in 2017, 85% did not have a college credential.

The students who did earn a postsecondary degree were making significantly more money than high school graduates at the end of eight years - about \$12,000 more for a

bachelor's degree and \$8,000 more for an associate degree. These differences grow even more pronounced over time, as degree holders are more likely to be promoted to managerial or leadership positions within their organizations.

Salary estimates from the American Community Survey show that over an entire career, bachelor's degree holders in Kentucky earn \$1.2 million

more than high school graduates, and associate degree holders earn \$422,000 more. This more than offsets their investment in the degree, even when lost earning potential is taken into account. A bachelor's degree graduate will make 26 times the investment, while an associate degree graduate will make 40 times the investment.

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This is the story of one cohort of students - the Kentucky high school class of 2010.

**KENTUCKY'S
HIGH
SCHOOL
GRADUATING
CLASS OF 2010**

**CLASS SIZE:
42,856**

**AVERAGE GPA:
2.84**

**AVERAGE ACT:
19.4**

*English: 18.9
Math: 19.1
Reading: 19.7
Science: 19.5*

**ATTENDED KY
COLLEGE
DIRECTLY FROM
HIGH SCHOOL:**

**24,056
(56%)**

**ATTENDED
COLLEGE WITHIN
8 YEARS:**

**29,025
(68%)**

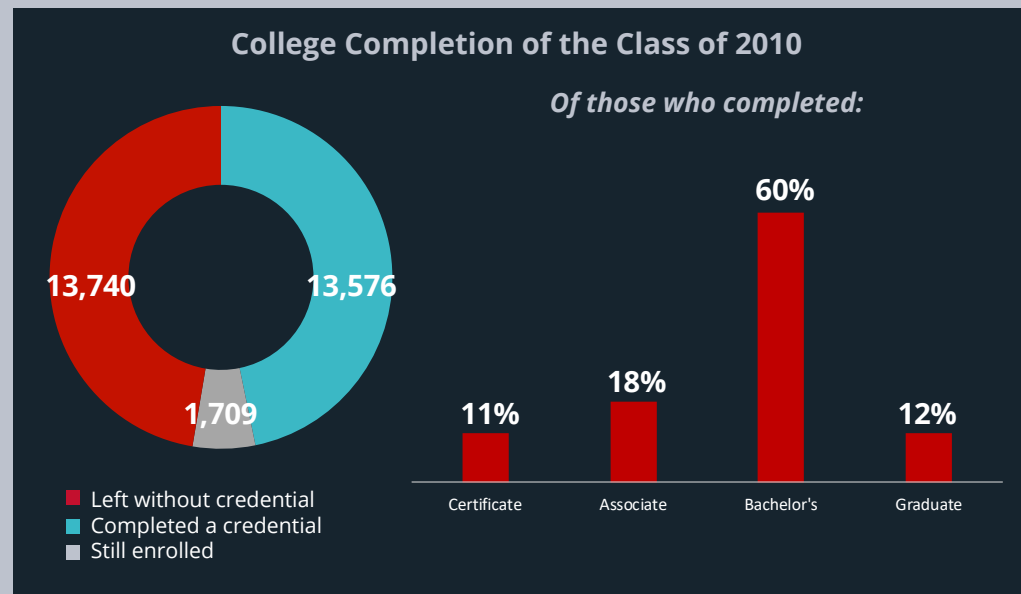
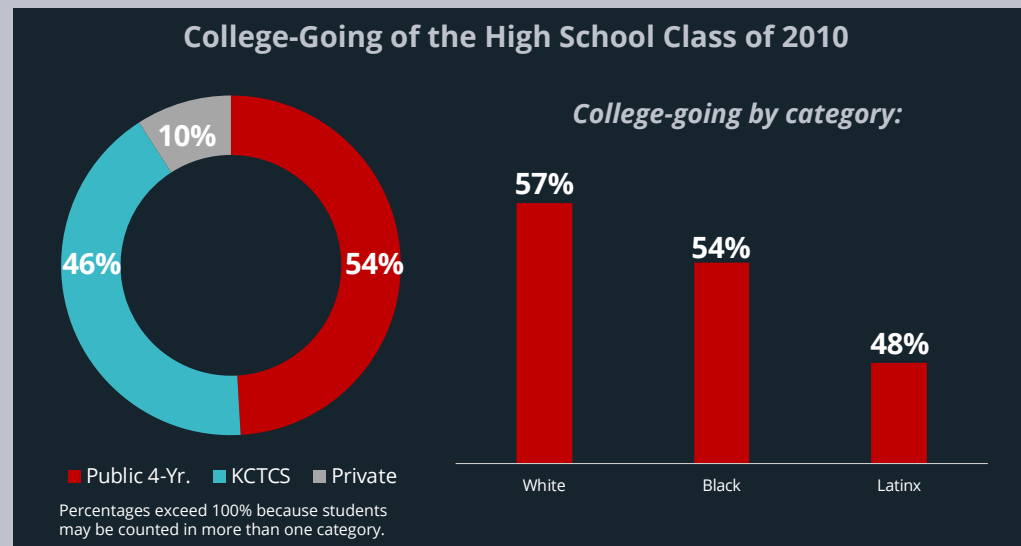
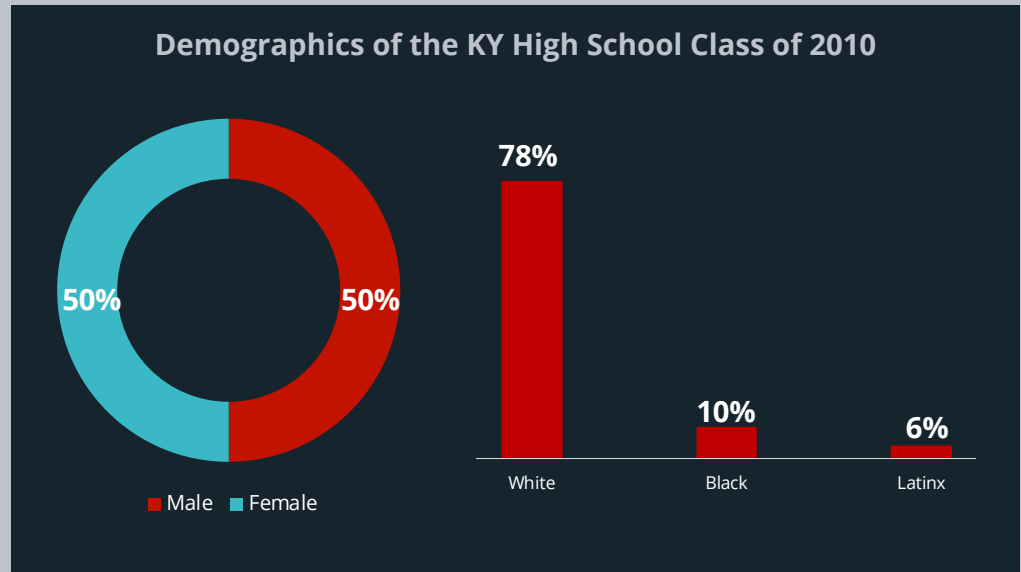
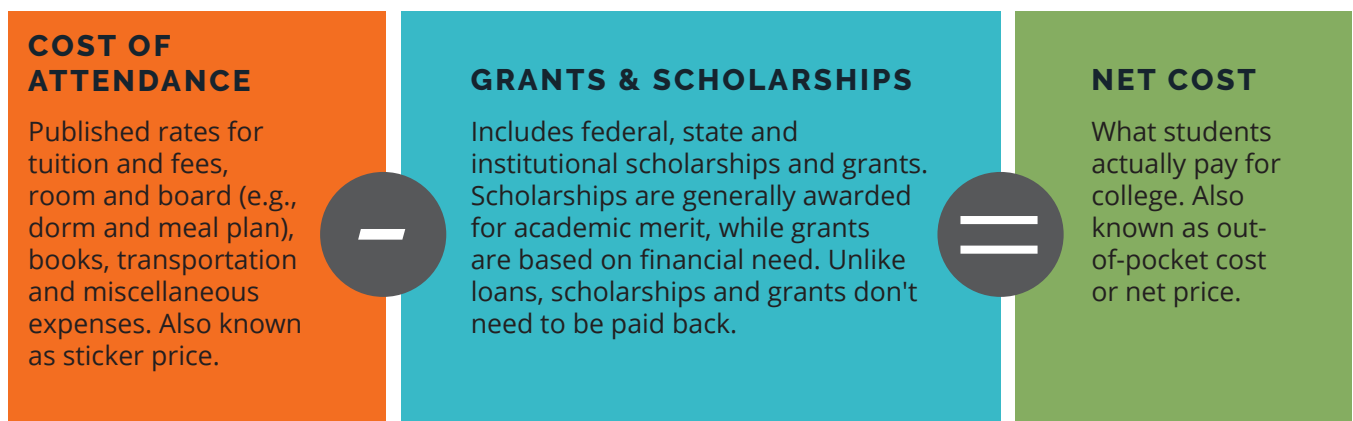


FIGURE 1. **TOTAL NET COST FOR THE CLASS OF 2010 (FROM ENTRY TO 2018)**

KEY TAKEAWAY: The total out-of-pocket cost of a public postsecondary credential was significantly lower than the published price.

Credential Level	Median Years to Degree	TOTAL (2010-2018)			
		Median Cost of Attendance	Median Grants & Scholarships	Net (Out-of-Pocket) Cost	Percent Funded by Aid
Certificate/Diploma	2	\$21,039	\$5,645	\$15,394	27%
Associate	4	\$44,881	\$14,022	\$30,859	31%
Bachelor's	5	\$79,217	\$23,799	\$55,418	30%

Source: KPEDS & Integrated Postsecondary Education Data System (IPEDS)



Many students and families overestimate the cost of a public postsecondary credential in Kentucky. This is partly due to the federal methodology higher education institutions use to determine total cost of attendance, or their published sticker price. Cost of attendance includes both direct costs, like tuition and fees, as well as indirect costs, like housing, food and transportation to and from campus. **Most indirect costs are within a student's control and can be significantly less than the college estimates.** For example, students can reduce indirect costs by living at home, renting textbooks or buying used ones, or, if they live on campus, purchasing a less expensive meal plan or traveling home less frequently. The amounts in the table above represent the average cost of attendance at KCTCS and public universities based on the federal calculation.

Additionally, students and families often fail to take financial aid into account. The grants and scholarships column (in blue) shows the median aid amount students in the high school class of 2010 received; this is money that does not need to be paid back. The amount received from federal and state grants and scholarships covered about a third of the total cost. Grants and scholarships brought the total cost of a certificate or diploma down to \$15,394, an associate degree down to \$30,859, and a bachelor's degree down to \$55,418. **Nearly all degree graduates in the cohort (98%) received some amount of financial aid.**

Another factor driving total cost is time to degree. The median time to degree for the class of 2010 was 2 years for a certificate/diploma, 4 years for an associate degree, and 5 years for a bachelor's degree. Completing a credential in less time is one of the best ways to lower out-of-pocket costs.

FIGURE 2. **TOTAL NET COST, BY CREDENTIAL & DISCIPLINE**

KEY TAKEAWAY: About a third of the total cost of most public postsecondary credentials was covered by grants and scholarships.

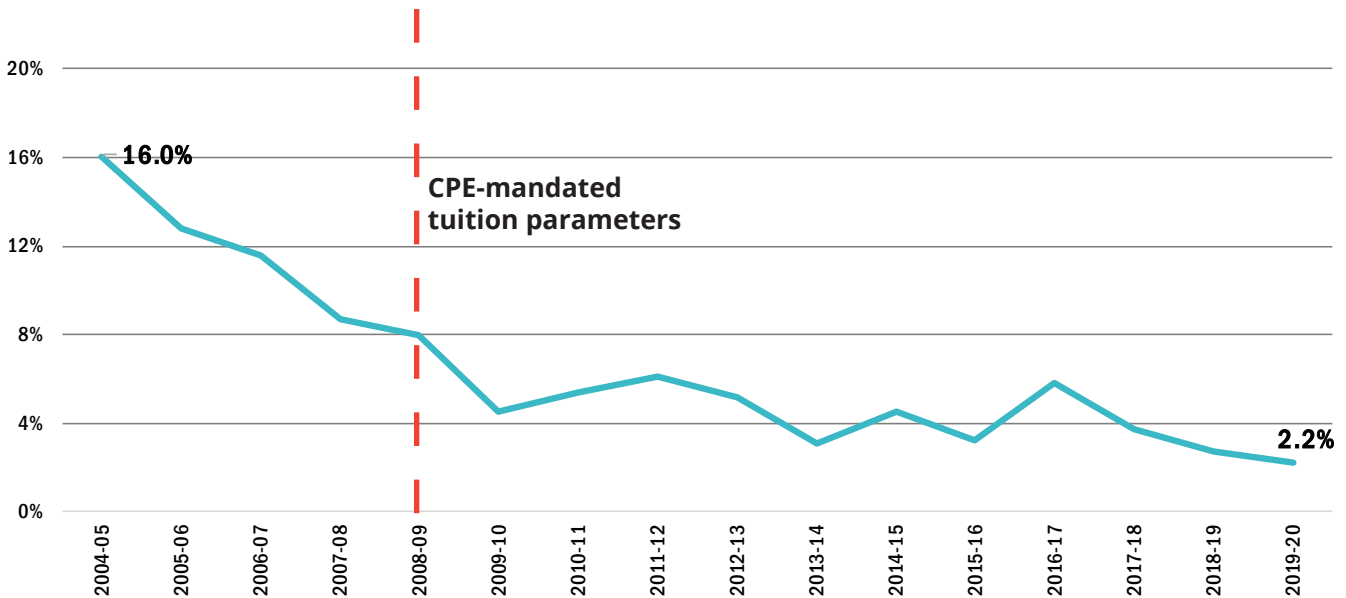
		Certificate/Diploma				
Discipline	Median Years to Degree	Total Cost of Attendance	Total Grants & Scholarships	Total Net (Out-of-Pocket) Cost	Percent Funded by Aid	
Business	4	\$36,858	\$8,626	\$28,232	23%	
Health	2	\$19,934	\$5,509	\$14,425	28%	
STEM	3.25	\$22,321	\$6,159	\$16,162	28%	
Social Sciences	2	\$28,360	\$8,383	\$19,977	30%	
Trades	2	\$17,629	\$5,023	\$12,606	28%	
		Associate				
Discipline	Median Years to Degree	Total Cost of Attendance	Total Grants & Scholarships	Total Net (Out-of-Pocket) Cost	Percent Funded by Aid	
Arts/Hum.	4	\$43,812	\$13,909	\$29,903	32%	
Business	4	\$44,881	\$14,296	\$30,585	32%	
Health	5	\$53,239	\$16,217	\$37,022	30%	
Social Sciences	5	\$56,720	\$22,931	\$33,789	40%	
STEM	4	\$33,661	\$11,359	\$22,302	34%	
Trades	3.5	\$33,731	\$9,331	\$24,400	28%	
		Bachelor's				
Discipline	Median Years to Degree	Total Cost of Attendance	Total Grants & Scholarships	Total Net (Out-of-Pocket) Cost	Percent Funded by Aid	
Arts/Hum.	5	\$82,227	\$27,618	\$54,609	34%	
Business	4.5	\$77,694	\$17,970	\$59,724	23%	
Education	4.5	\$83,208	\$22,469	\$60,739	27%	
Health	5	\$78,274	\$25,435	\$52,839	32%	
Social Sciences	4.5	\$83,402	\$25,074	\$58,328	30%	
STEM	4.5	\$74,954	\$27,265	\$47,689	36%	
Trades	4.5	\$74,806	\$20,775	\$54,031	28%	

Source: KPEDS & Integrated Postsecondary Education Data System (IPEDS)

These graphs provide a more granular look at total net cost by credential and discipline. Grants and scholarships subsidized a sizable portion of the total cost, from a low of 23% for a certificate in business to a high of 40% for an associate degree in the social sciences. There is less variance in total net cost at the bachelor's degree level than at the associate level and below. Dollar amounts for arts/humanities and education at the certificate/diploma level, as well as education at the associate level, were suppressed due to small sample sizes.

FIGURE 3. **ANNUAL TUITION & FEE INCREASES AT PUBLIC INSTITUTIONS**

KEY TAKEAWAY: Tuition and fee increases at Kentucky's public institutions are at their lowest point in 15 years.

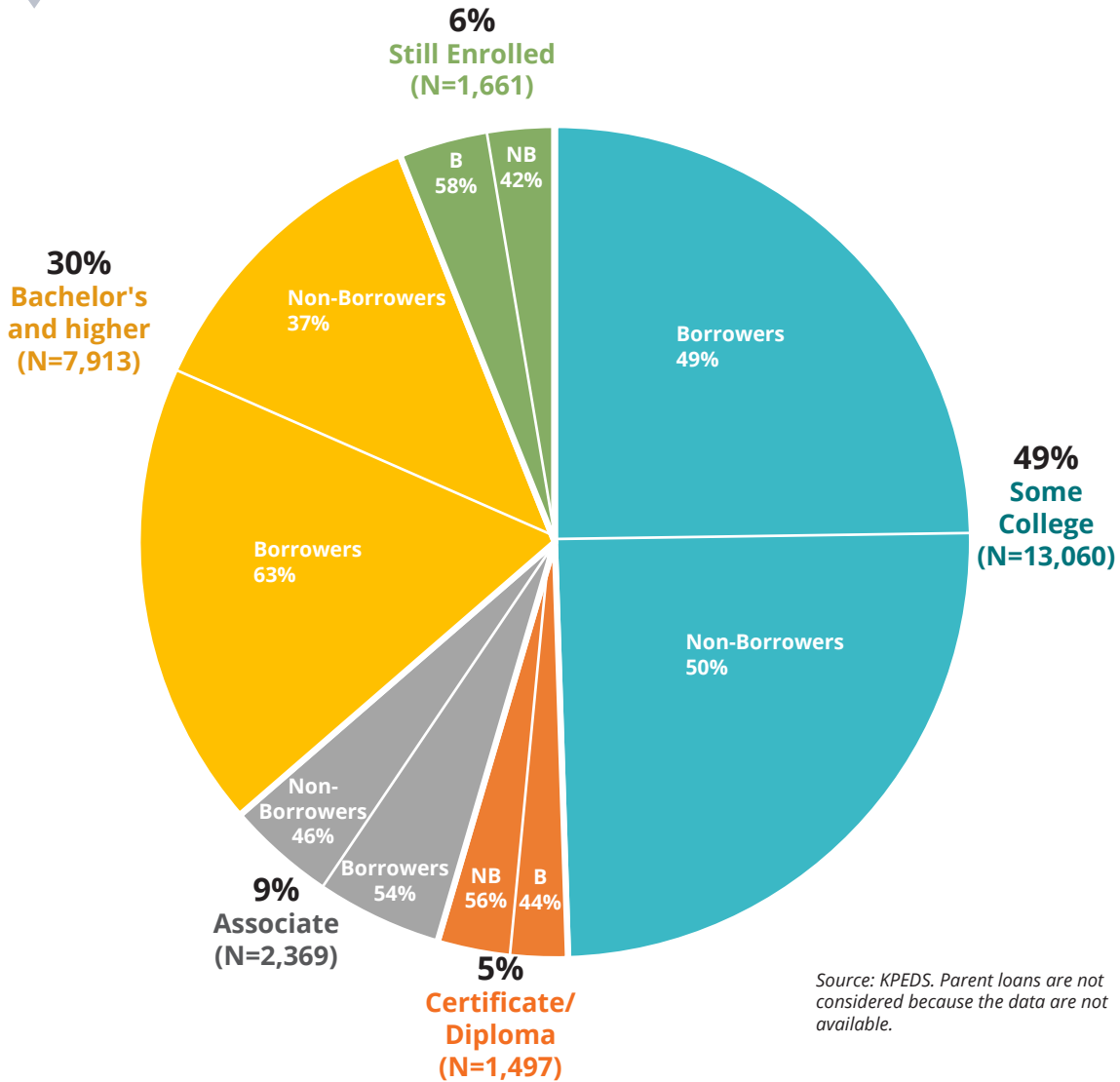


Source: Kentucky Council on Postsecondary Education

There is a perception that college costs are skyrocketing, with double or triple-digit tuition increases each year. In truth, tuition increases have moderated over the last several years. In 2008-09, the Council on Postsecondary Education began setting tuition ceilings for KCTCS and public universities. Following this change, tuition increases slowed dramatically and are now in line with inflation. In the current academic year, tuition and fees rose just 2.2%, the lowest increase in 15 years.

FIGURE 4. **BORROWERS IN THE CLASS OF 2010 (PUBLIC INSTITUTIONS ONLY)**

KEY TAKEAWAY: 41% of students in the cohort attending a public college or university did not borrow loans to finance their education.

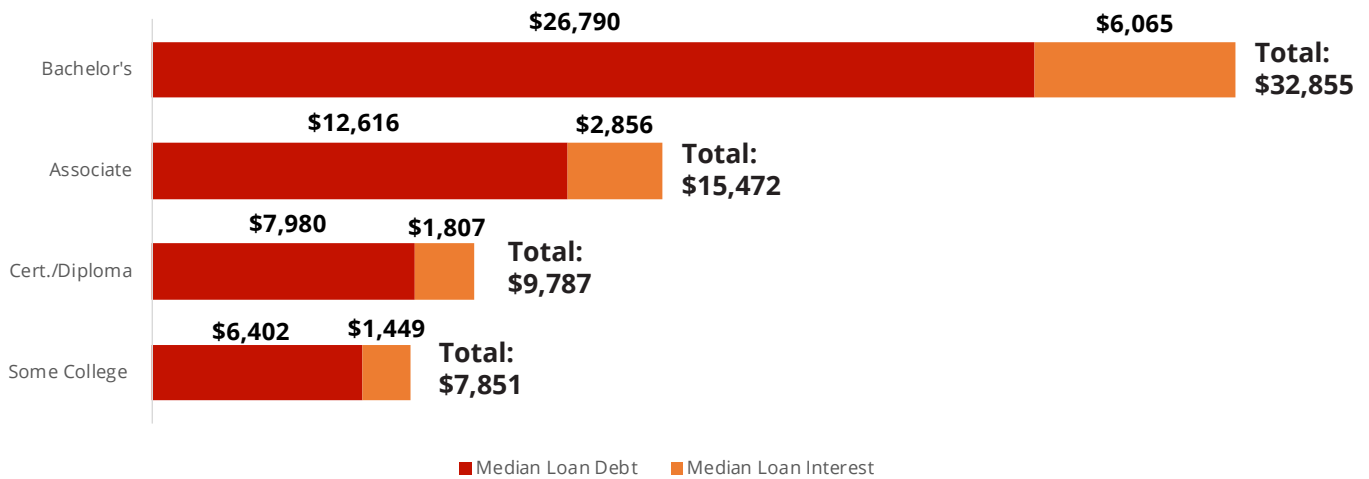


Although we hear a lot about rising student loan debt in the media, not everyone borrows to finance their education. Among the class of 2010, 56% of certificate/diploma earners (838 students), 46% of associate degree earners (1,090 students) and 37% of bachelor's or graduate degree earners (2,928 students) at a public college or university accrued zero loan debt over the course of their studies. This means 4,856 of the 11,779 students in the cohort who earned a degree at a public institution (41%) did not borrow any student loans during the course of their studies.

A concern is the 6,529 students who borrowed for college and left before completing a degree. These students are much more likely to default on their loans. Although it seems counterintuitive, students with less than \$5,000 of loan debt are more likely to default than students who owe upwards of \$20,000. This is because students with higher loan debt usually complete a bachelor's degree or higher, earn higher salaries, and are better able to afford their payments.

FIGURE 5. MEDIAN LOAN DEBT & INTEREST FOR THE CLASS OF 2010 (FROM ENTRY TO 2018, ATTENDING PUBLIC UNIVERSITIES ONLY)

KEY TAKEAWAY: The median student loan amount was comparable to an auto loan, except a credential, unlike a car, appreciates in value.

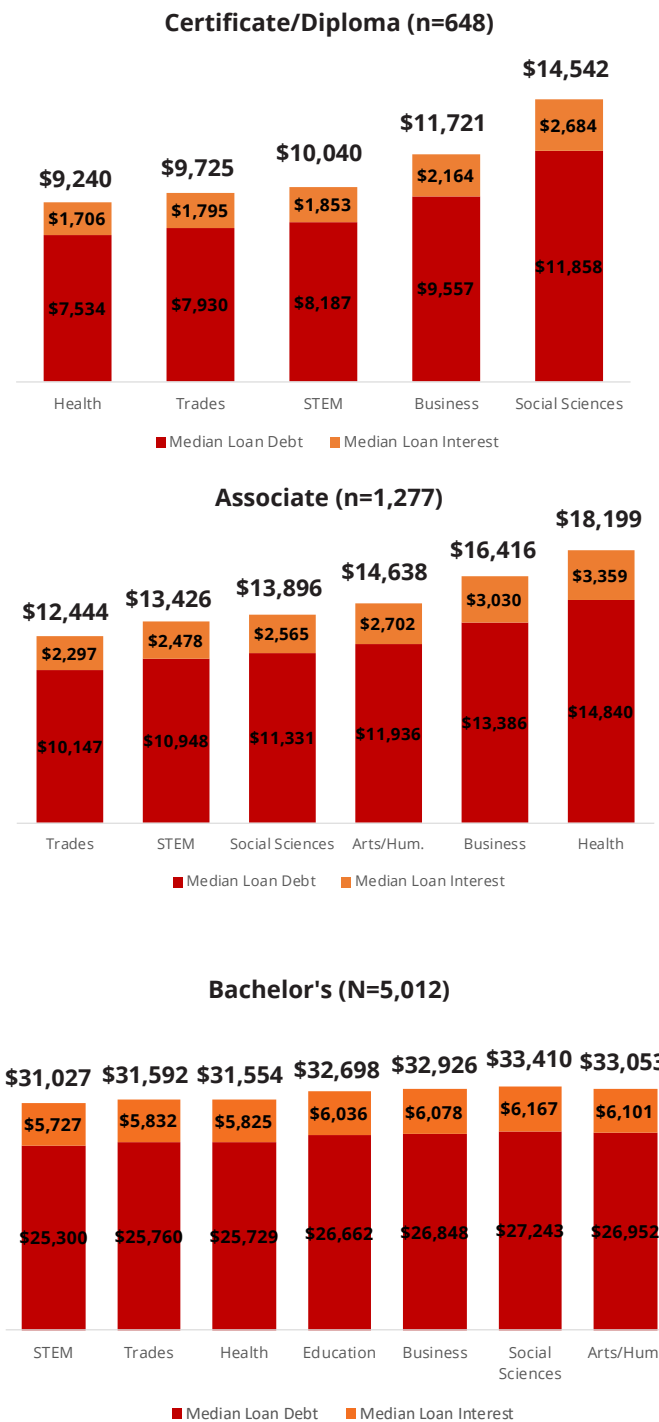


Source: KPEDS and U.S. Department of Education Repayment Calculator

Anecdotes about students with \$100,000 or more in student loan debt do not reflect the typical undergraduate experience at an in-state public institution. The median loan debt accrued by an associate degree holder in the class of 2010 was comparable to the price of a new economy car (a 2019 Ford Fiesta lists for about \$15,000). The typical bachelor's degree holder owed just over \$30,000, about the price of a new Ford Explorer. Unlike a car, which depreciates over time, a college credential appreciates in value.

In this calculation, interest was estimated using a federal financial aid calculator based on a standard repayment plan with fixed monthly rates for a period of 10 years (nationally, just under half of students choose this option). These dollar amounts reflect the median of borrowers only (8,036 students), not all students in the cohort who earned a credential (13,576). Loan amounts were calculated for borrowers attending public postsecondary institutions only, since financial aid files for private institutions were not available.

FIGURE 6. **MEDIAN LOAN DEBT & INTEREST, BY CREDENTIAL & DISCIPLINE**

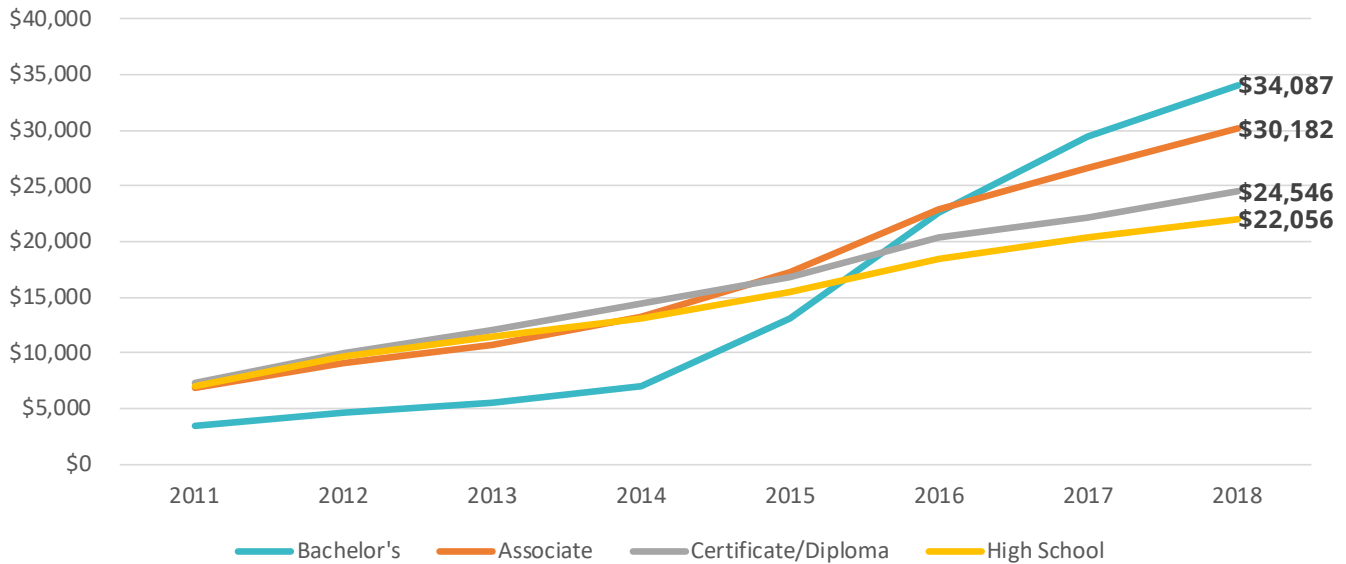


Source: KPEDS and U.S. Department of Education Repayment Calculator

These graphs look at median loan debt and interest by credential and discipline. There is less variance in loan amounts at the bachelor's degree level than at the associate and certificate/diploma level. Differences in loan debt are influenced by the amount of time it takes to earn a degree or certificate in those disciplines; finishing a credential in less time leads to significantly lower debt amounts. Loan amounts for certificates/diplomas in arts/humanities and education, as well as associate degrees in education, were suppressed due to small sample sizes.

FIGURE 7. **MEDIAN ANNUAL EARNINGS OF THE CLASS OF 2010 (2011-18)**

Key Takeaway: Bachelor's degree graduates earned \$12,000 more annually than high school graduates in 2018, despite having less full-time work experience. Associate degree graduates earned \$8,000 more.



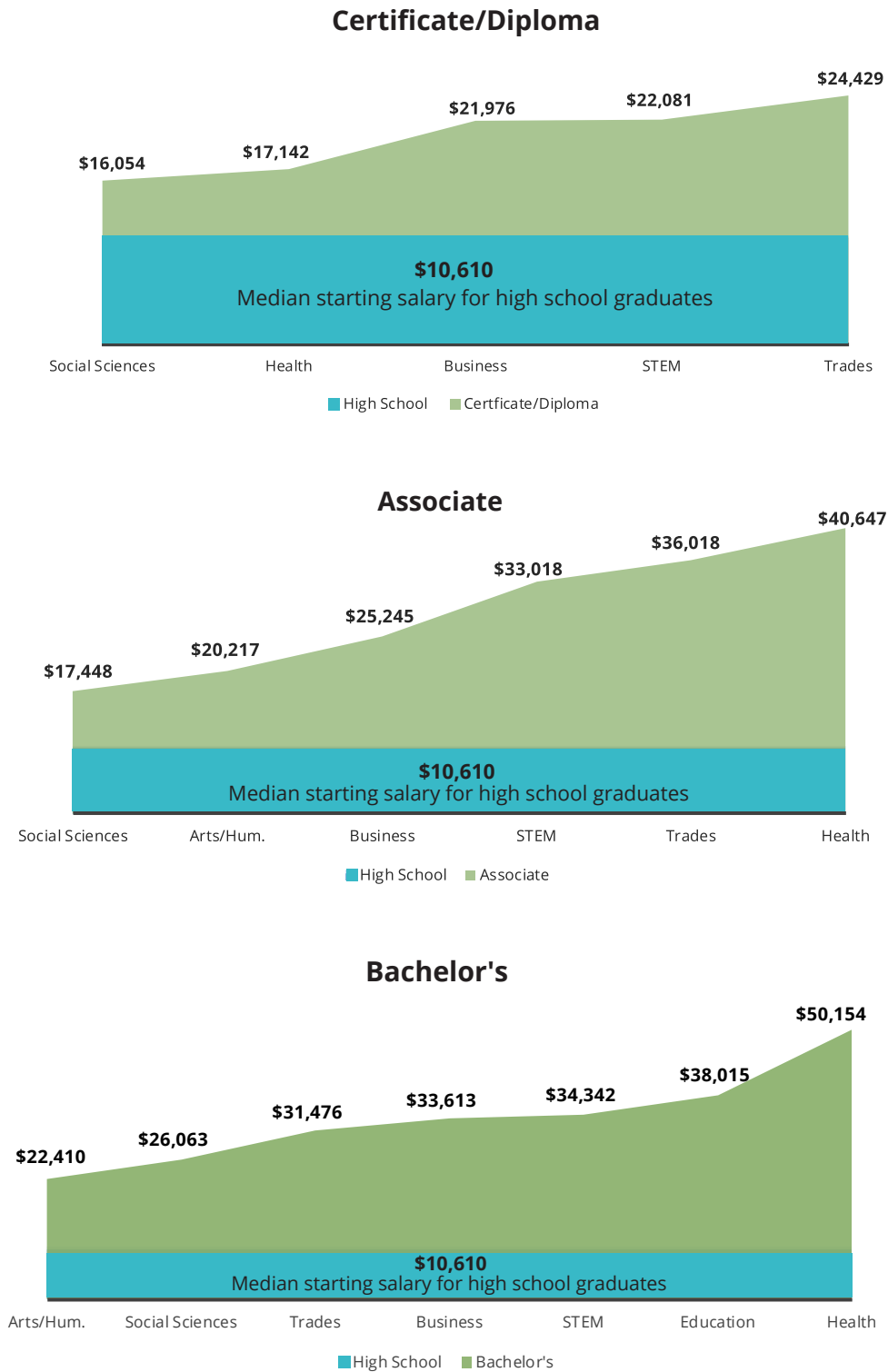
Source: KYSTATS & Unemployment Insurance Data

Initially, high school graduates in the cohort worked and earned more than associate and bachelor's degree seekers. (Certificate/diploma seekers earned more than high school graduates in every year of the study.) However, once degree graduates began entering the workforce (from the middle of 2015 on), their earnings surpassed those of high school graduates. By the end of 2018, bachelor's degree graduates were earning \$12,000 more annually than high school graduates, and associate degree graduates were earning \$8,000 more.

This comparison actually understates the earning power of a college degree, because it compares the entry-level salaries of college completers to a high school graduate's salary after eight years of experience. Looking at the median entry-level salary at each credential level provides a more "apples to apples" comparison. Figure 8 compares starting salaries (defined as two years after earning the credential) by level and discipline, in 2018 constant dollars.

This study ends in 2018, but Census data show that college graduates experience greater income growth over the course of their careers. Thus, these wage differentials will grow even more pronounced over time.

FIGURE 8. MEDIAN ENTRY-LEVEL EARNINGS (TWO YEARS AFTER COMPLETION), BY CREDENTIAL & DISCIPLINE



Source: KYSTATS & Unemployment Insurance Data

These graphs compare median starting salaries for the class of 2010 by discipline, defined as two years after receiving a credential. All salaries have been adjusted for inflation and are in 2018 constant dollars. In general, individuals majoring in health, STEM, and trades earned higher starting salaries than individuals majoring in the arts and humanities and social sciences, although numerous national studies have shown these differences narrow over time. Amounts for education at the certificate/diploma and associate level, as well as health at the certificate/diploma level, were redacted due to small sample sizes.

FIGURE 9. MEDIAN OPPORTUNITY COST OF GOING TO COLLEGE (IN LOST WAGES)

Education Level	2011		2012		2013		2014		2015		2016		Total Opp. Cost
	Wages	Diff.	Wages	Diff.	Wages	Diff.	Wages	Diff.	Wages	Diff.	Wages	Diff.	
H.S.	\$6,959		\$9,703		\$11,522		\$13,079		\$15,496		\$18,496		\$0
Cert./Dip.	\$7,245	\$286	\$9,944	\$241	\$12,055	\$533	\$14,424	\$1,345	\$16,740	\$1,244	\$20,313	\$1,817	\$0
Associate	\$6,894	-\$65	\$9,037	-\$666	\$10,686	-\$836	\$13,239	\$160	\$17,288	\$1,792	\$22,884	\$4,388	\$1,567
Bachelor's	\$3,423	-\$3,536	\$4,590	-\$5,113	\$5,530	-\$5,992	\$6,978	-\$6,101	\$13,051	-\$2,445	\$22,601	\$4,105	\$23,187

Source: KYSTATS & Unemployment Insurance Data

For the purposes of this report, opportunity cost is the amount of money students could have earned had they worked full-time instead of going to college (lost earnings potential while enrolled in college). Figure 9 compares the median annual salary at each credential level against the median annual salary of high school graduates in the cohort. The difference is expressed as either a negative (in red) or positive (in green) number. To arrive at the total opportunity cost, all negative amounts are totaled. (Wage differentials for 2017 and 2018 were excluded because they didn't contribute to the total opportunity cost.) The opportunity cost for a degree at KCTCS was negligible (\$1,567). For a bachelor's degree, it was \$23,187, less than the entry-level salary for that group. The median wage for certificate and diploma seekers in the cohort was higher in every year of the study, suggesting that students seeking these credentials were working full-time in more skilled occupations even while enrolled.

There are several surprising facts this table highlights. First, the median annual salary for high school graduates in the class of 2010 was under \$20,000 for all but two years of the study (2017 and 2018), not much higher than the poverty level for a family of four. There may be some high school graduates who are earning more, but they are the exception, not the rule. Second, as a whole, college students in the cohort were earning money even during their college years. Even bachelor's degree seekers, who are more likely to attend full-time, earned between \$3,423 and \$6,978 while enrolled.

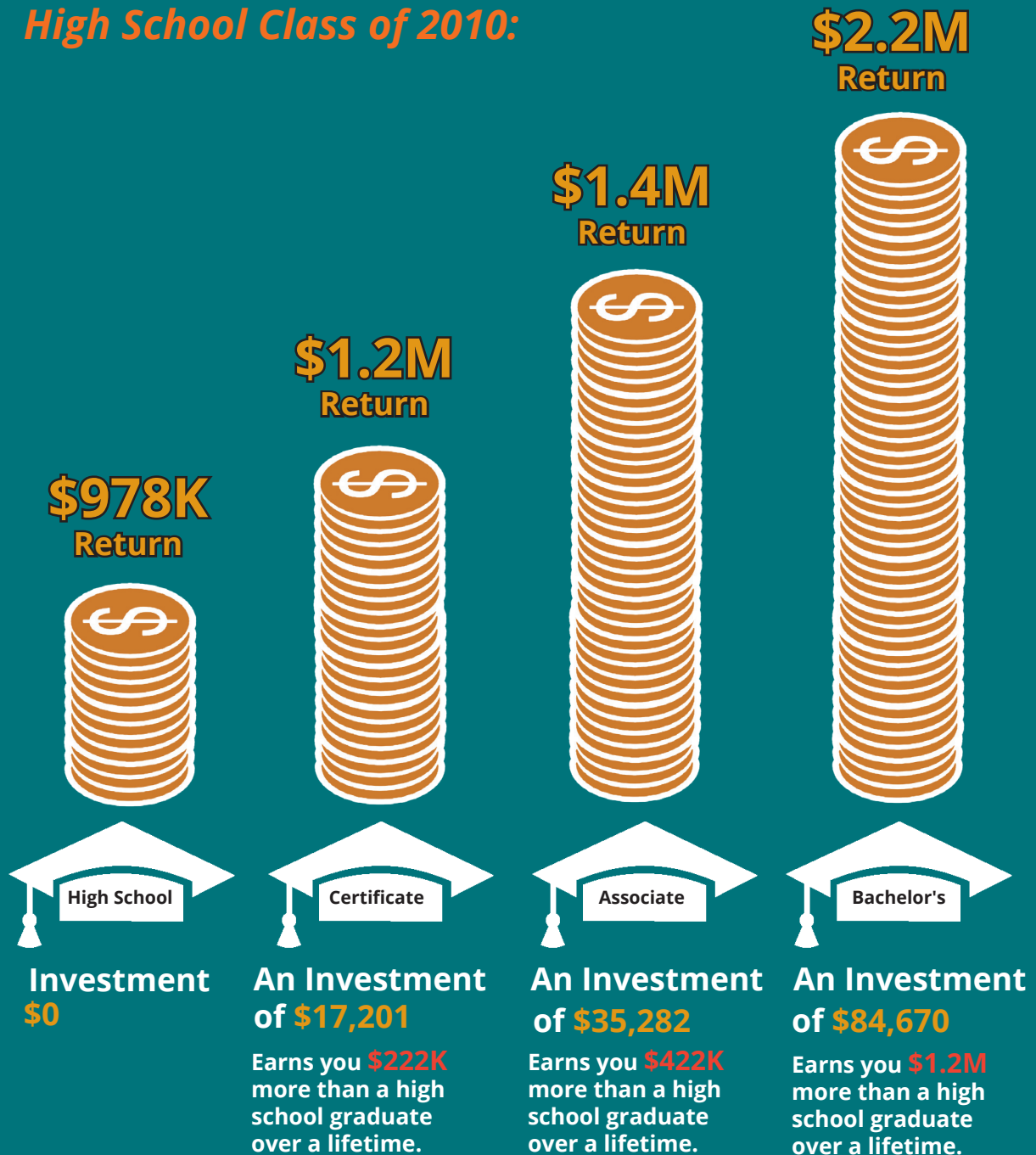
FIGURE 10. MEDIAN TOTAL COLLEGE INVESTMENT

Credential Level	THE MEDIAN INVESTMENT (2010-2018)			
	Total Net Cost	Opportunity Cost (Lost Earnings)	Student Loan Interest	Total Investment
Certificate/Diploma	\$15,394	\$0	\$1,807	\$17,201
Associate	\$30,859	\$1,567	\$2,856	\$35,282
Bachelor's	\$55,418	\$23,187	\$6,065	\$84,670

A true investment amount takes into account total out-of-pocket (net) cost as well as the income lost as a result of going to school (opportunity cost). Figure 10 sums the total net and opportunity cost and loan interest at each credential level to arrive at a total median investment for the cohort from 2010-18. Figure 11 (next page) uses Census data to project the median lifetime earnings for Kentuckians at each credential level, which illustrates a student's return on investment over a working lifetime (ages 18-64).

FIGURE 11. **AVERAGE RETURN ON INVESTMENT OVER A LIFETIME**

*For a Student in the
High School Class of 2010:*



Investment includes net cost of college, loan interest, and opportunity cost (lost wages while in college)

Source: Salary estimates are from the 2017 American Community Survey (ACS), 1-Year Kentucky Public Use Microdata Sample (PUMS). ACS does not include salary data for certificate holders, so data for "some college" was substituted.

RETURN ON INVESTMENT FOR THE STATE



While the previous section dealt with higher education's return on investment for individual students, this section explores the state's return on public higher education expenditures - more specifically, the funding allocated to state financial aid programs and public colleges and universities (General Fund appropriations).

Since 2010, the state has reduced General Fund appropriations for public colleges and universities by 18%, forcing institutions to cut costs and raise revenue. Over time, these reductions have shifted more of the financial responsibility for college onto students and their families. As a result, our public institutions have become less affordable.

However, investments in public higher education more than pay for themselves. Kentucky invested about \$544 million in the cohort through state General Fund appropriations, and another \$86 million in financial aid, which is funded by lottery proceeds.

In exchange for this \$630 million investment, the Kentucky high school class of 2010 will contribute \$43.8 billion to the state economy through taxes and spending over a lifetime. That's 69 times the initial investment. For every \$41,000 the state invests in a bachelor's degree graduate, \$1.7 million is returned to the economy - 42 times the initial investment.

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For every \$41,000 the state invests in a bachelor's degree graduate, \$1.7 million is returned to the economy.

Additionally, college graduates are much less likely to receive unemployment insurance or participate in entitlement programs. In 2017, 85% of the individuals who were unemployed or out of the labor force did not have a college credential. People without a college credential accounted for 88% of SNAP recipients, 86% of Medicaid recipients, and 94% of SSI (disability) recipients.

Expanding access to higher education and providing supports to increase graduation rates not only expands opportunity for residents, it strengthens the state's workforce. Increasing education funding is one of the most solid investments we can make in the economic well-being of the Commonwealth.

FIGURE 12. NET GENERAL FUND INVESTMENT IN THE CLASS OF 2010 (PUBLIC INSTITUTIONS ONLY)

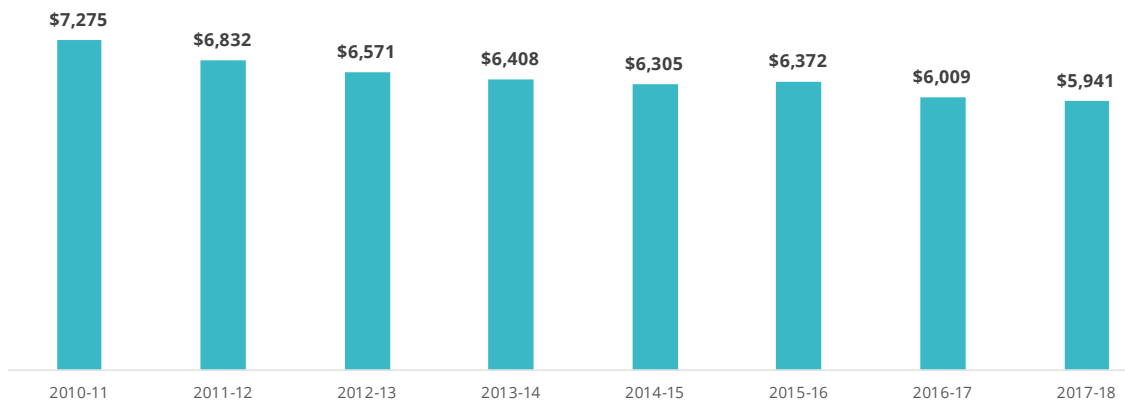
Key Takeaway: The state of Kentucky invested \$544 million in the cohort through direct appropriations to public institutions.

High School Class of 2010 (2010-18)					
Credential Level	Average Net GF Appropriation per FTE Student	Median Time to Degree	Total Net GF Appropriation per FTE Student	Number of Students in the Cohort	Total Net GF Investment in the Cohort, by Level
Some College	\$7,054	2	\$14,108	13,060	\$184M
Certificate/Diploma	\$7,054	2	\$14,108	1,497	\$21M
Associate	\$6,772	4	\$27,088	2,369	\$64M
Bachelor's	\$6,678	5	\$33,390	6,768	\$226M
Graduate	\$6,580	6.5	\$42,770	1,145	\$49M
					\$544M

The net General Fund appropriation per full-time equivalent student is the standard method used to estimate the state's per student funding for public higher education institutions. The calculation takes into account all students enrolled at KCTCS and the public universities in the fall semester of a given year, weighted by the number of credit hours they are taking. Net General Fund appropriations help defray public institutions' operating expenses and keep tuition increases to a minimum. The graph below shows that Kentucky has reduced per-student funding to public higher institutions 18% since 2010.

For this report, we averaged annual net General Fund appropriations per FTE student for the median years it took students to complete a credential at each education level. Then we multiplied that amount by the median time to degree and the number of students in the cohort (public institutions only) to arrive at a total General Fund investment for the high school class of 2010.

Net General Fund Appropriation per FTE Student, 2010-2018



Source: Kentucky Budget of the Commonwealth and Common Fund Institute's Higher Education Price Index. Net General Fund appropriations do not include state financial aid or state monies allocated for debt service and mandated programs.

FIGURE 13. STATE FINANCIAL AID INVESTMENT IN THE CLASS OF 2010 (PUBLIC INSTITUTIONS ONLY)

Key Takeaway: The state of Kentucky invested \$86 million in the cohort attending public institutions through state financial aid (CAP & KEES).

High School Class of 2010 (2010-2018)			
Credential Level	Number of Students in Cohort	Avg. CAP & KEES Disbursement per Student	Total State CAP & KEES Investment
Some College	13,060	\$1,195	\$15.6M
Certificate/Diploma	1,497	\$1,494	\$2.2M
Associate	2,369	\$3,494	\$8.3M
Bachelor's	6,768	\$7,381	\$50M
Graduate	1,145	\$8,567	\$9.8M
			\$86M

Source: Kentucky Higher Education Assistance Authority and KPEDS

Figure 13 estimates the state's total financial aid investment in the cohort (students attending public institutions only) through its two largest programs - CAP (College Access Program, based on need) and KEES (Kentucky Educational Excellence Scholarship, based on academic merit). Since CAP and KEES account for 85% of all state aid programs, other programs were not considered in this calculation for simplicity's sake. Students who attended private colleges and universities were not included because financial aid files for AIKCU institutions were not available.

FIGURE 14. TOTAL STATE HIGHER EDUCATION INVESTMENT IN THE CLASS OF 2010

Key Takeaway: The state invested a total of \$630M in the class of 2010 through net General Fund appropriations and financial aid.

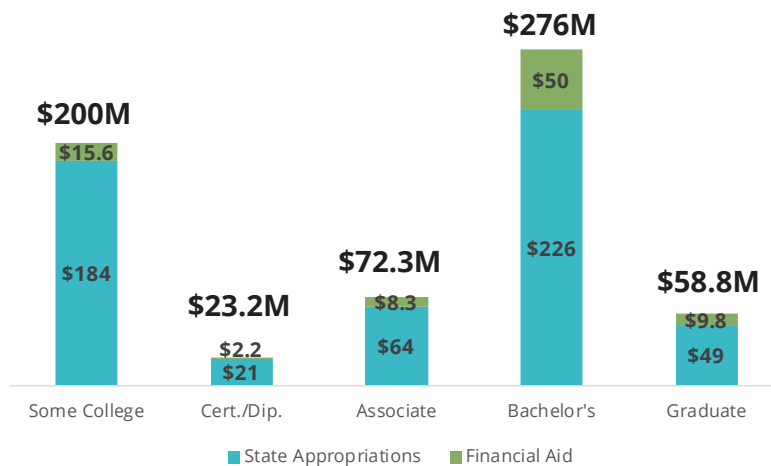
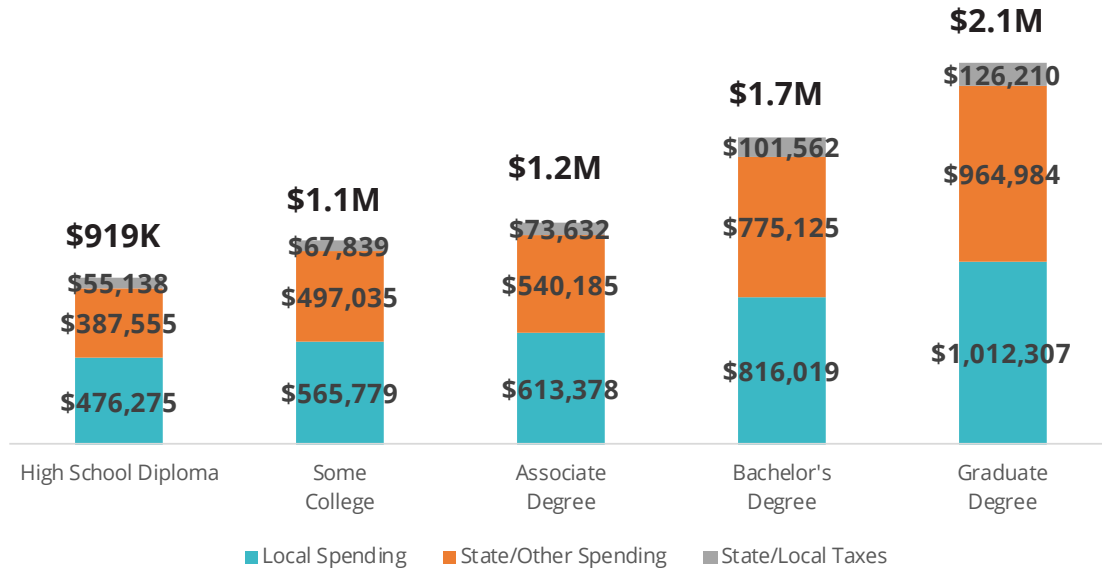


Figure 14 adds expenditures from Figures 12 and 13 to arrive at a total investment amount. Note that the \$9.8 million in state financial aid for graduate students was actually disbursed when these students were undergraduates.

FIGURE 15. **INDIVIDUAL TAXES & SPENDING OVER A LIFETIME BY EDUCATION LEVEL**

Key Takeaway: A college-educated Kentuckian contributes \$283K to \$1.2M more to the state's economy over a lifetime than a high school graduate through state and local taxes and spending



Source: Brookings Institution, 2017 Consumer Expenditure Survey Data, and 2017 American Community Survey 1-year Kentucky public use macro-dataset sample (PUMS) person file.

Using methodology from a Brookings Institution study, we estimated how much more a college graduate contributes to the economy than a high school graduate over a working lifetime (ages 18-64) through state and local taxes and spending. The study assumes that 50% of all consumer spending is local, and the rest is considered state or other. The biggest expenditures in the local category are services (e.g., restaurants, repairmen, fuel, utilities); expenditures like insurance premiums, medical care, and entertainment were classified as state/other spending. Essentially, a Kentuckian with a graduate degree contributes \$1,200,000 more than a high school graduate. A bachelor's degree graduate contributes \$781,000 more, while an associate degree graduate contributes \$281,000 more.

FIGURE 16. **KENTUCKY'S TOTAL RETURN ON INVESTMENT FOR THE CLASS OF 2010**

Key Takeaway: Kentucky's return on the \$630M expended on the Class of 2010 is \$43.8 billion - 69 times the initial investment.

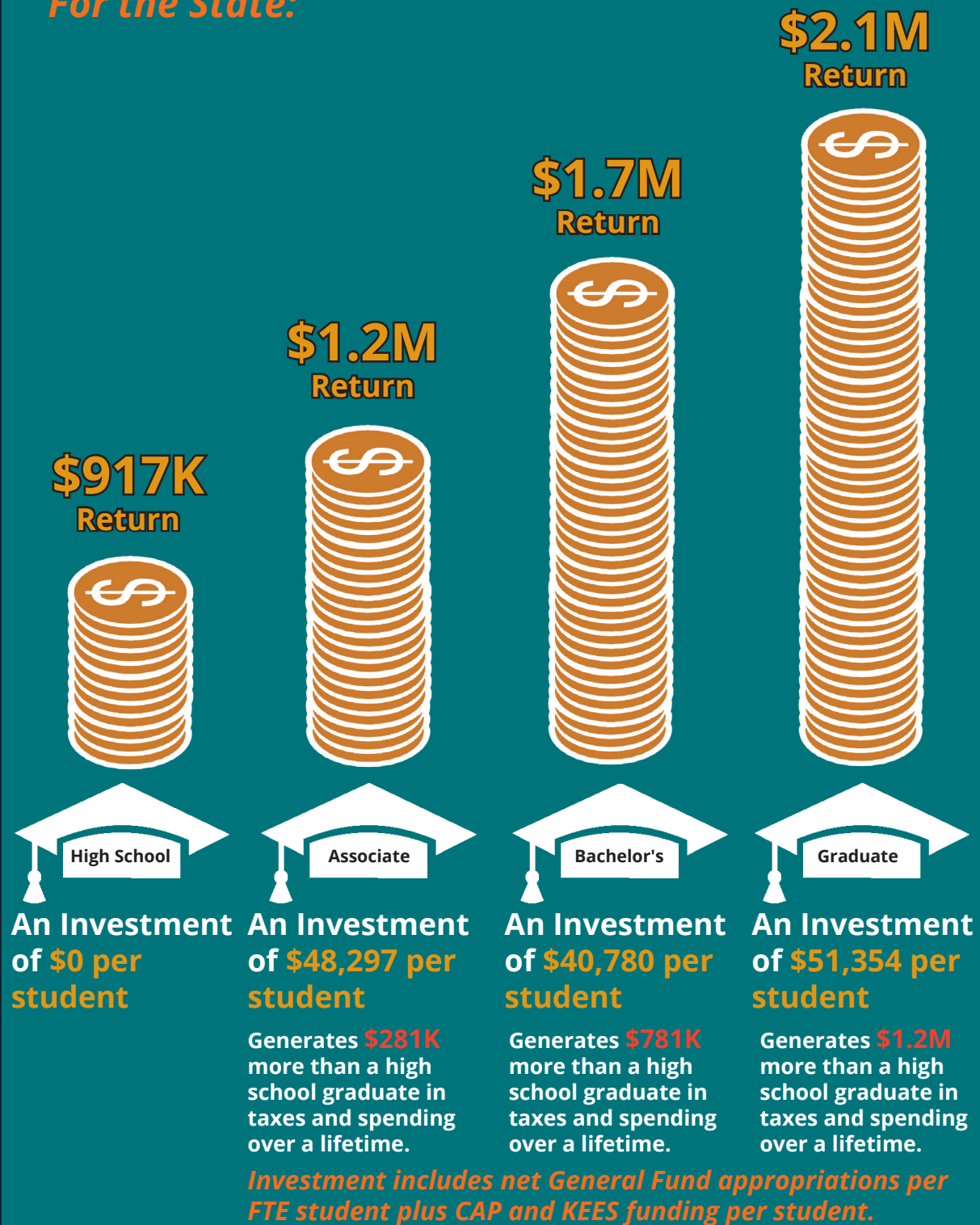
The state's \$630M investment in the cohort generates:			
Education Level	State & Local Spending & Taxes	Number of Students	Total Contributed to the Economy
High School	\$919,000	13,831	\$12.7 billion
Some College	\$1,100,000	13,060	\$14.4 billion
Associate	\$1,200,000	2,369	\$2.8 billion
Bachelor's	\$1,700,000	6,768	\$11.5 billion
Graduate	\$2,100,000	1,145	\$2.4 billion
			\$43.8 billion

Figure 16 multiplies the amount of revenue generated by an individual at a specific level of education over a lifetime by the number of students in the cohort with the requisite credential to arrive at the cohort's total contribution to the state's economy through taxes and spending.

Looking at these calculations, it becomes apparent how increasing Kentucky's educational attainment could dramatically improve the state's ROI. If all of the students with a high school diploma earned an associate degree, the state's return on investment would increase by \$16.6 billion. Moving all of the students with some college into the bachelor's degree category would generate an additional \$22 billion.

FIGURE 17. AVERAGE PER-STUDENT RETURN ON INVESTMENT

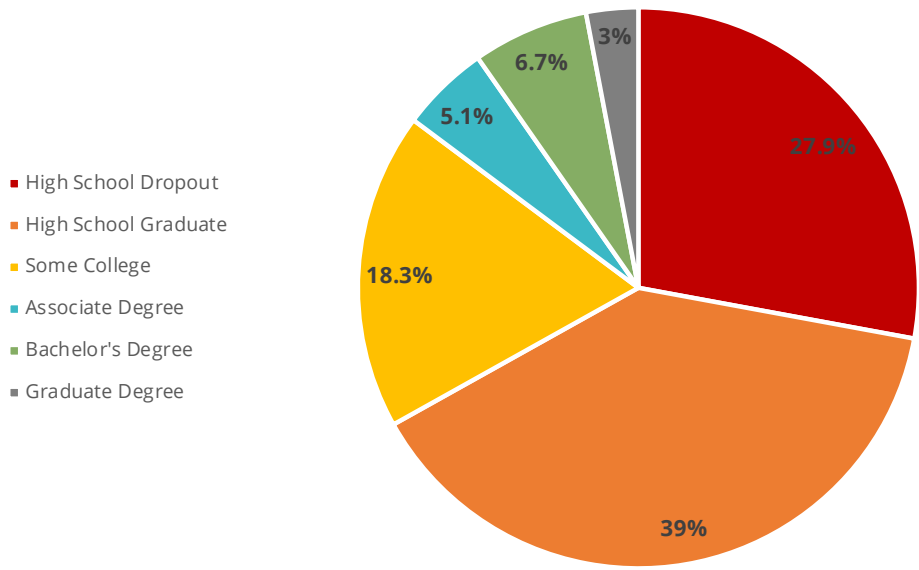
For the State:



Source: Same as Figures 12 - 15.

FIGURE 18. KENTUCKIANS OUT OF THE LABOR FORCE OR UNEMPLOYED IN 2017, BY EDUCATION LEVEL

Key Takeaway: 85% of individuals who were unemployed or out of the workforce in 2017 did not have a college credential.



Source: 2017 American Community Survey 1-year Kentucky public use macro-dataset sample (PUMS) person file.

Kentucky's workforce participation rate is 59%, ranking us in the bottom 10 states in the nation. While this is partly due to the sizable percentage of retirement-aged individuals in Kentucky, it is also a function of worker displacement and the need for additional education and training.

In 2017, 85% of individuals who were unemployed or out of the labor force did not have a college credential. High school graduates comprised 39% of people not working, followed by high school dropouts at 27.9% and individuals with some college but no degree at 18.3%.

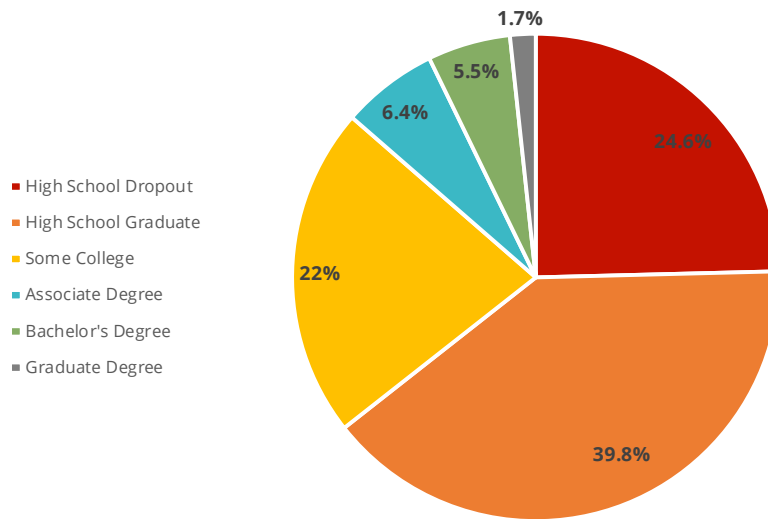
Increasing Kentucky's education levels would likely boost workforce participation rates, a major factor in a company's decision to locate to the state. Additionally, because college graduates earn higher salaries, spending and tax revenue also would increase.

Figure 19 shows participation in entitlement programs by education level. Similar to Figure 18, individuals without a college credential comprised 86% of Medicaid recipients, 88% of SNAP (Supplemental Nutrition Assistance Program) recipients, and 94% of SSI (disability) recipients. Reducing the number of participants would lower costs for the state, although that amount is difficult to quantify, since much of these program costs are paid for by the Federal government.

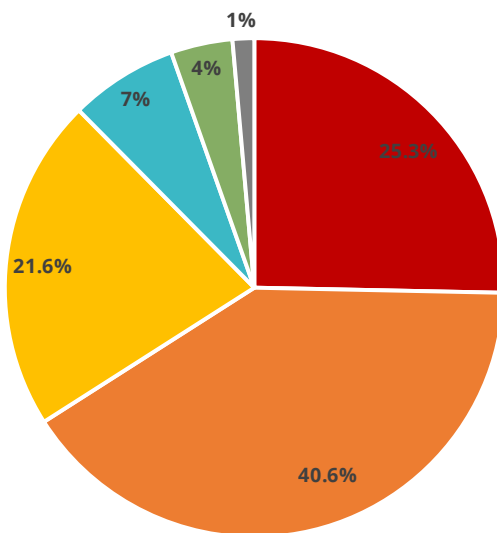
FIGURE 19. PARTICIPATION IN STATE ENTITLEMENT PROGRAMS IN 2017, BY EDUCATION LEVEL

Key Takeaway: People without a college credential accounted for 86% of Medicaid recipients, 88% of SNAP recipients, and 94% of SSI (disability) recipients.

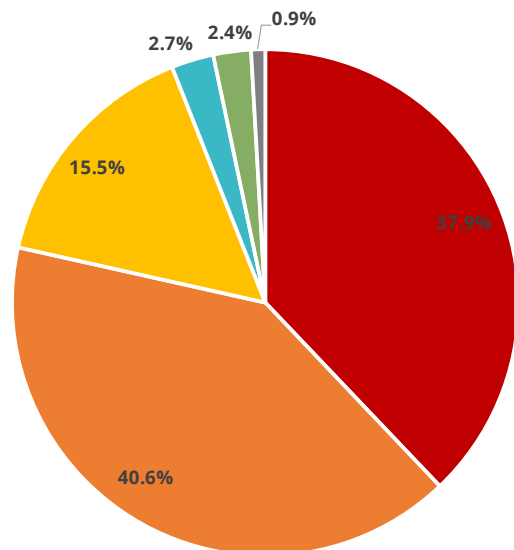
KY MEDICAID RECIPIENTS



KY SNAP RECIPIENTS



KY SSI (DISABILITY) RECIPIENTS



Source: 2017 American Community Survey 1-year Kentucky public use macro-dataset sample (PUMS) person file.

TECHNICAL NOTES

The Cohort

This analysis focuses on Kentucky public high school graduates in 2010 (N = 42,856). Enrollment and degree data are not available for students who attended out-of-state postsecondary institutions, so they are assumed to be high school graduates for purposes of this study.

2010 Kentucky Public High School Graduates (N = 42,856)

High School Only (no postsecondary education), n = 13,831

Some College, n = 13,740

No Degree, Still Enrolled, n = 1,709

Certificate/Diploma Earners, n = 1,497

- 1-2 year Diploma Earners, n = 60
- 1-2 year Certificate Earners, n = 620
- Less than 1 year Certificate Earners, n = 848

Associate Degree Earners, n = 2,422

Bachelor's Degree Earners, n = 8,095

Graduate Degree Earners, n = 1,562

- Master Degree Earners, n = 1,240
- Doctorate/Professional Degree Earners, n = 322

Students who attended and/or earned a credential/degree from the 18 independent institutions belonging to the Association of Independent Kentucky Colleges and Universities (AIKCU) are included in enrollment and degree numbers. However, financial aid data for students attending these schools are not collected by the Council on Postsecondary Education (CPE), so they are excluded in calculations of median financial aid and student loan debt.

A second cohort of analysis is students who enrolled or received a postsecondary credential from a public four- or two-year institution.

2010 Kentucky Public High School Graduates, Public College-Goers Only (N = 40,331)

High School Only (no postsecondary education), n = 13,831

Some College, n = 13,060

No Degree, Still Enrolled, n = 1,661

Certificate/Diploma Earners, n = 1,497

- 1-2 year Diploma Earners, n = 60
- 1-2 year Certificate Earners, n = 620
- Less than 1 year Certificate Earners, n = 848

Associate Degree Earners, n = 2,369

Bachelor's and Graduate Degree Earners, n = 7,913

The remaining 2,525 students in the Class of 2010 may be categorized as: 1) enrolled or graduated from an AIKCU institution with no public postsecondary enrollment (N = 2,424) and, 2) received a degree from a public graduate school with no Kentucky undergraduate enrollment (N = 101).

There are two additional meaningful cohorts: 1) students who had enrollment at a public four- or two-year institution (N = 26,500) and 2) certificate/diploma, associate degree, and bachelor's degree graduates at public four- and two-year institutions (N = 11,779).

Educational Attainment Level

When this cohort is presented by educational attainment level, students are categorized by their highest credential earned, even if the student was enrolled in a higher credential program at the end of the timeframe for this analysis (2010-18).

- **Associate** – Any 2010 Kentucky public high school graduate who earned an associate degree at a Kentucky public or AIKCU institution and no higher degree before 2018.
- **Bachelor's** – For cost purposes, any 2010 Kentucky public high school graduate who earned a bachelor's degree at a Kentucky public or AIKCU institution or a higher-level degree before 2018. For earnings purposes, any 2010 Kentucky public high school graduate who earned a bachelor's degree at a Kentucky public or AIKCU institution and no higher degree before 2018, which included 23 post-baccalaureate certificate earners.
- **Certificate/Diploma** – Any 2010 Kentucky public high school graduate who earned a certificate/diploma at a Kentucky public or AIKCU institution and no higher degree before 2018.
- **Graduate** - Any 2010 Kentucky public high school graduate who earned a graduate degree at a Kentucky public or AIKCU institution and no higher degree before 2018.
- **High School** – Any 2010 Kentucky public high school graduate who never enrolled in postsecondary education at a Kentucky public or AIKCU institution between high school graduation and 2018. Students who go to school out-of-state and return to Kentucky to work remain in the “high school” cohort. (Historically, about 5% of Kentucky public high school graduates leave the state for postsecondary education. Some of these students do not complete a postsecondary credential and not all return to Kentucky for employment purposes.)
- **Some College** – Any 2010 Kentucky public high school graduate who enrolled at a Kentucky public or AIKCU institution before 2018, but was not enrolled in 2018 and did not earn a postsecondary credential.
- **No Degree, Still Enrolled** – Any 2010 Kentucky public high school graduate who was enrolled in 2018 at a Kentucky public or AIKCU institution and had not earned a postsecondary credential.

Figure 1. Total Net Cost for the Class of 2010 (from Entry to 2018)

Median Time to Degree – the actual number of years that elapsed between the time the student first enrolled until the credential/degree was awarded. If the student stopped out, the stop-out time is included in the time to degree. The spring semester was considered 0.5 years and the summer and/or fall was considered 0.5 years (n = 11,779).

Total Cost of Attendance – the median total cost of attendance for each student as reported by each institution's financial aid office for the duration of the student's enrollment (n = 11,779).

Total Grants and Scholarships – the median total grants from all sources (i.e., federal, state, and institutional) as reported by each institution’s financial aid office for the duration of the student’s enrollment (n = 11,779).

Total Net (Out-of-Pocket) Cost – the cost of attendance minus grants and scholarships.

Total Percent Funded by Aid – grants and scholarships divided by total cost of attendance.

Figure 2. Total Net Cost, By Credential and Discipline

Same as Figure 1. Certificate/diploma-level arts/humanities and education data, as well as associate-level education data, are redacted due to small sample size (fewer than 20).

Figure 3. Annual Tuition and Fee Increases at Public Institutions

Annual Tuition and Fees Increase – the unweighted average increase in undergraduate tuition and fees at each public institution from one academic year to the next academic year.

Figure 4. Borrowers in the High School Class of 2010 (Public Institutions Only)

Borrower – a student at a public institution who was disbursed at least one undergraduate loan from any source [i.e., federal need and non-need, institutional, private, commercial, or other (n = 14,433)].

Non-Borrower – a student at a public institution who was not disbursed an undergraduate loan from any source [i.e., federal need and non-need, institutional, private, commercial, or other (n = 12,067)].

Figure 5. Median Loan Debt & Interest for the High School Class of 2010 (From Entry to 2018, Attending Public Universities Only)

Median Loan Debt – the median total undergraduate loan debt of all student borrowers (n = 14,434). Parent PLUS loans and any other debit (e.g., credit card) accrued toward postsecondary costs are not included because data were not available.

Median Loan Interest – the median total interest was determined by using the U.S. Department of Education Repayment Calculator. The repayment calculator makes assumptions about the repayment period, discretionary income, variable interest rates, and consolidation loans. For purposes of this calculation, the median loan debt of certificate/diploma, associate, and bachelor's degree graduates is the balance, the loan type is unsubsidized, and the interest rate is 4.2% (the average interest rate of subsidized and unsubsidized loans from 2013-14 to 2017-18). The tax filing and marital status is single with zero dependent children nor other dependents. The state of residence is Kentucky and the Adjusted Gross Income entered is the median annual earnings in 2018 by degree level (see Figure 7). The loan interest amounts are based on the standard repayment plan.

Figure 6. Median Debt & Interest, By Credential & Discipline

Same as Figure 5. Certificate/diploma-level arts/humanities and education data, as well as associate-level education data, are redacted due to small sample size (fewer than 20).

Figure 7. Median Annual Earnings of the High School Class of 2010

Median Annual Earnings – the median actual earnings for all 2010 Kentucky public high school graduates from 2011-2018, by educational attainment level (n = 25,845), from unemployment insurance (UI) records.

Figure 8. Median Entry-Level Earnings (Two Years After Completion), By Credential & Discipline

Two Years after Completion – two years after the “median time to degree” (same as Figure #1), assuming the student started in the fall of 2011.

All first- and second-year earnings in years prior to 2018 (i.e., 2011-2017) are adjusted from current dollars to constant 2018 dollars using the Bureau of Labor Statistics' Inflation Calculator (January is used as the calculation period). Also, if a student earns a credential (e.g., associate degree) and then enrolls in a higher credential program (e.g., bachelor's degree), the first- and second-year earnings are reported for the first credential if the second credential had not yet been earned.

Students who completed in 2018 are excluded because they had no data for first- and second-year earnings. Students who completed in 2017 are excluded in year 2 wages. Postsecondary credential earners who had no earnings data are assumed to be working (e.g., self-employed, out-of-state) and are applied to the average salary for that credential level's area of study (e.g., associate degree earner in health).

Certificate/diploma-level arts/humanities and education data, as well as associate-level education data, are redacted due to small sample size (fewer than 20).

Figure 9. Median Opportunity Cost of Going to College (In Lost Wages)

Opportunity Cost – the difference in the median annual earnings of high school graduates and the median annual earnings of certificate/diploma, associate degree, and bachelor's degree earners by federal fiscal year (i.e., 2011 is October 1, 2010 to September 30, 2011).

Figure 10. Median College Investment

Total Net Cost - Same as Figure 1.

Opportunity Cost (Lost Earnings) - Same as Figure 9.

Student Loan Interest - Same as Figure 5.

Total Investment – Total net cost plus opportunity cost plus student loan interest (for simplicity's sake, median loan interest was included in this calculation even if students accrued zero loan debt).

Figure 11. Average Return on Investment over a Lifetime (for a Student)

Lifetime Earnings – using the 2017 American Community Survey (ACS) 1-year Kentucky Public Use Microdata Sample (PUMS), the annual average income of Kentuckians within five-year age ranges (i.e., 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64) is calculated and disaggregated by educational attainment level (i.e., high

school diploma/GED; some college, no degree; associate degree; bachelor's degree; graduate degree). Then, those eight annual average incomes are multiplied by five (i.e., duration of age range) for each educational attainment level and summed across the lifetime.

Figure 12. Net General Fund Investment in the Class of 2010 (Public Institutions Only)

Average Net General Fund (GF) Appropriation per Full-Time Equivalent (FTE) Student – Net GF appropriation per FTE student is calculated by taking the number of students enrolled statewide in public institutions (fall semester only, all levels of students and high school dual-credit students), weighted by the number of credit hours they are taking, divided by the total state General Fund appropriation amount for that year (as reported to the Southern Regional Education Board). To arrive at an average appropriation at each level, the dollar amounts for each year in the median time to degree are used (e.g., if median time to degree is 2 years, dollar amounts for 2010-11 and 2011-12 are averaged). This methodology assumes all students started in the fall 2010 semester, thus slightly overestimating per-student appropriations because not all students started immediately after high school and funding amounts decreased in each year of the analysis.

Median Time to Degree – same as Figure 1, except for the sample size, which is $n = 40,331$

Total Net GF (General Fund) Appropriation Per FTE (Full-Time Equivalent) Student – the average net GF appropriation per FTE student at each level multiplied by the median time to degree.

Number of Students in the Cohort – $n = 24,839$

Total Net GF Investment in the Cohort, by Level – the total net GF appropriation per FTE student multiplied by the number of students in the cohort at each educational attainment level.

Figure 13. State Financial Aid Investment in the Class of 2010 (Public Institutions Only)

Number of Students in the Cohort – $n = 24,839$

Average (Avg.) CAP and KEES Disbursement per Student – the total amount of CAP and KEES disbursed to the cohort (from 2010-11 to 2017-18), divided by the number of students at each educational attainment level (i.e., some college, certificate/diploma, associate degree, bachelor's degree, graduate degree).

Total State CAP and KEES Investment – number of students in the cohort multiplied by the average CAP and KEES disbursement per student at each educational attainment level.

Figure 14. Total State Higher Education Investment in the Class of 2010

The total net GF investment in the cohort (Figure 12) plus the total state CAP and KEES investment in the cohort (Figure 13).

Figure 15. Individual Taxes and Spending Over a Lifetime by Education Level

Using the Brookings methodology, "Expenditures by local category, all households, United States, 2014" (table 1) was updated using Kentucky 2017 Consumer Expenditure Survey data. The percentage of "local spending" was 39.56% in 2014 and 40.11% in 2017. Therefore, this study confirmed that 40% of total spending is local, same as in the Brookings methodology.

The “Average annual income and spending by category, households by educational attainment of highest educated member, United States, 2014” (table 2) was updated using Kentucky 2017 Consumer Expenditure Survey data for two columns: “Before tax income” and “Total spending.” The “State and local taxes” column was calculated based on a uniform 6% of the before-tax income for all educational attainment levels to reflect Kentucky tax law. The “Local spending” column was calculated using the same percentage (by educational attainment level) as the 2014 study, which ranged from 52% to 48% (decreasing as educational attainment level increased).

The lifetime “earnings,” “total spending,” “local spending” and “state and local taxes” were calculated the same as in the Brookings study. The average income (basic variables: SEMP + WAGP) by educational attainment level (basic variable: SCHL) for each age (basic variable: AGEP) group was determined using the 2017 American Community Survey (ACS) 1-year Kentucky public use macro-dataset sample (PUMS) person file. Persons ages 25-64 were segregated into eight groups, 5-year age ranges (e.g., 24-29, 30-34, 35-39, 40-44, etc.), with identifiable educational attainment level by person. The average income, by educational attainment level and age range, was multiplied by the percent of spending shares (i.e., total spending divided by income before taxes). That value was multiplied by five (for the five years it represents and is the “lifetime earnings”), then summed for all age ranges and labeled lifetime “total spending,” “local spending” and “state and local taxes.” Dissimilar to the Brookings methodology, the net present value of earnings was not adjusted (same as in Indiana's ROI report).

Figure 16. Total Return on Investment for the Class of 2010

The total state and local taxes and spending by educational attainment level (Figure 15) multiplied by the number of students in the cohort at each educational attainment level (public institutions only).

Figure 17. Average Per-Student Return on Investment (Over a Lifetime, for the State)

Return - individual state and local taxes and spending by education level (Figure 15).

State Investment by Education Level – total net GF Appropriation per FTE student (Figure 12) plus the average CAP and KEES disbursement per student (Figure 13).

Figure 18. Kentuckians Out of the Labor Force or Unemployed in 2017, by Education Level

Calculations were made by using the 2017 American Community Survey (ACS) 1-year Kentucky public use macro-dataset sample (PUMS):

Workforce Participation – person file, basic variable: COW, value: 9.

Figure 19. Participation in State Entitlement Programs by Education Level

Calculations were made by using the 2017 American Community Survey (ACS) 1-year Kentucky public use macro-dataset sample (PUMS):

Medicaid – person file, basic variable: HINS4, value: 1.

SNAP – person and housing file, basic housing variable: FS, value: 1.

Social Security Income – person file, basic variable: SSIP.

 **Kentucky Council on
Postsecondary Education**

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