University of Illinois System

Altogether Extraordinary™

Analysis of the Economic Impact and Return on Investment of Education

THE ECONOMIC VALUE OF THE UNIVERSITY OF ILLINOIS SYSTEM

August 2018



EXECUTIVE SUMMARY

Emsi

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UNIVERSITY OF ILLINOIS SYSTEM



Executive summary

The University of Illinois System (the U of I System) creates value in a variety of ways. The universities improve higher education delivery throughout the state and help students increase their employability and potential. The U of I System 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 the U of I System influences both the lives of students and the state economy. The universities serve a range of industries in Illinois, support state businesses, and benefit society as a whole in Illinois from an expanded economy and improved quality of life. The benefits created by the U of I System even extend to the state and local government through increased tax revenues and public sector savings.

This study investigates the economic impacts created by the U of I System on the business community and the benefits that the universities generate in return for the investments made by their key stakeholder groups—students, taxpayers, and society. For the purposes of this study, the universities' service region is the state of Illinois. 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, taxpayers, and society are reported under the investment analysis. Both analyses are described more fully in the subsequent sections.

Economic impact analysis

The U of I System promotes economic growth in Illinois through its direct expenditures and the resulting expenditures of students, visitors, and state businesses. The universities serve as employers and buyers of goods and services for their academic, research, and hospital operations. Numerous start-up and spin-off companies have formed through programs and knowledge at the universities. The universities' reputation and activities attract students and visitors from outside Illinois, whose expenditures benefit state vendors. The universities are primary sources of education to Illinois residents and suppliers of trained workers to the state industries, increasing overall productivity in the state workforce.

OPERATIONS SPENDING IMPACT

The U of I System is an important employer in Illinois. In FY 2017, the universities employed 26,607 full-time and part-time faculty and staff (not including research and hospital employees). Of these, 98% lived in Illinois. Total payroll at the U of I System was $2.8 billion (excluding payroll from research and hospital employees), much of which was spent in the state for groceries, rent, dining, clothing, and other household expenses.

The U of I System is a large-scale buyer of goods and services. In FY 2017 the universities spent $1.3 billion to cover their expenses for facilities, professional services, and supplies, excluding research and hospital expenditures.

The U of I System added $3.7 billion in income to the state economy during the analysis year as a result of its day-to-day operations. This figure represents the universities' payroll, the multiplier effects generated by the spending of the universities and their employees, and a downward adjustment to account for funding that the universities received from state and local sources. The $3.7 billion in added income is equivalent to supporting 37,749 jobs.

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, the U of I System spent $468.7 million on payroll to support research activities. This, along with $548.9 million in other research spending, created a net total of $1.2 billion in added income for the state economy. This added income is equivalent to supporting 12,710 jobs.

Over the last four years, the U of I System received 1,490 invention disclosures, filed 544 new U.S. patent applications, and produced 376 licenses. Total license

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.

LEADERS IN INNOVATION

The University of Illinois System attracts the nation's most talented students and faculty to programs ranked among the best in the United States. Through interdisciplinary research, corporate and public partnerships, and forward-thinking, and supported by federal, state, and private research funding, the talent from the system's three universities is pioneering innovation across countless fields of study each and every day.

income over the same four-year time period grew from $29.4 million in FY 2013-14 to $31.1 million in FY 2017, an approximate $1.8 million increase.

TABLE 1: Research Developments created by the U of I System

	INVENTIONS	PATENTS	LICENSES
2013-14	349	144	90
2014-15	374	142	84
2015-16	377	114	100
2016-17	390	144	102
total	**1,490**	**544**	**376**

HOSPITAL SPENDING IMPACT

The University of Illinois Hospital & Health Sciences System (UI Health) would not exist without the U of I System. The hospital 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 known for providing quality patient care.

In FY 2017, $1.1 billion was spent on UI Health 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 AND SPIN-OFF COMPANY IMPACT

The U of I System creates an exceptional environment of discovery that fosters innovation and entrepreneurship, evidenced by the number of start-up and spin-off companies related to the universities created in Illinois. In FY 2017, start-up and spin-off companies related to the U of I System added $678.9 million in income to the Illinois economy, which is equivalent to supporting 2,683 jobs. Of this added income, $519.5 million was due to the start-up companies, with the remainder due to spin-off companies.

STUDENT SPENDING IMPACT

Around 31% of graduate and undergraduate students attending the U of I System originated from outside the state in FY 2017, and some of these students relocated to Illinois to attend the universities. These students may not have come to the state if the universities 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 the U of I System. While attending the universities, these relocated and retained students spent $347.5 million to purchase groceries, rent accommodation, pay for transportation, and so on. A significant portion of these expenditures occurred in the state, generating $305.7 million in added income in the state economy during the analysis year, which is equivalent to supporting 5,853 jobs.

TABLE 2: Impacts created by the U of I System in FY 2017

ADDED INCOME	JOBS
$3.7 billion	**37,749**
Operations spending impact	
$1.2 billion	**12,710**
Research spending impact	
$1.5 billion	**14,348**
Hospital spending impact	
$678.9 million	**2,683**
Start-up and spin-off company impact	
$305.7 million	**5,853**
Student spending impact	
$39.7 million	**875**
Visitor spending impact	
$10.1 billion	**97,125**
Alumni impact	
$17.5 billion	**171,342**
Total impact	

COMMITTED TO ACCESS

The University of Illinois System is committed to improving opportunities for a diverse population to access to an affordable, world-class public education. They system is holding costs down by freezing tuition, increasing the number of available scholarships, adding new transfer agreements with community colleges, and offering more on-line and non-traditional learning opportunities.

VISITOR SPENDING IMPACT

Hundreds of thousands of visitors from outside the state were attracted to the universities during the analysis year to attend commencement, cultural and sporting events, and other activities sponsored by the universities. While in the state, visitors spent money for lodging, food, transportation, and other personal expenses. The off-campus expenditures of the universities' out-of-state visitors generated a net impact of $39.7 million in added income for the state economy in FY 2017. This $39.7 million in added income is equivalent to supporting 875 jobs.

ALUMNI IMPACT

The education and training the universities provide for state residents results in the greatest impact. As shown in Figure 1, since the universities were established, students have studied at the U of I System and entered the state workforce with new skills. Today, hundreds of thousands of former students are employed in Illinois.

During the analysis year, past and present students of the U of I System generated $10.1 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 $10.1 billion in added income is equivalent to supporting 97,125 jobs.

TOTAL IMPACT

The overall impact of the U of I System on the state business community during the analysis year amounted to $17.5 billion in added income, equal to the sum of the operations spending impact, the research spending impact, the hospital spending impact, the start-up and spin-off company impact, the student spending impact, the visitor spending impact, and the alumni impact. The $17.5 billion in added income was equal to approximately 2.2% of the gross state product of Illinois. By comparison, this contribution that the universities provide on their own is almost as large as the entire Accommodation & Food Services 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 $17.5 billion impact supports 171,342 jobs. For perspective, with 7.8 million jobs in the state, this means that one out of every 46 jobs in Illinois is supported by the activities of the universities and their students.

A portion of the total $17.5 billion is broken out into an industry-by-industry impact ordered by added income. Table 3 outlines the top industries impacted by the U of I System. Because industries have different jobs-to-sales ratios, the associated jobs supported by the U of I System differ by impact. Nonetheless, these are impacts that would not have been generated without the universities' presence.

FIGURE 1: U of I System alumni working in-state today

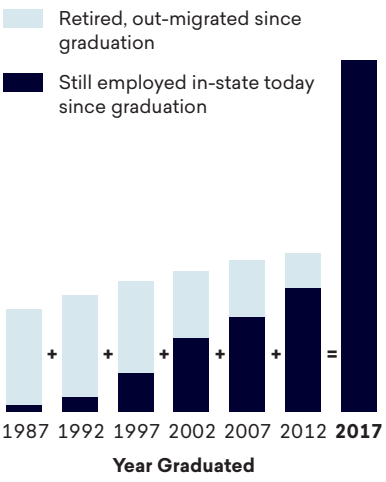


TABLE 3: Top industries impacted by the U of I System

TOTAL INCOME (MILLIONS)	JOBS
$2,889.2	**28,203**
Professional & Technical Services	
$2,495.4	**8,812**
Manufacturing	
$1,813.3	**23,583**
Health Care & Social Assistance	
$982.2	**4,527**
Finance & Insurance	
$917.6	**9,218**
Government, Non-Education	
$8,449.2	**96,998**
All other industries	
$17,546.8	**171,342**
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.

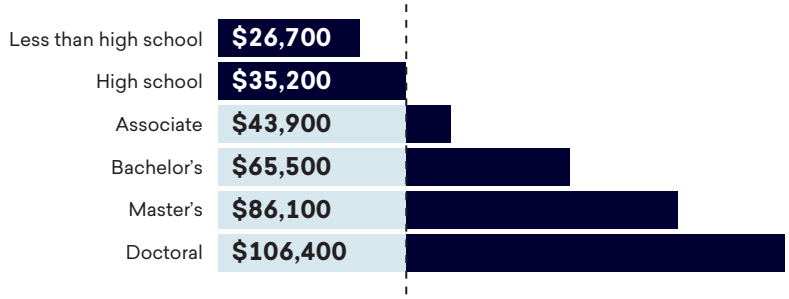
The U of I System received a total of $5.5 billion in FY 2017. Tuition and fees comprised 22% of total revenue, student aid from government sources comprised another 40%, and all other revenue comprised the remaining 38%. This study considers the U of I System as an investment from the perspectives of those whom provided these revenues - students, taxpayers, and society. The backdrop for the analysis is the entire Illinois economy.

STUDENT PERSPECTIVE

In FY 2017, the U of I System served 89,354 credit students and 139 non-credit 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 U of I System students for FY 2017 amounted to a present value of $2.1 billion, equal to $1.3 billion in out-of-pocket expenses (including future principal and interest on student loans) plus $807.4 million in forgone time and money.

In return for their investment, U of I System 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 the U of I System will average $30,300 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.

ADDRESSING GLOBAL CHALLENGES

With the best and brightest minds and world-class resources at their fingertips, the University of Illinois System's universities are poised to solve society's biggest challenges.

ADVANCING HEALTH

Cancer. Diabetes. Sickle Cell. HIV. New breakthroughs in these and other diseases are happening right now, across the U of I System. From new technology, to new treatments, to advanced pharmaceuticals, to discoveries in mental health—system faculty and researchers are advancing the health of a global population.

The present value of the higher future earnings that the U of I System's students will receive over their working careers is $10.4 billion. Dividing this value by the $2.1 billion in present value student costs yields a benefit-cost ratio of 5.0. In other words, for every $1 students invest in the U of I System in the form of out-of-pocket expenses and forgone time and money, they receive a cumulative of $5.00 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 30-year average 10.1% return to the U.S. stock market (Figure 3).

TAXPAYER PERSPECTIVE

The U of I System generates more in tax revenue than it collects. These benefits to taxpayers consist primarily of taxes that the state and local government will collect from the added revenue created in the state. As U of I System 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 $3.4 billion in added taxes.

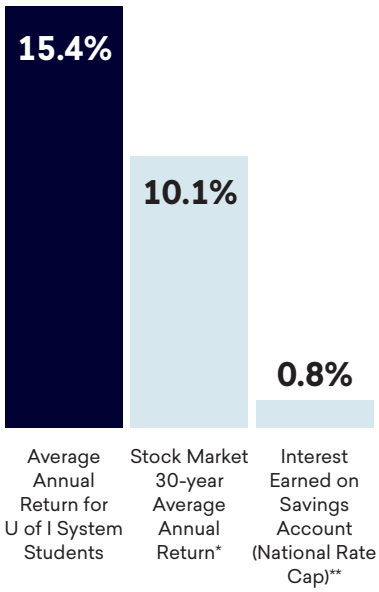
Benefits to taxpayers consist of the savings generated by the typical lifestyles of students and the proportionally reduced government expenditures. Education is statistically correlated with a variety of lifestyle changes that generate taxpayer savings across three main categories: 1) health, 2) crime, 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 U of I System for a copy of the main report. All of these benefits associated with increased education will generate a present value of $170.3 million in savings to state and local taxpayers.

Total benefits to taxpayers equal $3.6 billion, equal to the sum of the added taxes and public sector savings. Comparing this to the taxpayer costs of $1.5 billion—equal to the funding that the U of I System received from the state and local government during the analysis year—yields a benefit-cost ratio of 2.4. This means that for every $1 of public money invested in the U of I System, taxpayers receive a cumulative value of $2.40 over the course of the students' working lives. The average annual rate of return is 6.4%, 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 Illinois benefits from the presence of the U of I System 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.

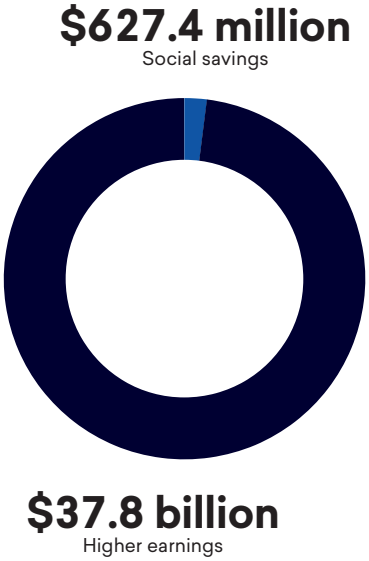
FIGURE 3: Student rate of return



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

** FDIC.gov, 7-2017.

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



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 insurance savings include the reduced employer contributions towards unemployment claims.

Figure 4 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 the U of I System. Higher earnings amount to a present value of $37.8 billion due to the increased lifetime earnings of students and associated increases in business output. Social savings amount to $627.4 million, the sum of health, crime, and unemployment savings in Illinois. Altogether, total benefits to society equal $38.4 billion (in present value terms).

Society invested a present value of $6.1 billion for FY 2017 educations at the U of I System. This includes all expenditures by the U of I System, 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 $6.30 in benefits, equal to the $38.4 billion in benefits divided by the $6.1 billion in costs. These benefits will occur for as long as the U of I System's FY 2017 students remain employed in the state workforce.

SUMMARY OF INVESTMENT ANALYSIS RESULTS

Table 4 presents the results of the investment analysis for all three of the U of I System'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 and local taxpayers to the universities creates a wide range of benefits to society and returns more to government budgets than it costs.

TABLE 4: Summary of investment analysis results

	STUDENT PERSPECTIVE	TAXPAYER PERSPECTIVE	SOCIAL PERSPECTIVE
Present value benefits (millions)	**$10,449,192**	**$3,574,079**	**$38,389,743**
Present value costs (millions)	**$2,091,793**	**$1,462,545**	**$6,131,541**
Net present value (millions)	**$8,357,399**	**$2,111,534**	**$32,258,203**
Benefit-cost ratio	**5.0**	**2.4**	**6.3**
Rate of return	**15.4%**	**6.4%**	**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 the U of I System creates value from multiple perspectives. The universities benefit local businesses by increasing consumer spending in the state and supplying a steady flow of qualified, trained workers into the workforce. They enrich the lives of students by raising their lifetime earnings and helping them achieve their individual potential. They benefit state and local taxpayers through increased tax receipts across the state and a reduced demand for government-supported social services. Finally, they benefit 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 U of I 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 the U of I System for a copy of the main report.

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