



Analysis of the Economic Impact and Return on Investment of Education

THE ECONOMIC VALUE OF THE
COMMUNITY COLLEGE OF DENVER

May 2017

A wide-angle photograph of a university campus. In the foreground, a brick-paved walkway with several young trees and a few people walking. In the middle ground, a large, light-colored building with a red-tiled roof and multiple towers, likely a church or historic building. In the background, a city skyline with various skyscrapers under a blue sky with light clouds. A large, wavy purple graphic element is overlaid on the top half of the image.

EXECUTIVE SUMMARY

Executive summary

The Community College of Denver (CCD) creates value in many ways. The college plays a key role in helping students increase their employability and achieve their individual potential. It provides students with the skills they need to have fulfilling and prosperous careers. Further, it supplies an environment for students to meet new people, increase their self-confidence, and promote their overall health and well-being.

The value of CCD influences both the lives of students and the regional economy. The college serves a range of industries in Denver, supports local businesses, and benefits society as a whole in Colorado from an expanded economy and improved quality of life. The benefits created by CCD even extend to the state government through increased tax revenues and public sector savings.

The purpose of this study is to investigate the economic impacts created by CCD on the business community and the benefits that the college generates in return for the investments made by its key stakeholder groups—students, taxpayers, and society. The region the college serves consists of the majority of Denver County and is referred to

as Denver in this analysis. The following two analyses are presented:

- **Economic impact analysis**
- **Investment analysis**

All results reflect student and financial data for Fiscal Year (FY) 2015-16. Impacts on the regional business community are reported under the economic impact analysis. Results are measured in terms of added income. The return on investment to students, taxpayers, and society are reported under the investment analysis. Both analyses are described more fully in the following sections.



Economic impact analysis

CCD promotes economic growth in Denver in a variety of ways. The college is an employer and buyer of goods and services, and the living expenses of students benefit local businesses. In addition, CCD is a primary source of education to Denver residents and a supplier of trained workers to regional industries.

OPERATIONS SPENDING IMPACT

CCD is an important employer in Denver. In FY 2015-16, the college employed 578 full-time faculty, adjunct instructors, and staff. Of these, 38% lived in Denver. Total payroll at CCD was \$32.5 million, much of which was spent in the region for groceries, rent, dining out, clothing, and other household expenses.

CCD is itself a large-scale buyer of goods and services. In FY 2015-16, the college spent \$21.6 million to cover its expenses for facilities, professional services, and supplies.

CCD added \$36.5 million in income to the region during the analysis year as a result of its day-to-day operations. This figure represents the college’s payroll, the multiplier effects generated by the spending of the college and its employees, and a downward adjustment to account for funding that the college received from state sources. The \$36.5 million in added income is equivalent to supporting 658 jobs.

CONSTRUCTION SPENDING IMPACT

CCD commissioned contractors to build or renovate a number of facilities during the analysis year. The quick infusion of earnings and jobs that occurred in the regional economy as a result of this construction spending is only considered short-term due to the one-time nature of construction projects. Nonetheless, the construction spending had a substantial impact on the regional economy in FY 2015-16, equal to \$106.4 thousand in added income for Denver, which is equivalent to supporting two jobs.

STUDENT SPENDING IMPACT

Around 31% of students attending CCD originated from outside the region in FY 2015-16, and some of these students relocated to Denver to attend CCD. These students would not have come to the region if the college did not exist. In addition, a number of in-region students would have left the area for other education

TABLE 1: Impacts created by CCD in FY 2015-16

ADDED INCOME	JOBS
\$36.5 million	658
Operations spending impact	
\$106.4 thousand	2
Construction spending impact	
\$44.4 million	946
Student spending impact	
\$157.3 million	2,748
Alumni impact	
\$238.4 million	4,354
Total impact	

opportunities if not for the existence of CCD. While attending the college, these relocated and retained students spent \$66.9 million to purchase groceries, rent accommodation, pay for transportation, and so on. A significant portion of these expenditures occurred in the region, generating \$44.4 million in added income in the regional economy during the analysis year, which is equivalent to supporting 946 jobs.

ALUMNI IMPACT

The education and training CCD provides for regional residents results in the greatest impact. Since the college was established, students have studied at CCD and entered the regional workforce with new skills. Today, thousands of former students are employed in Denver.

During the analysis year, former students of CCD generated \$157.3 million in added income for the region. This figure represents the higher earnings that students earned during the year, the increased output of the businesses that employed the students, and the multiplier effects that occurred as students and their employers spent money at other businesses. This \$157.3 million in added income is equivalent to supporting 2,748 jobs.

TOTAL IMPACT

The overall impact of CCD on the local business community during the analysis year amounted to \$238.4 million in added income, equal to the sum of the operations spending impact, the construction spending impact, the student spending impact, and the alumni impact. The \$238.4 million in added income was equal to approximately 0.6% of the GRP of Denver. By comparison, this contribution that the college provides on its own is nearly half the size of the entire Utilities industry in the region.

The total impact is also expressed in terms of the jobs supported by the added income; they are calculated by jobs-to-sales ratios specific to each industry. Overall, the \$238.4 million impact supports 4,354 jobs.

A portion of the total \$238.4 million is broken out into an industry-by-industry impact ordered by added income. Table 2 outlines the top industries impacted by CCD. Because industries have different jobs-to-sales ratios, the associated jobs supported by the CCD impact differ by industry. Nonetheless, these are impacts that would not have been generated without the college’s presence.

TABLE 2: Top industries impacted by CCD

TOTAL INCOME (MILLIONS)	JOBS
\$36.2	828
Health Care & Social Assistance	
\$34.7	760
Accommodation & Food Services	
\$21.8	311
Professional & Technical Services	
\$16.8	202
Government, Non-Education	
\$14.1	100
Management of Companies & Enterprises	
\$114.8	2,153
All other industries	
\$238.4	4,354
Total impact	



Investment analysis

Investment analysis is the process of evaluating total costs and measuring these against total benefits to determine whether or not a proposed venture will be profitable. If benefits outweigh costs, then the investment is worthwhile. If costs outweigh benefits, then the investment will lose money and is considered unprofitable. This study considers CCD as an investment from the perspectives of students, taxpayers, and society. The backdrop for the analysis is the entire Colorado economy.

STUDENT PERSPECTIVE

In FY 2015-16, CCD served 13,616 credit students and 209 non-credit students. In order to attend college, students paid for tuition, fees, books, and supplies. They also gave up money that they would have otherwise earned had they been working instead of attending college. The total investment made by CCD's students in FY 2015-16 amounted to \$89.8 million, equal to \$31.2 million in out-of-pocket expenses plus \$58.6 million in forgone time and money.

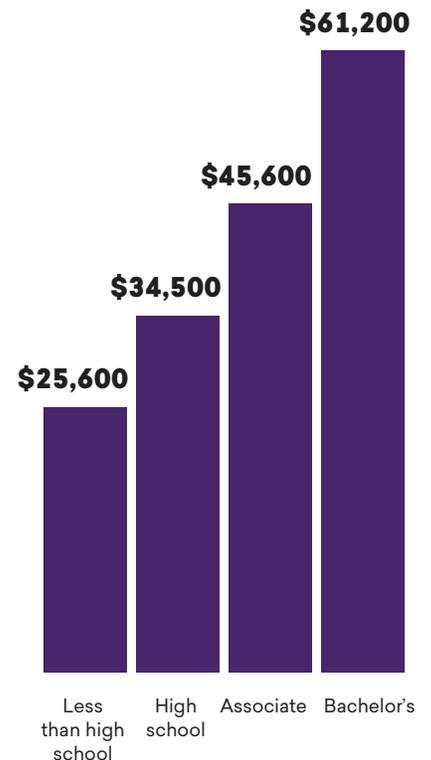
In return for their investment, CCD's students will receive a stream of higher future earnings that will continue to grow through their working lives. As shown in Figure 1, mean earnings levels at the midpoint of the average-aged worker's career increase as people achieve higher levels of education. For example, the average associate degree completer from CCD will see an increase in earnings of \$11,100 each year compared to someone with a high school diploma or equivalent working in Colorado. Over a working lifetime, this increase in earnings amounts to an undiscounted value of approximately \$477,300 in higher earnings.

The present value of the higher future earnings that CCD's students will receive over their working careers is \$439.2 million. Dividing this value by the \$89.8 million in student costs yields a benefit-cost ratio of 4.9. In other words, for every \$1 students invest in CCD in the form of out-of-pocket expenses and forgone time and money, they receive a cumulative of \$4.90 in higher future earnings. The average annual rate of return for students is 15.4%. This is an impressive return, especially when compared to the 10-year average 7.2% return to the U.S. stock market (Figure 2).

TAXPAYER PERSPECTIVE

CCD generates more in tax revenue than it takes. These benefits to taxpayers consist primarily of taxes that the state government will collect from the added revenue created in the state. As CCD students earn more, they will make higher

FIGURE 1: Average earnings by education level at career midpoint in Colorado



Source: Emsi complete employment data.

tax payments. Employers will also make higher tax payments as they increase their output and purchase more supplies and services. By the end of the FY 2015-16 students' working careers, the state government will have collected a present value of \$207.6 million in added taxes.

Benefits to taxpayers consist of the savings generated by the improved lifestyles of students and the proportionally reduced government expenditures. Education is statistically correlated with a variety of lifestyle changes that generate taxpayer savings across three main categories: 1) health, 2) crime, and 3) unemployment. Improved health habits lower the students' demand for national health care services. Students are also less likely to commit crimes, so the demand for law enforcement and criminal justice services is reduced (study references are available in the main report). Students are also more employable, so the demand for welfare and unemployment benefits, such as earnings assistance and welfare benefits, is reduced. For a list of study references to these statistical benefits, please contact the college for a copy of the main report. All of these benefits will generate a present value of \$9.9 million in savings to state taxpayers.

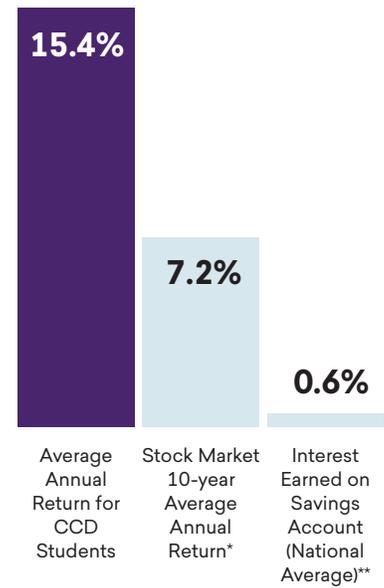
Total benefits to taxpayers equal \$217.5 million, equal to the sum of the added taxes and public sector savings. Comparing this to the taxpayer costs of \$20.5 million—equal to the funding that CCD received from the state government during the analysis year—yields a benefit-cost ratio of 10.6. This means that for every \$1 of public money invested in CCD, taxpayers receive a cumulative value of \$10.60 over the course of the students' working lives. The average annual rate of return is 44.4%, a solid investment that compares favorably with other long-term investments in both the private and public sectors.

SOCIAL PERSPECTIVE

Society as a whole within Colorado benefits from the presence of CCD in two major ways. The first and largest benefit that society receives is an increased state economic base. As discussed in the previous section, the higher student earnings and increased business output occurs across the state. This raises prosperity in Colorado and expands the economic base for society as a whole.

Benefits to society also consist of the savings generated by the improved lifestyles of students. Similar to the taxpayer section above, education is statistically correlated with a variety of lifestyle changes that generate social savings. Note that these costs are avoided by the consumers, and are distinct from the costs avoided by taxpayers outlined above. Health savings include avoided medical costs associated with smoking, alcoholism, obesity, drug abuse, and mental disorders. Crime savings include reduced security expenditures and insurance administration, lower victim costs, and reduced criminal justice system expenditures. Unemployment savings include the reduced employer contributions towards unemployment claims. For a list of study references to these statistical benefits, please contact the college for a copy of the main report.

FIGURE 2: Student rate of return



* Forbes' S&P 500, 1994-2014.

** FDIC.gov 12-2016.

FIGURE 3: Present value of higher earnings and social savings in Colorado

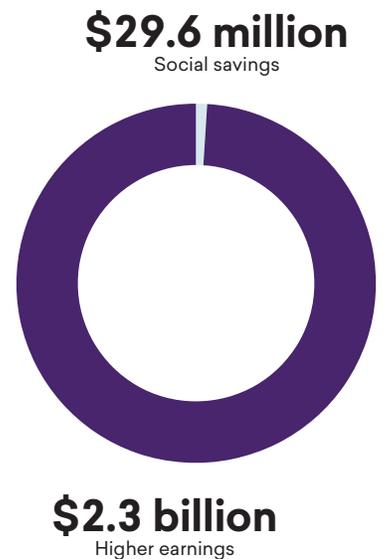


Figure 3 shows the present value of the higher earnings and social savings that will occur in Colorado over the working lifetime of the FY 2015-16 student population at CCD. Higher earnings amounts to a present value of \$2.3 billion due to the increased lifetime earnings of students and associated increases in business output. Social savings amount to \$29.6 million, the sum of health, crime, and unemployment savings in Colorado. Altogether, total benefits to society equal \$2.4 billion (in present value terms).

Society invested \$123.1 million in CCD educations during the analysis year. This includes all expenditures by CCD, all student expenditures, and all student opportunity costs. For every dollar of this investment, society as a whole in Colorado will receive a cumulative value of \$19.30 in benefits, equal to the \$2.4 billion in benefits divided by the \$123.1 million in costs. These benefits will occur for as long as CCD's FY 2015-16 students remain employed in the state workforce.

SUMMARY OF INVESTMENT ANALYSIS RESULTS

Table 3 presents the results of the investment analysis for all three of CCD's major stakeholder groups—students, taxpayers, and society. As shown, students receive great value for their educational investment. At the same time, the investment made by state taxpayers to the college creates a wide range of benefits to society and returns more to government budgets than it costs.

TABLE 3: Summary of investment analysis results

	STUDENT PERSPECTIVE	TAXPAYER PERSPECTIVE	SOCIAL PERSPECTIVE
Present value benefits	\$439.2 million	\$217.4 million	\$2.4 billion
Costs	\$89.8 million	\$20.5 million	\$123.1 million
Net present value	\$349.5 million	\$196.9 million	\$2.3 billion
Benefit-cost ratio	4.9	10.6	19.3
Rate of return	15.4%	44.4%	N/A*

* The rate of return is not reported for the social perspective because the beneficiaries of the investment are not necessarily the same as the original investors.



Conclusion

The results of this study demonstrate that CCD creates value from multiple perspectives. The college benefits local businesses by increasing consumer spending in the region and supplying a steady flow of qualified, trained workers into the workforce. It enriches the lives of students by raising their lifetime earnings and helping them achieve their individual potential. It benefits state taxpayers through increased tax receipts across the state and a reduced demand for government-supported social services. Finally, it benefits society as a whole in Colorado by creating a more prosperous economy and generating a variety of savings through the improved lifestyles of students.

ABOUT THE STUDY

Data and assumptions used in the study are based on several sources, including the FY 2015-16 academic and financial reports from the college, industry and employment data from the U.S. Bureau of Labor Statistics and U.S. Census Bureau, outputs of Emsi's Multi-Regional Social Accounting Matrix model, and a variety of studies and surveys relating education to social behavior. The study applies a conservative methodology and follows standard practice using only the most recognized indicators of investment effectiveness and economic impact. For a full description of the data and approach used in the study, please contact the college for a copy of the main report.



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