



Reported to the Board of Trustees
September 27, 2018

Analysis of the **Economic Impact and Return on Investment** of Education

THE ECONOMIC VALUE OF THE UNIVERSITY OF ILLINOIS AT CHICAGO

August 2018

A photograph of a woman with dark curly hair, wearing a teal blazer, standing at a podium and speaking to a group of students in a classroom. The students are seated at desks, some looking towards the speaker. The background is a stone wall. A whiteboard is visible on the right side of the frame. The text "EXECUTIVE SUMMARY" is overlaid in large white letters across the bottom half of the image.

EXECUTIVE SUMMARY

 Emsi

Executive summary

The University of Illinois at Chicago (UIC) creates value in a variety of ways. The university improves higher education delivery throughout the state and helps students increase their employability and potential. The university facilitates new research that creates start-up companies, provides healthcare for the state through its hospital and clinics, and also draws visitors to the state, generating new dollars and opportunities for Illinois.

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

This study investigates the economic impacts created by UIC on the business community and the benefits that the university generates for its key stakeholder groups—students, taxpayers, and society. The following two analyses are presented:

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

All results reflect student and financial data for fiscal year (FY) 2017 (July 1, 2016 through June 30, 2017). Impacts on the state business community are reported under the economic impact analysis. Results are measured in terms of added income. The returns on investment to students and society and the benefits received by taxpayers are reported under the investment analysis. Both analyses are described more fully in the subsequent sections.



Economic impact analysis

UIC promotes economic growth in Illinois through its direct expenditures and resulting expenditures of students, visitors, and state businesses. The university serves as an employer and buyer of goods and services for its academic, research, and hospital operations. Numerous start-up companies have formed through programs and knowledge at UIC. The university's reputation and activities attract students and visitors from outside Illinois, whose expenditures benefit state vendors. UIC is a primary source of education to Illinois residents and a supplier of trained workers to the state industries, increasing overall productivity in the state workforce.

OPERATIONS SPENDING IMPACT

UIC is an important employer in Illinois. In FY 2017, the university employed 10,295 full-time and part-time faculty and staff (not including research and hospital employees). Of these, 97% lived in Illinois. Total payroll at UIC was \$1.2 billion (excluding payroll from research and hospital employees), much of which was spent in the state for groceries, rent, dining out, clothing, and other household expenses.

UIC is itself a large-scale buyer of goods and services. In FY 2017, the university spent \$446 million to cover its expenses for facilities, professional services, and supplies, excluding research and hospital expenditures.

UIC added \$1.5 billion in income to the state economy during the analysis year as a result of its day-to-day operations. This figure represents the university's payroll, the multiplier effects generated by the spending of the university and its employees, and a downward adjustment to account for funding that the university received from state and local sources. The \$1.5 billion in added income is equivalent to supporting 13,988 jobs.

NOTE: Added income should not be confused with personal income or sales. It is important to bear in mind, that much of this sales revenue leaves the state economy through intermediary transactions and costs. Rather, income remains in the region and is synonymous to value added or gross state product.

RESEARCH SPENDING IMPACT

Research activities impact the economy by employing people and requiring the purchase of equipment and other supplies and services. In FY 2017, UIC spent \$180.6 million on payroll to support research activities. This, along with \$192.1 million in other research spending, created a net total of \$424.6 million in added income for the state economy. This added income is equivalent to supporting 4,370 jobs.

Over the last four years, UIC received 624 invention disclosures, filed 199 new U.S. patent applications, and produced 212 licenses. Total license income over the same

four-year time period grew from \$25.4 million in FY 2013-14 to \$28 million in FY 2017, an approximate \$2.6 million increase.

TABLE 1: Research developments created by UIC

| | INVENTIONS | PATENTS | LICENSES |
|--------------|------------|------------|------------|
| 2013-14 | 169 | 60 | 52 |
| 2014-15 | 169 | 46 | 52 |
| 2015-16 | 138 | 45 | 56 |
| 2016-17 | 148 | 48 | 52 |
| Total | 624 | 199 | 212 |

HOSPITAL SPENDING IMPACT

The University of Illinois Hospital & Health Sciences System (UI Health) provides a hands-on learning and research environment for students and employs hundreds of workers. Although broader health-related impacts are outside the scope of this analysis, the hospital is also known for providing quality patient care.

In FY 2017, UIC spent over \$1.1 billion on hospital operations. These expenditures added a net impact of \$1.5 billion in added income to the state. This is equivalent to supporting 14,348 jobs.

START-UP COMPANY IMPACT

UIC creates an exceptional environment of discovery that fosters innovation and entrepreneurship, evidenced by the number of UIC start-up companies created in the state. Start-up companies are created specifically to license and commercialize UIC technology or knowledge. In FY 2017, UIC start-up companies added \$342.7 million in income to the Illinois economy, which is equivalent to supporting 683 jobs.

STUDENT SPENDING IMPACT

Around 17% of graduate and undergraduate students attending UIC originated from outside the state in FY 2017, and some of these students relocated to Illinois to attend UIC. These students may not have come to the state if the university did not exist. In addition, a number of in-state students might have left the state for other educational opportunities if not for the existence of UIC. While attending the university, these relocated and retained students spent \$98.7 million to purchase groceries, rent accommodation, pay for transportation, and so on. A significant portion of these expenditures occurred in the state, generating \$87.2 million in added income in the state economy during the analysis year, which is equivalent to supporting 1,648 jobs.

TABLE 2: Impacts created by UIC in FY 2017

| ADDED INCOME | JOBS |
|----------------------------|---------------|
| \$1.5 billion | 13,988 |
| Operations spending impact | |
| \$424.6 million | 4,370 |
| Research spending impact | |
| \$1.5 billion | 14,348 |
| Hospital spending impact | |
| \$342.7 million | 683 |
| Start-up company impact | |
| \$87.2 million | 1,648 |
| Student spending impact | |
| \$4.0 million | 83 |
| Visitor spending impact | |
| \$3.8 billion | 38,440 |
| Alumni impact | |
| \$7.6 billion | 73,559 |
| Total impact | |



VISITOR SPENDING IMPACT

Thousands of visitors from outside the state were attracted to UIC during the analysis year to attend commencement, cultural and sporting events, and other activities sponsored by the university. While in the state, visitors spent money for lodging, food, transportation, and other personal expenses. The off-campus expenditures of the university's out-of-state visitors generated a net impact of \$4 million in added income for the state economy in FY 2017. This \$4 million in added income is equivalent to supporting 83 jobs.

ALUMNI IMPACT

The education and training UIC provides for state residents results in the greatest impact. As shown in Figure 1, since the university was established, students have studied at UIC and entered the state workforce with new skills. Today, thousands of former students are employed in Illinois.

During the analysis year, past and present students of UIC generated \$3.8 billion in added income for the state. 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 \$3.8 billion in added income is equivalent to supporting 38,440 jobs.

TOTAL IMPACT

The overall impact of UIC on the state business community during the analysis year amounted to \$7.6 billion in added income, equal to the sum of the operations spending impact, the research spending impact, the hospital spending impact, the start-up company impact, the student spending impact, the visitor spending impact, and the alumni impact. The \$7.6 billion in added income was equal to approximately 1.0% of the gross state product of Illinois. By comparison, this contribution that the university provides on its own is larger than the entire Arts, Entertainment, & Recreation industry in the state.

The total impact is also expressed in terms of the jobs supported by the added income, and they are calculated by jobs-to-sales ratios specific to each industry. Overall, the \$7.6 billion impact supports 73,559 jobs. For perspective, with 7.8 million jobs in the state, this means that one out of every 106 jobs in Illinois is supported by the activities of UIC and its students.

A portion of the total \$7.6 billion is broken out into an industry-by-industry impact ordered by added income. Table 3 outlines the top industries impacted by UIC. Because industries have different jobs-to-sales ratios, the associated jobs supported by UIC differ by impact. Nonetheless, these are impacts that would not have been generated without the university's presence.

FIGURE 1: UIC alumni working in-state today

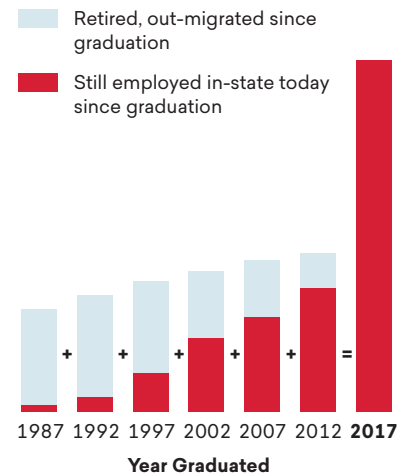


TABLE 3: Top industries impacted by UIC

| TOTAL INCOME (MILLIONS) | JOBS |
|-----------------------------------|---------------|
| \$1,417.3 | 16,602 |
| Health Care & Social Assistance | |
| \$1,021.0 | 3,198 |
| Manufacturing | |
| \$974.3 | 9,311 |
| Professional & Technical Services | |
| \$421.2 | 1,978 |
| Finance & Insurance | |
| \$370.9 | 3,697 |
| Government, Non-Education | |
| \$3,433.4 | 38,773 |
| All other industries | |
| \$7,638.1 | 73,559 |
| 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 and considered profitable.

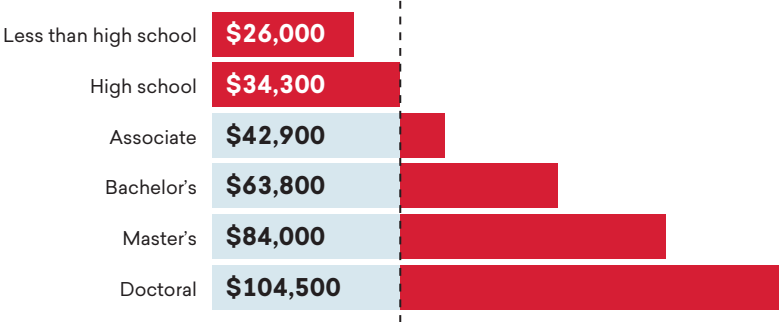
This study considers UIC as an investment from the perspectives of students and society. In addition, the benefits received by state and local taxpayers is measured. The backdrop for the analysis is the entire Illinois economy.

STUDENT PERSPECTIVE

In FY 2017, UIC served 31,879 students. In order to attend college, students paid for tuition, fees, books, and supplies. They also took out loans and will incur interest on those loans. Additionally, students gave up money that they would have otherwise earned had they been working instead of attending college. The total investment made by UIC’s students for FY 2017 amounted to a present value of \$629.1 million, equal to \$410.4 million in out-of-pocket expenses (including future principal and interest on student loans) plus \$218.7 million in forgone time and money.

In return for their investment, UIC’s students will receive a stream of higher future earnings that will continue to grow through their working lives. As shown in Figure 2, mean earnings levels at the midpoint of the average-aged worker’s career increase as people achieve higher levels of education. For example, the annual earnings of a bachelor’s degree graduate from UIC will average \$29,500 higher than someone with a high school diploma or equivalent working in Illinois. Over a working lifetime, this increase in earnings amounts to an undiscounted value of approximately \$1.3 million in higher earnings.

FIGURE 2: Average earnings by education level at career midpoint in Illinois



Source: Emsi complete employment data.



The present value of the higher future earnings that UIC's students will receive over their working careers is \$3.3 billion. Dividing this value by the \$629.1 million in present value student costs yields a benefit-cost ratio of 5.3. In other words, for every \$1 students invest in UIC in the form of out-of-pocket expenses and forgone time and money, they receive a cumulative of \$5.30 in higher future earnings. The average annual rate of return for students is 16.5%. This is an impressive return, especially when compared to the 30-year average 10.1% return to the U.S. stock market (Figure 3).

TAXPAYER PERSPECTIVE

In FY 2017, taxpayers invested in the University of Illinois System. In return for their investment, taxpayers will receive benefits from each of the University of Illinois universities, including UIC. Benefits to taxpayers consist primarily of taxes that the state and local government will collect from the added revenue created in the state. As UIC students earn more, they will make higher 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 2017 students' working careers, the state and local government will have collected a present value of \$1.2 billion in added taxes.

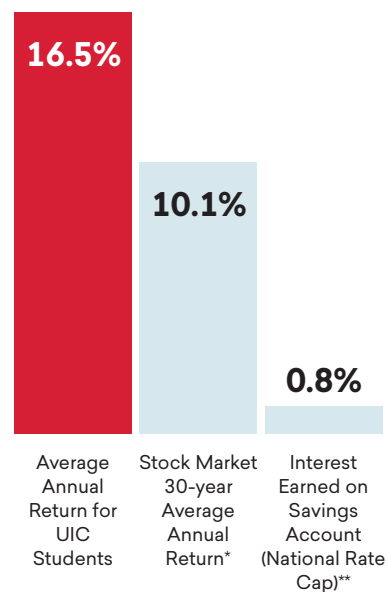
Benefits to taxpayers consist of the savings generated by the typical lifestyles of students and the proportionally reduced government expenditures. Education is statistically correlated with a variety of lifestyle changes that generate taxpayer savings across three main categories: 1) health, 2) crime, and 3) unemployment. Improved health habits lower the students' demand for 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 university for a copy of the main report. All of these benefits will generate a present value of \$59.1 million in savings to state and local taxpayers. Total benefits to taxpayers equal \$1.3 billion, equal to the sum of the added taxes and public sector savings.

SOCIAL PERSPECTIVE

Society as a whole within Illinois benefits from the presence of UIC 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 Illinois 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 cor-

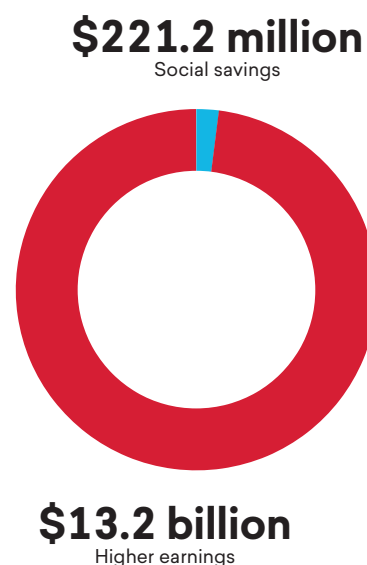
FIGURE 3: Student rate of return



* Forbes' S&P 500, 1987-2016.

** FDIC.gov, 7-2017.

FIGURE 4: Present value of higher earnings and social savings in Illinois



related 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 insurance savings include the reduced employer contributions towards unemployment claims. For a list of study references to these statistical benefits, please contact the university for a copy of the main report.

Figure 4, on the previous page, shows the present value of the higher earnings and social savings that will occur in Illinois over the working lifetime of the FY 2017 student population at UIC. Higher earnings amount to a present value of \$13.2 billion due to the increased lifetime earnings of students and associated increases in business output. Social savings amount to \$221.2 million, the sum of health, crime, and unemployment savings in Illinois. Altogether, total benefits to society equal \$13.5 billion (in present value terms).

Society invested a present value of \$2.3 billion for FY 2017 UIC educations. This includes all expenditures by UIC, all student expenditures, and all student opportunity costs. For every dollar of this investment, society as a whole in Illinois will receive a cumulative value of \$5.80 in benefits, equal to the \$13.5 billion in benefits divided by the \$2.3 billion in costs. These benefits will occur for as long as UIC's FY 2017 students remain employed in the state workforce.

TABLE 3: Summary of investment analysis results

| | STUDENT PERSPECTIVE | TAXPAYER PERSPECTIVE* | SOCIAL PERSPECTIVE |
|-------------------------------------|---------------------|-----------------------|--------------------|
| Present value benefits (millions) | \$3,337.20 | \$1,262.60 | \$13,461.90 |
| Present value costs (millions) | \$629.10 | | \$2,307.00 |
| Net present value (millions) | \$2,708.00 | | \$11,154.90 |
| Benefit-cost ratio | 5.3 | | 5.8 |
| Rate of return | 16.5% | | N/A* |

* Because the University of Illinois System receives the taxpayer funding and controls the funding structure for the individual universities, measuring a benefit-cost ratio and rate of return is not appropriate for the taxpayer perspective. 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 UIC creates value from multiple perspectives. The university benefits local businesses by increasing consumer spending in the state 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 and local 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 Illinois 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 2017 academic and financial reports from the University of Illinois System, 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 UIC for a copy of the main report.



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