

The Undergraduate College Education in Selected Midwest States: Schools with Best and Worst ROI

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Abstract: This study examined the ROI, total 4-year education cost, graduation rate and average loan amount for undergraduate education in schools of five selected Midwestern States. The results indicate that students in Michigan enjoyed highest mean ROI (5.79%) accompanied with minimum standard deviation of 2.09% over 20-year period. The highest annual median income of 5.46% is also reported by the schools in Michigan. University of Notre Dame produces the highest graduation rate of 95 percent in this group. Graduates of Michigan Technological Institute (In-State) enjoyed highest ROI of 10.62 percent over 20-years period of study.

Key words: ROI; Midwestern States; undergraduate education

JEL codes: I2

1. Introduction

The cost of an undergraduate college education has been rising each year. The basic economic question is the time required to pay back educational debt after entering the workforce in USA. Allie Bidwell (February 2015) writes “It’s a strange paradox. At a time when Americans overwhelmingly say it’s important to receive a college education, their faith in the economic value of the investment is slipping, new research shows. A survey of more than 2,000 adults — 900 of whom were college graduates — released Tuesday by education technology company Greenwood Hall, shows more than half of graduates say those leaving college with a degree now will see a lower return on their education investment than those 10 to 15 years ago. Simply put, while the cost of college continues to rise and the economy is slowly coming out of the Great Recession, today's graduates might not get as much bang for their buck.”

Students may have piled a huge education debt loan upon graduation. 70% of graduating seniors will enter the workforce with an average student loan debt of \$29,400 (Carrie Sealy-Morris, 2016). Hence, the question of ROI on college education is very important for graduates. ROI for a college degree is different than ROI of an investment/project due to opportunity costs; like students’ time, working possibilities, and lost entertainments. In addition, students also have to study continuously and go through stress and pressure of regular assignments and exams. Thus, ROI on college education may be different than business’s ROI.

Carrie Sealy-Morris (2016) writes “There are a lot of factors to take into consideration. You invest a lot more

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than just money into a college education — you invest time, work, and stress. That makes college fundamentally different from many other investments. ROI could be as simple as what income people make vs. what they paid for college and what they owe in student debt, but that is still too simple. Income isn't necessarily a measure of success, and student loan debt could just mean you took out more loans than you needed, not that the school was too expensive. While some short sighted people just want to know how much money they can make straight out of school, others want a certain level of long-term career satisfaction. Neither is wrong.”

Studies like PayScale's help would-be students (and their parents) make more informed choices. As Americans start to realize how much a bad choice can hurt them, they will demand more transparency. Some colleges are providing it, prodded by the federal government. For example, the University of Texas recently launched a website showing how much its graduates earn and owe after five years (The Economist: Higher Education-6).

In the past, college education used to lead to better, brighter, and financially lucrative professional careers. However, in the present times, undergraduate education may not act as a ticket to better careers but may also result in significant educational loans upon graduation. According to the Federal Reserve Bank of New York, 44 percent of recent college graduates are underemployed — working in jobs that don't require their degree — as of 2012 (PayScale College ROI Report: Best Value Colleges: www.payscale.com/college-roi).

In spite of numerous articles printed in magazines, academic journals lack the analytical research on this topic. Therefore, this study is an initial step to analyze ROI and other factors relevant to students' educational goals from an academic point.

2. Data and Methodology

The data is collected from information collected by Payscale.com's list of ROI rankings. Payscale.com website provides useful information on ROI and other factors important to college graduates. PayScale.com administers the largest real-time salary survey in the world with more than 150,000 new survey records added every month. The database of more than 54 million total salary profiles is updated nightly to reflect the most detailed, up-to-date compensation information available. Payscale.com data collection is strongly correlated with the size of the pool being considered, representing the diversity of the general workforce.

Both in-State and out-of-State educational institutions are included in this study. The following four variables (factors) are analyzed in this study:

(1) Total 4-Year Cost (Principal Amount Invested): Full cost including tuition & fees, room & board and books & for a 2014 graduate. Actual net cost may vary based on a student's academic success and family income. Source: IPEDS. This variable is analyzed separately and is also used in computing ROI.

20 Years ROI (Gain in Dollars over 20 Years Period after graduation): Difference between 20 years Median Pay for a bachelor's grad and 24 year Median pay for a high school grade minus total 4-year cost. This variable is not analyzed separately but is used in computing ROI.

(2) Graduation Rate: Percent of full-time, first-time degree seeking undergraduate students who began their studies at the given school and graduate within 6 years (IPEDS).

(3) Average Loan Amount: Received by full-time, first time degree seeking undergraduate students for the 2012-2013 school year, multiplied to represent amount over 4 years. Includes all Title IV loans and all institutionally and privately-sponsored student loans (IPEDS)

(4) Annualized Return on Investment (ROI) Formula

$$\text{Annual Percentage Yield (APY)} = (\text{principal} + \text{gain} / \text{principal})^{(1/\text{years})} - 1$$

For example:

Look at Michigan State University (Out-of-State education)

20-Year Net ROI = \$331,700 (Gain over 20-years period)

Total 4-Year Cost = \$171,300 (Principal)

$$\text{APY} = (\$503,000 / \$171,300)^{(1/20)} - 1 = 2.9363^{0.05} - 1 = 1.0553 - 1 = 5.53\%$$

Thus, ROI for Michigan State University (Out-of-State) is 5.53% over a period of 20-years after graduation and entering the workforce.

The data is collected for 182 educational institutions for five selected Midwestern State from USA. However, incomplete data for 10 schools was dropped thereby reducing dataset to 172 schools. Indiana was selected as the State below Lake Michigan. After that, additional four States bordering Indiana (Michigan, Ohio, Kentucky and Illinois) were selected for analysis.

3. Results

3.1 Schools in Five Selected Midwestern States

Data for 172 schools among five States is used and incomplete data for ten schools is excluded from this analysis. The results reported in Table 1 indicate that the mean ROI of 4.99 percent over twenty-years period for five States and a standard deviation of 2.36 percent. Median annual income for this group is found to be 5.16 percent.

Table 1 Undergraduate College Degree's Return on Investment for Selected Five Midwestern States

	Mean	Standard Deviation	Median
Annual ROI	4.99%	2.36%	5.16%
Total 4 Year Cost	\$134,626	\$40,461	\$132,250
Graduation Rate	55.78%	16.85%	57.00%
Average Loan Amount	\$28,890	\$4,472	\$28,360
For the Group	Name of School		Value
Maximum Annual ROI	Michigan Technological University (In-State)		10.62%
Minimum Annual ROI	Ashland University (Private)		-3.30%
Maximum Total 4 Year Cost	University of Chicago (Private)		\$245,000
Minimum Total 4 Year Cost	Morehead State University (Kentucky) (In-State)		\$71,100
Maximum Graduation Rate	University of Notre Dame (Private)		95.00%
Minimum Graduation Rate	Baker College - Flint, MI (Private)		11.00%
Maximum Average Loan Amount	Kettering University(Private)-MI		\$45,600
Minimum Average Loan Amount	IPFW(both In-State a& Out-of-State)		\$20,960
Total Number of Schools	172*		
* Data for additional 10 schools was incomplete and hence dropped from the analysis			

Graduates from Michigan Technological University (In-State) earned highest annual ROI of 10.62 percent per year for 20 years, while Ashland University (Private) of Ohio's graduates earned an average ROI of -3.30%. Cost of undergraduate education for students at University of Chicago (Private) is \$245,000 while \$71,000 is the lowest educational cost for students at Morehead State University Kentucky (In-State).

University of Notre Dame produced highest graduation rate of 95 percent for the undergraduate students,

while students at Baker College Flint MI were graduating at the lowest rate of 11 percent during the study period. Students at Kettering University (Private) took the highest loan of \$45,600 during their undergraduate educational life. On the other side, students at Indiana University-Purdue University Fort-Wayne (both In-State and Out-of-State) were able to graduate with a minimum average loan of \$20,600 only.

3.2 Schools in Illinois

Complete data of 41 schools in Illinois is analyzed and incomplete data for three schools is excluded. The results of this study are reported in Table indicate that the mean annual ROI for undergraduate education in Illinois is 4.53 percent over the last twenty-years period with a standard deviation of 2.09 percent. Median annual income over the same period is found to be 4.47 percent. Both these percentages are below average for five States group indicating that mean ROI is lower with a tighter probability distribution

Graduates from University of Illinois at Urbana–Champaign (In-State) earned the highest annual ROI of 9.31 percent per year for 20 years, while School of the Art Institute of Chicago’s (Private) graduates earned an average ROI of 0.54%. Comparison of total 4-year cost of education reveals that students of University of Chicago (Private) spent a total of \$245,000 while the total cost of education (\$91,700) is cheapest at Southern Illinois University Edwardsville Campus (In-State). Both highest and lowest costs of education in Illinois are higher than the corresponding highest and lowest costs of education among remaining four states of the group indicating that the cost of education in Illinois is higher.

Northwestern University (Private) produced highest graduation rate of 94 percent for the undergraduate students, while students at Chicago State University (both In-State and Out-of-State) were graduating at the lowest rate of 21 percent during the study period. The students at School of Art Institute of Chicago (Private) took the highest loan of \$37,960 during their undergraduate educational life. Students at Northwestern University (Private) were able to graduate with a minimum average loan of \$23,200 only. This shows that Northwestern University (Private) produces highest graduation rate and students also enjoy lowest educational loan at the same school. On contrary, the results also show that School of Arts Institute of Chicago delivers lowest graduation rate and students also end up getting highest educational loan at the same school.

3.3 Schools in Indiana

Table 2 shows the results for schools in Indiana. Data for 30 schools is used and incomplete data of 3 schools is excluded.

The findings of this study indicate that the mean annual ROI for undergraduate education in Indiana is 5.19 percent over the last twenty-years period with a standard deviation of 2.17 percent. Median annual income for graduates of Indiana is 4.98 percent which is slightly smaller than the average for group of five States.

Graduates from Purdue University-Main Campus (In-State) earned the highest annual ROI of 10.59 percent per year for 20 years, while Anderson University (Private) of Anderson’s graduates earned an average ROI of 1.18. In Indiana, students at University of Notre Dame (Private) had to pay \$226,400 for 4-year education whereas, students at University of Southern Indiana (In-State) faced the cheapest 4-year educational expense of \$74,700.

Highest graduation rate of 95 percent was reported by University of Notre Dame (Private). Students of Indiana University-Purdue University (In-State and Out-of-State) and students of Indiana University South Bend (In-State and Out-of-State) were graduating at the lowest rate of 26 percent during the study period. Students at Rose-Hulman Institute of Technology (Private) had to take the highest educational loan of \$40,800. But, students at Indiana University-Purdue University (both In-State and Out-of-State) took the lowest loan of \$20,600 during their educational life.

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Table 2 Undergraduate College Degree's Return on Investment Across Schools in Indiana

	Mean	Standard Deviation	Median
Annual ROI	5.19%	2.17%	4.98%
Total 4 Year Cost	\$137,927	\$44,347	\$137,500
Graduation Rate	53%	20.80%	57.00%
Average Loan Amount	\$27,465	\$4,751	\$27,400
For the Group	Name of School		Value
Maximum Annual ROI	Purdue University - Main Campus (In-State)		10.59%
Minimum Annual ROI	Anderson University - Anderson, IN (Private)		1.18%
Maximum Total 4 Year Cost	University of Notre Dame (Private)		\$226,400
Minimum Total 4 Year Cost	University of Southern Indiana (In-State)		\$74,700
Maximum Graduation Rate	University of Notre Dame (Private)		95.00%
Minimum Graduation Rate	Indiana University-Purdue University - FW) (Both: In-State and Out-State)		26.00%
	Indiana University (IU) - South Bend (Both: In-State and Out-State)		
Maximum Average Loan Amount	Rose-Hulman Institute of Technology (RHIT) (Private)		\$40,800
Minimum Average Loan Amount	Indiana University-Purdue University - FW) (Both: In-State and Out-State)		\$20,960
Total Number of Schools	30*		

* Data for additional 3 schools was incomplete and hence dropped from the analysis

Thus, the findings of this study shows that, in Indiana, while University of Notre Dame produces highest graduation rate but the University also charges the highest educational cost from its graduates. A closer look at Tables 3-4 also indicates that colleges in Indiana region are second to colleges in Michigan as per ROI ranking.

Table 3 Undergraduate College Degree's Return on Investment Across Schools in Illinois

	Mean	Standard Deviation	Median
Annual ROI	4.53%	2.09%	4.47%
Total 4 Year Cost	\$150,498	\$38,890	\$154,600
Graduation Rate	57.77%	18.31%	57.00%
Average Loan Amount	\$28,548	\$4,056	\$29,200
For the Group	Name of School		Value
Maximum Annual ROI	University of Illinois at Urbana-Champaign (UIUC) (In-State)		9.31%
Minimum Annual ROI	School of the Art Institute of Chicago (Private)		0.54%
Maximum Total 4 Year Cost	University of Chicago (Private)		\$245,000
Minimum Total 4 Year Cost	Southern Illinois University (SIU) - Edwardsville Campus (In-State)		\$91,700
Maximum Graduation Rate	Northwestern University (Private)		94.00%
Minimum Graduation Rate	Chicago State University (CSU) (Both: In-State and Out-State)		21.00%
Maximum Average Loan Amount	School of the Art Institute of Chicago (Private)		\$37,960
Minimum Average Loan Amount	Northwestern University (Private)		\$23,200
Total Number of Schools	41*		

* Data for additional 3 schools was incomplete and hence dropped from the analysis

Table 4 Undergraduate College Degree's Return on Investment Across Schools in Kentucky

	Mean	Standard Deviation	Median
Annual ROI	4.74%	2.81%	5.42%
Total 4 Year Cost	\$104,371	\$27,069	\$108,200
Graduation Rate	46.93%	8.90%	44.00%
Average Loan Amount	\$26,371	\$5,324	\$24,240
For the Group	Name of School		Value
Maximum Annual ROI	University of Kentucky (UK) (In-State)		7.65%
Minimum Annual ROI	Morehead State University (Kentucky) (Out-of-State)		-1.99%
Maximum Total 4 Year Cost	Thomas More College (Private)		\$150,800
Minimum Total 4 Year Cost	Morehead State University (Kentucky) (In-State)		\$71,100
Maximum Graduation Rate	University of Kentucky (UK) (Both: In-State and Out-State)		62.00%
Minimum Graduation Rate	Northern Kentucky University (NKU) (In-State)		38.00%
Maximum Average Loan Amount	Sullivan University (Private)		\$42,400
Minimum Average Loan Amount	Morehead State University (Kentucky) (Both: In-State and Out-State)		\$22,480
Total Number of Schools	14*		
* Data for additional 0 schools was incomplete and hence dropped from the analysis			

3.4 Schools in Kentucky

This study's results for schools in Kentucky are reported in Table 4. Data for 14 schools is used and no school reported incomplete data. Mean annual ROI for undergraduate education in Kentucky is 4.74 percent over the last twenty-years period with a standard deviation of 2.81 percent. Median annual income is 5.429 percent which is smaller than national average.

Graduates from University of Kentucky (In-State) earned the highest annual ROI of 7.65 percent per year for 20 years, while Morehead State University (Out-of-State) graduates earned an average ROI of -1.99%. Students at Thomas More College (Private) ended up paying \$150,800 (highest) for their 4-years education as compare to the lowest educational expenses of \$71,100 at Morehead State University (In-State).

Graduates of University of Kentucky (both In-State and Out-of-State) enjoyed the highest graduation rate of 62 percent (which is lower than the highest graduation rate among the other our States). Students at Northern Kentucky University (In-State) had to settle with the lowest graduation rate of 38 percent. Students at Sullivan University (Private) took highest loan of \$42,400 whereas students of Morehead State University (both In-State and Out-of-State) were able to graduate with minimum educational loan of \$22,480.

3.5 Schools in Michigan

Table 5 shows the results of this study for schools in Michigan. Data for 40 schools is analyzed whereas incomplete data of 3 schools is excluded in this project.

Mean annual ROI for undergraduate education in Michigan is 5.79 percent over the last twenty-years period with a standard deviation of 2.09 percent. Both these percentages are better than five States analyzed in this paper indicating that mean ROI is higher with a tighter probability distribution. Median annual income is 5.46 percent (highest in five States).

Table 5 Undergraduate College Degree's Return on Investment Across Schools in Michigan

	Mean	Standard Deviation	Median
Annual ROI	5.79%	2.09%	5.46%
Total 4 Year Cost	\$118,800	\$34,811	\$109,350
Graduation Rate	52.35%	16.27%	49.00%
Average Loan Amount	\$27,916	\$4,701	\$26,800
For the Group	Name of School		Value
Maximum Annual ROI	Michigan Technological University (In-State)		10.62%
Minimum Annual ROI	Siena Heights University (Private)		1.70%
Maximum Total 4 Year Cost	University of Michigan - Ann Arbor (Out-of-State)		\$204,100
Minimum Total 4 Year Cost	Saginaw Valley State University (SVSU) (In-State)		\$73,000
Maximum Graduation Rate	University of Michigan - Ann Arbor (Both: In-State and Out-of-State)		90.00%
Minimum Graduation Rate	Baker College - Flint, MI (Private)		11.00%
Maximum Average Loan Amount	Kettering University (Private)		\$45,600
Minimum Average Loan Amount	Baker College - Flint, MI (Private)		\$21,040
Total Number of Schools	40*		
* Data for additional 3 schools was incomplete and hence dropped from the analysis			

Thus, the results reported in this analysis indicate that graduates from Michigan enjoyed highest return (both mean and median) with least risk among all five states studied.

Michigan Technological University (In-State) graduates were able to earn the highest annual ROI of 10.62 percent for 20-years period, while Siena Heights University (Private) graduates earned minimum ROI of 1.70%.

Both highest ROI and lowest ROI are higher than the corresponding highest ROI and lowest ROI for remaining four states of the group indicating that graduates from the State of Michigan enjoy highest ROI among five State analyzed.

In Michigan, students at University of Michigan Ann Arbor (Out-of-State) paid \$204,100 (highest) for their 4-years education as compare to the lowest educational expenses of \$73,000 were reported by Saginaw Valley State University (In-State). University of Michigan Ann Arbor (both In-State and Out-of-State) graduates enjoyed a graduation rate of 90 percent, while students of Baker College-Flint (Private) faced the lowest graduation rate of 11 percent (lowest in all five States). Kettering University (Private) students took the highest loan of \$45,600, while Baker College-Flint (Private) graduates were able to graduate with minimum educational loan of mere \$21,040.

Similar to University of Notre Dame in Indiana, University of Michigan Ann-Arbor also produces highest graduation rate in Michigan and charges highest educational cost from its graduates.

3.6 Schools in Ohio

Table 6 shows that data for 47 schools is used in this study while incomplete data of only one school is excluded. Mean annual ROI for undergraduate education in Ohio is 4.66 percent with a standard deviation of 2.67 percent. Median annual income is found to be 5.35 percent for graduates from Ohio.

University of Cincinnati (In-State) graduates received highest ROI of 8.47 percent while the lowest ROI of -3.30 percent belonged to the graduates of Ashland University (Private) which is also the lowest among group of

five States. Case Western Reserve University (Private) students faced highest educational cost of \$220,000 whereas students at Youngstown State University (In-State) were able to graduate with a minimum cost of \$80,000.

Table 6 Undergraduate College Degree's Return on Investment Across Schools in Ohio

	Mean	Standard Deviation.	Median
Annual ROI	4.66%	2.67%	5.35%
Total 4 Year Cost	\$141,153	\$39,049	\$137,200
Graduation Rate	56.65%	17.06%	58.00%
Average Loan Amount	\$30,174	\$4,767	\$29,140
For the Group	Name of School		Value
Maximum Annual ROI	University of Cincinnati (UC) (In-State)		8.47%
Minimum Annual ROI	Ashland University (Private)		-3.30%
Maximum Total 4 Year Cost	Case Western Reserve University (Private)		\$220,000
Minimum Total 4 Year Cost	Youngstown State University (YSU) (In-State)		\$80,000
Maximum Graduation Rate	Ohio State University - Main Campus (Both: In-State and Out-State)		83.00%
Minimum Graduation Rate	Shawnee State University (Both: In-State and Out-State)		27.00%
Maximum Average Loan Amount	Columbus College of Art And Design (Private)		\$45,200
Minimum Average Loan Amount	Shawnee State University (Both: In-State and Out-State)		\$23,520
Total Number of Schools	47*		
* Data for additional 1 schools was incomplete and hence dropped from the analysis			

Highest graduation rate of 83 percent is enjoyed by students of Ohio State University-Main Campus (both In-State and Out-of-State) while graduates at Shawnee State University (both In-State and Out-of-State) had to settle with the lowest graduation rate of 27 percent. Students of Columbus College of Arts and Design (Private) took an educational loan of \$45,200. In contrast, students at Shawnee State University (both In-State and Out-of-State) graduated with a minimum loan of \$23,520.

4. Conclusion

The results of this study indicate that students from Michigan enjoyed highest mean ROI (5.79) along with highest median ROI (5.46) and with the least risk (2.09% standard deviation of ROI) among all five selected Midwestern States regional analyzed over 20-year period. Schools in Indiana are second to colleges in Michigan as per ROI ranking. Students of Illinois colleges had to pay the highest educational cost (\$150,498) over the period of study but their graduation rate was still behind graduation rate in Michigan and Indiana. University of Notre Dame reports the highest graduation rate of 95 percent in the nation and the cost of education is highest for students of University of Chicago (Private).

References

- Allie Bidwell (2015). "College grads question how much a degree is worth: More than half of college graduates say new grads will see a lower return on their educational investment", *USA News*, February 10.
- "Best return on investment: The 50 colleges with the best return on investment in 2016", available online at: <http://www.bestcolleges.com/features/best-roi-colleges/>.

Carrie Sealey Morris (2016). "What's the ROI of a college degree? Value colleges", available online at: <http://www.valuecolleges.com/whats-the-roi-of-a-college-degree/>, Value Colleges.

Chris Kahn, "What Is the ROI of your college degree? Which jobs and degrees help you to pay off your student loans fastest? Find the ROI for your college degree," Bankrate.com, available online at: <http://www.bankrate.com/finance/college-finance/roi-college-degree.aspx>.

PayScale College ROI Report: Best Value Colleges, available online at: <http://www.payscale.com/college-roi>.

Payscale.com

"Is college worth it? Too many degrees are a waste of money. The return on higher education would be much better if college were cheaper", *The Economist: Higher Education*, Apr. 5th 2014, Chicago.

Troy Onink (2015). "Unless you're average, college ROI and best value rankings are misleading", *Forbes Contributor*, July 31.