A Holistic Approach to Calculating the Return on Investment of an Undergraduate Degree

A THESIS

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Abstract

The decision to pursue an undergraduate degree is one of the most important decisions a young adult will make in the United States of America. Between the choice of where to study and what to study there are thousands of options for students looking to further their education. This study will be a holistic look into the return on investment of thousands of undergraduate degrees in the United States. Specifically it will look into the relation between the financial return on investment and the non financial aspects of a college decision.

Keywords: College, College Decision, ROI, Non-Financial

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ON MY HONOR, I HAVE NEITHER GIVEN NOR RECEIVED UNAUTHORIZED
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I.   Introduction

In the United States of America, one of the most important decisions a young adult makes is whether to pursue an undergraduate degree. This decision has been studied by economists for years. After years of research it has become prevalent that not all degrees are created equal. The value of some majors and schools have substantially negative valued degrees financially, while others have significant financial returns. For potential students and parents of applicants, this is important information when deciding if and where a student attempts for an undergraduate degree. These statistics are also important for taxpayers because around 91% of the total student loans outstanding belong to the federal government.[1] As well as the students and taxpayers, these statistics are important to the institutions themselves in order to attract students.

It is common knowledge that people with an undergraduate degree have had significantly higher earning potential than people without one.[2] This is due to many factors. One being some of the highest paying jobs require skills that students acquire at higher education institutions. An example of this is a Computer science major. Computer science majors contribute to some of the highest returns on investment at most schools in the country.[3] Companies that employ these graduates traditionally would not hire someone without an undergraduate degree.

Another reason that students with undergraduate degrees have higher lifetime earnings is that the institutions are selective. They do not let everyone into their

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[1] Melanie Hanson, "Student Loan Debt Statistics", (EducationalData.org, November 17th, 2021)
[2] MeasureOne, "The MeasureOne Private Student Loan Report", (June 15th, 2021)
[3] Preston Cooper, "Is College Worth It? A Comprehensive Return on Investment Analysis", (2021)

institution. Therefore, they are able to choose talented individuals to attend their universities that would have high earnings potential regardless if they have an undergraduate degree or not. Selectivity is also why some students chose to attend specific institutions. In today's society people often pride themselves on the level of their education. Citizens also recognize that in today's job market it matters where your degree is from. Therefore, schools with high name recognition that are known for being selective hold more weight with employers.

While the lifetime return on investment of a degree is informative, there is more to an undergraduate degree than earnings potential. If earnings potential was all that went into the decision, everyone would be a computer science major at California Institute of Technology.[4] There are many limiting factors that prevent that from happening. Aside from being able to be accepted into the institution, a prospective student must also be able to afford it or be willing to take out a loan. After being accepted and being able to pay the cost of tuition, the student has to be able to complete the coursework attached with a computer science major at California Institute of Technology.

Whether an undergraduate degree has a financial return has also become a hot button issue with student loan debt in the country increasing by over 1 trillion since 2009.[5] Research has subsequently continued to put out studies about the return on investment of degrees. Terms like student loan forgiveness, which have become mainstream in political discussions, would mean that citizens that did not have the opportunity to attempt an undergraduate degree may have to help pay for other citizens' degrees in the form of tax dollars.

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[4] Preston Cooper, "Is College Worth It? A Comprehensive Return on Investment Analysis", (2021)
[5] Melanie Hanson, "Student Loan Debt Statistics", (EducationalData.org, November 17th, 2021)

Along with affordability and capability, a prospective student weighs many different characteristics of an institution before choosing to attend. This paper will illustrate those other characteristics. Examples of those characteristics are whether the institution has good sustainability practices or a great location. Some potential students discount criteria like those but for others they could be nonnegotiable.

This paper will go into many different reasons why prospective students choose specific institutions and majors. Prospective students and their parents can utilize studies like this one in order to make the most well informed educational decision possible. One thing this paper will attempt to unpack are the parts of a college decision that can not be measured numerically. Examples of this include extracurricular activities that the school offers, food, lodging, and social measurements. Prospective students look into these aspects of the school when they are deciding whether to attend because they can lead to enjoyment or fulfillment while attending the school. The four years that graduates spend attempting to attain an undergraduate degree, or five to six in some students' cases, are formative years. Students mature and develop preferences that will carry them into their adult life. Therefore, students are diligent when evaluating a school to attend for their undergraduate education.

This paper can also be used at the institutional level. Since many different characteristics go into the model, institutions will be able to see where they are coming through for their students and where they are falling short. Each institution has their own way of educating students, but most of them are invested in having fulfilled students. They do that by building an academic and social community for their students. This paper will examine the value of different aspects of college communities.

II.   Literature review

II. 1. The Economic Values of Higher Education

In the study (Porter, 2002) it was concluded that the rate of return on investment in higher education was high enough to warrant the financial burden associated with pursuing a college degree.[6] That means that on average college graduates earned more than high school graduates. According to another study (Day and Newburger, 2002) high school graduates earned an average of $1.2 million; associate's degree holders earned about $1.6 million; and bachelor's degree holders earned about $2.1 million.[7] In terms of an overall return on investment, the median bachelor's degree had a net ROI of $306,000.[8] The research that has been done in the field has also been diligent in terms of factoring in the risk of dropping out into the return on investment. Including the risk of dropping out, the ROI for the median bachelor's degree was only $129,000.[9]

Similar work was done in the study (Abel and Deitz, 2019). According to their findings, the average college graduate with just a bachelor's degree earned about $78,000 annually compared to $45,000 for the average worker with only a high school diploma.[10] While this "college wage premium" has changed over time, since 2000 it has stayed within a range of $30,000 to $35,000.[11] These studies and numbers help explain why so many high school students have believed it was imperative to attain education after high school. At the publishing of the paper, the return to college stood at 14%.[12]

[6] Kathleen Porter, "The Value of a College Degree", (2002)
[7] Jennifer Day, Eric Newburger, "The Big Payoff: Educational Attainment and Synthetic Estimates of Work-Life Earnings", (2002)
[8] Preston Cooper, "Is College Worth It? A Comprehensive Return on Investment Analysis", (2021)
[9] Preston Cooper, "Is College Worth It? A Comprehensive Return on Investment Analysis", (2021)
[10] Jaison Abel, Robert Deitz, "Despite Rising Costs, College is Still a Good Investment", (2019)
[11] Jaison Abel, Robert Deitz, "Despite Rising Costs, College is Still a Good Investment", (2019)
[12] Jaison Abel, Robert Deitz, "Despite Rising Costs, College is Still a Good Investment", (2019)

Research has continued to look at the return on investment of college degrees because the amount of student loan debt in the county has been continuing to increase. According to the Education Data Initiative, student loan debt in the United States was at $1.75 trillion in November of 2021.[13] The study also stated that the student loan debt grew 6 times faster than the nation's economy.[14] These numbers do not tell the full story for bachelors degrees because a fair share of the outstanding student loans have come from graduate education borrowing. With the national debt numbers where they have been, however, it explains why so much research has been done in the field of study.

Due to the rising student loan debt numbers and other factors, it has become commonplace for people to question the value of a college degree. The Bipartisan Policy Center, therefore, surveyed Americans and employers to see what the nation's sentiment was. They found that 60% of Americans still believed that a college degree was worth the time and money involved.[15] At the employer level, 87% believed that a college degree was "definitely" or "probably" worth the investment.[16] The findings in the survey also introduced differences between family history and annual income in terms of agreement on the value of a degree.

II. 2. The Economic Value of Some Degrees

While study after study has told high school graduates that an undergraduate degree was a great decision for their financial futures, research has begun to differentiate between the traditional return on investment of a college and the return on investment by

[13] Melanie Hanson, "Student Loan Debt Statistics", (EducationalData.org, November 17th, 2021)
[14] Melanie Hanson, "Student Loan Debt Statistics", (EducationalData.org, November 17th, 2021)
[15] Bipartisan Policy Center, "Is College Worth the Time and Money?", (September 2021)
[16] Bipartisan Policy Center, "Is College Worth the Time and Money?", (September 2021)

major and school. In a recent study (Cooper, 2021) the ROI for over 30,000 bachelors degrees was calculated. According to the study twenty-eight percent of bachelor's degree programs had negative ROI when adjusting for the risk of completion.[17] This was in line with research done by the Education Advisory Board (EAB) that found that 28% of people with a bachelor's degree were underemployed.[18] The EAB determined underemployed as college graduates ages 22-27 that were working jobs that did not require a college education.[19] Cooper's study became popular because it was one of the first studies to track such a large sample size over their lifetime earnings. Cooper was able to do this because the organization he worked for had clearance to use data from citizens w2's.

The Cooper study also determined some trends in terms of the returns of different degrees. For example engineering majors and computer science majors had high earnings while film or photographic arts majors had low wages.[20] These trends explained why studies in the past have traditionally shown that an undergraduate degree was a good financial investment. That was because, as Cooper explained, a computer science degree from the California Institute of Technology on average returned $4.4 Million dollars over a student's work lifecycle.[21] Figures like that heavily skewed the overall undergraduate degree returns. Another interesting trend that the Cooper study was able to demonstrate was that the major a student chooses was more important than the school a student chose in terms of return on investment. For example, a computer science degree at Harvard returned on average $3.3 Million over the work lifecycle.[22] An Anthropology degree from

[17] Preston Cooper, "Is College Worth It? A Comprehensive Return on Investment Analysis", (2021)
[18] Ed Venit, "What Happens to 100 Students Who Enter College?", (2018)
[19] Ed Venit, "What Happens to 100 Students Who Enter College?", (2018)
[20] Preston Cooper, "Is College Worth It? A Comprehensive Return on Investment Analysis", (2021)
[21] Preston Cooper, "Is College Worth It? A Comprehensive Return on Investment Analysis", (2021)
[22] Preston Cooper, "Is College Worth It? A Comprehensive Return on Investment Analysis", (2021)

Harvard, on the other hand, had a financial return of negative 152 thousand dollars, proving that attending a great school was not a golden ticket to great financial returns.[23]

Other studies have shown that the type of school a student attended also affected the return on investment. An example of a different degree was a Liberal Arts Degree. It was found that students viewed four aspects of the return on investment of their liberal arts degree.[24] Those four aspects were the credential of a college degree, the expectation of financial security, the expectation of career success, and the college experience.[25]

II. 3. Non-Financial Reasons to attempt an undergraduate degree

In another study (Shultz and Higbee, 2007) nine reasons were pinpointed as to why students decided to pursue an Undergraduate degree. Six of the reasons did not have to do with monetary gains from the degree. The six reasons were (1) a desire for education, learning, or knowledge; (2) personal goals to be well-rounded or for personal growth; (3) family goals or influences; (4) exposure to the college experience; (5) social aspects such as having fun or meeting new people; and (6) credentialing in the form of a college degree.[26] While these sentiments were only drawn from a selective student survey done for the study, they have predictive power for the general student body.

In another study (Moffatt,1991), Moffatt outlined two of the predominantly private pleasures of contemporary college life as friendship and sexuality.[27] These aspects of college life were hard to quantify but in Moffatt's study of Rutgers University they

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[23] Preston Cooper, "Is College Worth It? A Comprehensive Return on Investment Analysis", (2021)
[24] Laura Barrett, "Exploring the Return on Investment of a Liberal Arts Degree: Perceived Connections Between Education and Work", (2014)
[25] Laura Barrett, "Exploring the Return on Investment of a Liberal Arts Degree: Perceived Connections Between Education and Work", (2014)
[26]Jennifer Shultz, Jeanne Higbee, "Reasons for Attending College: The Student Point of View", (2007)
[27] Michael Moffatt, "College Life: Undergraduate Culture and Higher Education", (1991)

were prevalent. An example of this was the images of near-nude young adults of the opposite sex or pictures of celebrities that were on the walls of students' rooms.[28]

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[28] Michael Moffatt, "College Life: Undergraduate Culture and Higher Education", (1991)

III.   Methods

In order to evaluate the non-financial factors involved in the decision to attempt an undergraduate degree, our study used a utility function that incorporated the financial returns of a degree and the non-financial aspects of an undergraduate degree.

The utility function looked like:

$[U(W_{ij},N)]$

In the equation W_{ij} represented the lifetime return on investment where i was the specific institution and j was the specific program a student was enrolled in, while N represented the measurement for happiest students. We chose happiest students for the second half of the utility function because happiness has been well known as something that does not have a financial value. We believed that out of all of the characteristics that go into a college decision, whether students were happy was the most representative for the study.

Before we could run our model, we needed to address missing variables in our dataset to create worthwhile results. In order to do this we used the heckman technique to further populate our dataset with predicted values. More on this technique was discussed in the data section of the study.

In order to estimate the coefficients of our variables we used the conditional mixed-process (CMP) command on stata to run a multivariate probit model. The CMP command required two equations in order to run as well as indicators. The equations we used were as followed:

Equation 1

$$Wij = \beta1p + \beta2gqol + \beta3gcc + \beta4tfa + \beta5mlc + \beta6gcf + \beta7mbc + \beta8mpas + \beta9grci +$$

$$\beta10lgbtqf + \beta11gaf + \beta12gcn + \beta13gcrs + \beta14gct + \beta15gi + \beta16spts + \beta17gcd + \beta18gc$$

$$+ \beta19pa + \epsilon\gamma i + \epsilon\gamma p$$

Equation 2

$$N = \beta1p + \beta2gqol + \beta3gcc + \beta4tfa + \beta5mlc + \beta6gcf + \beta7mbc + \beta8mpas + \beta9grci + \beta$$

$$10lgbtqf + \beta11gaf + \beta12gcn + \beta13gcrs + \beta14gct + \beta15gi + \beta16spts + \beta17gcd + \beta18gc +$$

$$\beta19pa + \epsilon\gamma i + \epsilon\gamma p$$

The indicators we used for the study were continuous for the first equation and probit for the second equation. We used these indicators because the first equation we were solving for a continuous variable while the second equation we were solving for a variable that could only take two values.

IV.   The Data

Thanks to the work done by the foundation for research on equal opportunity (FREEOP), data for nearly 30,000 bachelors degrees nationwide were available to us in raw form. In these estimates FREEOP included four-year net tuition cost, four-year education-related spending, estimated earnings at 3 year intervals for each major up to age 64, and estimated counterfactual earnings at 3 year intervals for each major up to age 64. The FREEOP'S estimates also incorporated how long it took to graduate and drop out rates for the individual majors. These lifetime return on investment estimates served as the lifetime return on investment estimates we used in the study.

While these estimates were not perfect they were some of the most comprehensive return on investment calculations done to date. FREEOP leveraged information from the U.S. Department of Education's College Scorecard, the American Community Survey, the National Longitudinal Survey of Youth, and the Integrated Postsecondary Education Data System in order to populate their database.[29] The data they used were also up to date and relevant. FREEOP used the years 2009 through 2019 which excluded data collection during the Covid-19 pandemic, preventing unreliable estimates.[30]

One of the first things we did after we put all of the institutions, majors, and return on investment estimates into our new excel datasheet was create a peer group variable. The peer group variable was a tool we used in order to further evaluate schools similar to Colorado College. We felt this was important because while not all schools are

[29] Preston Cooper, "How We Calculated the Return on Investment of a College Degree", (2021)
[30] Preston Cooper, "How We Calculated the Return on Investment of a College Degree", (2021)

created equal, students tend to apply to similar types of schools. Therefore in order to account for the schools most like Colorado College we gave the top 40 ranked liberal arts schools (excluding the military academies) a 1 and all other institutions a 0. We also created two variables in order to effectively sort the colleges and programs. The program number represented all of the majors that institutions in the FREEOP study offer. The institution number represented all of the institutions in the FREEOP study. These rankings were taken from the US News and World Report 2022 rankings.

Another statistic we included in our dataset was the acceptance rate of each institution. This statistic was important because it matters to prospective students how selective an institution was when deciding to attend. We used the Online Education Directory in order to compile the acceptance rate of 571 institutions in the country. The 571 schools was the largest sample size we found on any single list done by reputable sources. In order to make up for the large amount of missing values, we used the heckman technique to create predictions for the schools missing from the Online Education Directory's list. Before the Heckman technique was used there were only 1,694 observations of admissions rates in the dataset. After the heckman technique was applied there were 29,699 predicted observations. It is important to note that the minimum value of our predicted admission rate was around 0 percent. Even the most selective schools have admissions rates well above 0 percent. We still included these predicted admissions rates even with these discrepancies from actual acceptance rates because we believed that admissions rates were a top reason students decide where to attend. Therefore, we believed an admissions rate not entirely accurate was more valuable to our study than not accounting for one at all.

In order to further evaluate circumstances that lead to students not potentially maximizing their earnings capabilities after graduation we also created a variable that accounted for institutions whose graduates go on to work for Teach for America. While this is just one example of a career choice that is not financially driven, we used it due to its popularity and representative qualities. The organization puts out lists every year with rankings of which institutions are contributing the most graduates. For each school mentioned on their rankings we gave them all a 1 in the dataset and for every school not on the list we gave them a 0. It is important to note that the list put out by Teach for America did not mention every school that has students go on to work for the organization, just the schools with the most contributors.

Along with these variables we used the lists from the Best Colleges 2022 Edition done by the Princeton Review to create more variables. The lists in the 2022 Edition were compiled by featuring schools that have frequently appeared on these lists in the past 62 years the survey has been around. This was done in order to account for students having a lack of access to campus last year during the Covid pandemic. Having a list that is representative of the last 62 years was beneficial for our study because it helped explain students' decisions on whether to attend the institution over a longer period of time.

The variables we created for the study were all separate lists featured in the Princeton Review 2022 Edition. We categorized the variables into three separate measurements. The first was the measurement of fulfillment at the institution. The second was attributes of the institutions themselves. The final was attributes of the social scene at the school. To create all of these variables we also used a binary scale of evaluating them.

If an institution was featured on one of the lists we assigned them a 1 and if they were not we assigned them a 0.

In the measurement of fulfillment section we used the lists Great Quality of Life, Most Loved Colleges and Happy Students. For the attributes of the institutions themselves we used the lists Great College City, Green Colleges, Great Campus Food, Most Beautiful Campus, Great Athletic Facilities, Great College Newspaper, Great College Radio Station, Great College Theater, Great Intramurals, and Great College Dorms. Then for the social scene we used the lists most Politically Active Students, Great Race/Class Interaction, LGBTQ-Friendly, and Students Pack the Stadium. These lists each represented reasons why students may choose an institution that does not involve return on investment in a financial sense. For example, it was difficult to put a numerical value on how much students gain or lose from going to an institution in the mountains like Colorado College. It was, however, a major reason why students attempt to attend the institution.

We included the summary statistics (table 1) in the study so readers could see the amount of observations we had for each variable. Since there are only 29,699 observations for lifetime return on investment, the Heckman technique only produced 29,699 observations for predicted admission rate. We also thought it was important to include our summary statistics in order to visually show the differences in our variables. The majority of our variables are binary while just a few are continuous. Also you were able to tell from the values of the means that the majority of the observations did not have values for most of the variables. Some of the means were larger than others because if a school that offered more programs was mentioned on a Princeton review list, more of the

observations were filled with 0's. Also if a data source we used acknowledged more

schools, the mean of the variable was larger. An example of this was the teach for

america variable. Since Teach for America acknowledged more schools than the

traditional Princeton review lists, it had the largest mean out of all of our binary variables.

Variable	Obs	Mean	Std. dev.	Min	Max
lifetimere~i	29,699	315922.8	478760.7	-995366	5411174
programnum~r	30,023	154.2199	85.5773	1	300
institutio~r	30,053	972.65	527.738	1	1789
peergroup	30,023	.015688	.1242674	0	1
predicted_~e	29,699	.1690422	.024923	.0044344	.3435582
teachforam~a	30,023	.0728442	.2598848	0	1
greatquali~e	30,023	.0188855	.136123	0	1
mostlovedc~s	30,023	.0196516	.1388022	0	1
happystude~s	30,023	.018286	.1339858	0	1
greatcolle~y	30,023	.0297439	.1698827	0	1
GreenC	30,050	.0603328	.2381063	0	1
greatcampu~d	30,023	.0169537	.1291	0	1
mostbeauti~s	30,023	.0117577	.1077952	0	1
greatathle~s	30,023	.0373713	.1896732	0	1
greatcolle~r	30,023	.0371715	.189185	0	1
greatcolle~n	30,023	.0215835	.1453214	0	1
greatcolle~e	30,023	.0122906	.1101813	0	1
greatintra~s	30,023	.030843	.1728951	0	1
greatcolle~s	30,023	.0154881	.1234858	0	1
mostpoliti~s	30,023	.0097925	.098473	0	1
greatracec~n	30,023	.0120574	.1091441	0	1
lgbtqfrien~y	30,023	.0127236	.1120808	0	1
studentspa~m	30,023	.0433668	.2036847	0	1

Table 1

<center>**V.   Results**</center>

As a result of our econometric model we found that out of the variables we decided to use, schools that offer great intramural sports contribute to the largest lifetime return on investment increase. The lifetime return on investment increase for schools with great intramural sports was $5,030,693. The following two variables that contributed to the largest lifetime return on investment were great college dorms and students that pack the stadiums at $3,272,038 and $2,083,623 respectively. The variable with the largest decrease in lifetime return on investment was most loved colleges at $-4,498,744.

There were ten total variables with positive increases in lifetime return on investment. Excluding the three already mentioned they were the peer group of Colorado College, great quality of life, most beautiful campus, lgbtq friendly, great athletic facilities, great college newspaper, students pack the stadiums, and green colleges. There were eight variables with decreases in lifetime return on investment. They were most loved colleges (mentioned before), great college city, teach for america, great campus food, most politically active students, great race/class relations, great college radio station, great college theatre, and predicted admission rate. All of these results can be seen in Table 2.

The study also found that, like studies in the past have shown, some majors have negative impacts on lifetime return on investment while others have positive ones. The highest lifetime return on investment coefficient for majors regarding computers was computer programming with a coefficient of about 0.145. The coefficient for lifetime return on investment for economics was about 0.011. The coefficient for liberal arts majors was also positive with a coefficient of about 0.009. One of the largest negative

coefficients in the study was veterinary biomedical and clinical sciences with about a

-0.55 coefficient. Another large negative coefficient was sociology and anthropology with

about a -0.15 coefficient.

The study also showed the effect the school themselves had on the lifetime return

on investment of a student. Colorado College had a negative coefficient for lifetime

return on investment. Harvard University also had a negative coefficient for lifetime

return on investment. Columbia University and Brown University, on the other hand, had

positive coefficients for lifetime return on investment at around $982,526 and $245,631

respectively. Bucknell University had a negative coefficient of -$491,263.

Lifetime Return on Investment	Coefficient	P>|t|	
Peer Group	719996.1	0.00	***
Great Quality of Life	671026	0.00	***
Great College City	-195008	0.00	***
Teach for America	-497820.1	0.00	***
Most Loved Colleges	-4498744	0.00	***
Great Campus Food	-4196539	0.00	***
Most Beautiful College Campus	1899386	0.00	***
Most Politically Active Students	-597959	0.00	***
Great Race/Class Relations	-2968335	0.00	***
LGBTQ Friendly	680994.2	0.00	***
Great Athletic Facilities	2003819	0.00	***
Great College Newspaper	473162.8	0.00	***
Great College Radio Station	-1454259	0.00	***
Great College Theatre	-2667456	0.00	***
Great Intramurals	5030693	0.00	***
Students Pack the Stadium	2083623	0.00	***
Great College Dorms	3272038	0.00	***
Green College	1340771	0.00	***
Predicted Admission Rate	-6.39E+07	0.00	***

Table 2

VI.   Implications:

These results can be a useful tool for high school students looking to pursue an undergraduate degree. Each student weighs characteristics of a school differently in their decision. The characteristics or variables of our study told an interesting story. For example, if you can get into and afford one of the top 40 liberal arts schools you were on average going to have a lifetime return on investment of over $700,000. On the other hand, if you decided to go to a school because it was recognized by the Teach for America Organization for having graduates in the program, on average you would have a lifetime return on investment of -$497,820.

By evaluating the results of the model, you can predict the value of certain degrees at certain institutions. For example, to find the expected lifetime return on investment for an economics major at Colorado College you would add up the coefficients of each of the effects we modelled. For this hypothetical Colorado College student you would add up the coefficient for Peer Group, Teach For America, Great Intramurals, Green College, Predicted Admitrate, Colorado College, and Economics. The result of that calculation was around $6.5 Million. High school students with an idea of what they want to study could perform this same calculation while they were evaluating the school.

This study could also help inform the federal government of the risk they take in regards to extending loans to students without requiring students know which major they are going to declare. If a student is majoring in computer programming, the student's future ability to repay a loan would on average be better than a student majoring in

veterinary biomedical and clinical sciences. Therefore the federal government could offer the student majoring in computer programming a lower interest rate on the loan. The federal government could also just not extend a loan to a student majoring in veterinary biomedical and clinical sciences.

The results of this study could also be important for the institutions themselves. If an institution strongly encourages their students to be politically active, that can be seen as a good thing. If encouraging students to be politically active leads to an average of over $500,000 lower in lifetime return on investment, it could affect the schools donation figures in the future.

VII.   Limitations:

This study had many limitations. The first being that there were so many different variables that go into making a college decision that we could never model all of them. Also, a lot of the factors that go into a college decision were not measurable. Therefore, we had to rely on the Princeton reviews rankings for the majority of our variables. Since the Princeton review is a trusted source in the college process, we felt confident using their results while we did not feel confident in other sources.

Another limitation of the study was the way the Princeton review did their rankings. Since they only highlight around 20 schools on most lists, it led to the majority of the schools in the dataset not having been listed once. Therefore it can be inferred that those schools' calculations were more random than the schools consistently being ranked by the Princeton Review. This lack of information led to some results that were skewed. An example of a result like this would be the Colorado College example from the Implications study. Since Colorado was mentioned a only a few of the Princeton review lists, the return on investment of an Economics degree was heavily weighted towards it being acknowledged on the list of having great intramurals. That variable ended up having one of the largest coefficients due to the schools on the list offering programs with high lifetime returns on investment

A third limitation of the study was the amount of time allotted for the study. The FREEOP study that was referenced earlier in this study took years to create. This study took just under 2 months, due to the way the Economics major at Colorado College is set

up. That means that there was lots more to tackle in terms of reasons students do not optimize their earnings potential. An example of this was ROTC programs. We planned on using whether the school has an Army ROTC program as another variable, but could not find a reliable source in the allotted time for the study.

Due to the lack of variables and reliable data, the second equation in the multivariate probit model did not run. It could not come up with reliable estimates for happiest students without more variables and more data. This was a set back in the study, but we believed it was still important to include that part of our model because a true model for college choice would include measurements of students' happiness. The data, unfortunately, was not comprehensive enough for the model to run.

VIII.   Conclusion:

To conclude, we decided to study this topic because of its prevalence in current economic research. We attempted to take a unique approach by incorporating the non-financial aspects of an undergraduate degree. This led to some results that were obviously not correct. It also led to some findings that we believed told a unique story regarding lifetime returns on investment for different institutions and programs. There was lots more that we could have tackled in this study and we encourage other economists to pick up where we left off in order to further the study of a holistic approach to the return on investment of a college degree.

IX.   Bibliography

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