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Using Institutional Characteristics to Estimate Return on College Education

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Abstract

Since the 1980s, the college wage-premium in the United States has reached all time highs. As a result, college education is a critical benchmark in securing high paying jobs. While the bachelor's degree serves as a gateway into more lucrative careers, postsecondary education can be very costly, with some taking on substantial amounts of debt to finance their schooling. Despite the increasing wage-premium, there is an even wider earnings disparity amongst college graduates than between graduates and non-graduates. Research on higher education returns suggests that most individuals – even those ranked as having low ability – benefit financially from their investment in education. At the institutional level; however, some schools produce median returns on investment that are well below zero. This begs the question, why are a considerable number of the nation's higher education institutions underserving their students? I use OLS to test the hypothesis that schools in rural settings displaced from major cities, and with religious affiliation will be critical variables in explaining college return on investment. My findings confirm that distance to major city, along with several other institutional characteristics are significant in explaining returns to higher education.

Keywords: college, institutional, return on investment

I. Introduction

Since the 1980s, the college wage premium has reached all time highs, making college education a virtually necessary stepping stone in attaining high paying careers (NBER, 2017). The Pew Research Center (2014) estimated that college graduates between the ages of 25 and 32 earn, on average, $17,500 more annually than their non-college educated peers, and that college graduates are better off in virtually every measure of economic and social wellbeing. Despite these clear benefits to attending college, the earnings gap between various college graduates is larger than the college-wage premium (Altonji, Kahn, & Speer, 2014). Highlighting this fact is a recent study by PayScale (2017), which indicates that some colleges are producing negative returns on investment[1] (ROI) on average for their graduates. If entering the workforce without a college degree leads to bleak economic outcomes, graduates from schools with negative ROI are experiencing particularly poor outcomes in the labor market.

The goal of this paper is to identify certain attributes that determine return on investment at these institutions. A major question to address is whether or not returns to schooling are caused more by the ability of the students at a particular institution, or by the quality of the institution itself. Through an analysis of the literature on higher education returns and college attainment rates, I determine that returns on investment are due, at least partially, to institutional characteristics. I estimate an econometric model using OLS to determine the most significant predictors of ROI, and test the hypothesis that displacement from a major city and religious affiliation are critical institutional characteristics that predict return on investment. I find that distance to major city has a significant negative effect on ROI while religious affiliation does not. Several other institutional characteristics are strongly significant, including percentage of STEM graduates, graduation rate, endowment per student, an engineering description,

[1] Will be used interchangeably with ROI going forward

membership in the Ivy League, and a sports school description. I also find that a control for student ability, measured by average SAT scores, is highly significant in predicting an institution's ROI. The implications for this analysis are relevant given the high pressure to attend college to seek the college-wage premium, despite increasingly high costs to attend (Baum, Ma, & Payea 2013). While attending college is certainly beneficial to the majority of prospective students, this analysis shows that particular institutions are likely to lead graduates to low or negative returns on investment. It is important to identify the characteristics of these schools so that policies can be made to help reform them. This is the first paper of my knowledge to discuss negative returns on investment at the institutional level, and should serve the purpose of informing prospective students to make financially sound decisions about attending college.

The remainder of the paper is organized as follows: Section II provides an incentive to study institutional characteristics of colleges by reviewing the academic literature on higher education returns, Section III discusses the data and my methods of analysis, as well as the theoretical rationale behind critical variables, Section IV discusses the results of several regressions estimated using OLS, and Section V draws conclusions and discusses possibilities for future work on institutional characteristics and return on investment.

II. Review of Literature

Academic research has produced a great deal of literature on higher education returns, although most has focused on individuals rather than colleges as the unit of analysis. This paper contributes to prior research conducted on college-level effects, and is novel in that it attempts to determine a set of institutional characteristics that may cause returns on investment to be lower than the current college-wage premium. For an exhaustive review of the literature to date, see

Oreopoulos and Petronijevic (2013), which covers the classic economic theory on why individuals decide to attend college, the rising college-wage premium and an explanation for this phenomenon, differences in returns on investment based on field of study, the debate on whether attending college is an investment in human capital versus a market signal of innate ability, the non-pecuniary benefits of college, the effects of attending college for 'marginal' students who are in between enrolling and not enrolling in school, stagnating college completion rates, and the cost of attending college.

Perhaps the most renowned researchers on the topic of higher education returns are Pascarella and Terenzini, who wrote a seminal book titled *How College Affects Students.* This two volume series is a comprehensive account of the effects of postsecondary education on topics such as job performance, satisfaction with work, and earnings. They find some evidence suggesting college graduates are more satisfied with their work than high school diploma holders, due to the high earnings and social status they receive with their jobs. However, the same individuals report dissatisfaction when it comes to the actual work they are doing. There is also evidence that college graduates outperform high school diploma holders when they are working the same job, but the researchers note this effect may be explained by factors such as an individual's ability or motivation, other than simply holding the bachelor's degree (Pascarella & Terenzini, 2005).

More closely related to this paper, Pascarella and Terenzini (2005) analyze between-college effects on subsequent student earnings, finding that measures of institutional quality have positive impacts on earnings after graduation. They emphasize selectivity measures such as average SAT and ACT scores as the primary indicator of institutional quality, but also include variables for student-to-faculty ratio, academic expenditures per student, tuition, and percentage

of faculty with PhDs as measures of quality. Many of these same variables appear in my analysis, but differ in interpretation. Pascarella and Terenzini define institutional quality as the selectivity of the school, controlling for other characteristics that may impact earnings. I define institutional quality by a broad set of characteristics, and include selectivity measures to control for student-selection bias into different schools. Pascarella and Terenzini find these selectivity measures to be the primary drivers of earnings between different colleges – high quality scores translate to higher earnings for graduates post-schooling – with the institutional characteristics explaining very little. This result is difficult to interpret; however, because average test scores are considered to be institutional quality measures. It can be argued that comparing colleges with different average SAT scores says more about the individuals attending the college than the quality of the school itself. Additionally, Pascarella and Terenzini note that the effect on earnings of attending an elite school is inflated, absent any measure for individual ambition, and that by including a proxy for ambition in the analysis this effect is greatly diminished.

In the next section of this literature review, I discuss an ongoing debate in the higher education literature on college completion rates, which have stagnated in recent years. As noted throughout the literature, the pecuniary benefits of attending college are as large as ever in today's labor market, with the college-wage premium continually rising (Athreya & Eberly, 2016; NBER 2017; Restuccia & Vandenbroucke, 2008). Despite an increase in the financial benefits to graduating college, college attainment, as measured by graduation rates, has recently remained stagnant and declined slightly in some cases (Bound, Lovenheim, & Turner, 2009). A series of papers have emerged attempting to explain this phenomenon even as financial returns to graduating college are higher than ever. Some have taken the position that marginal individuals, who are in between attending and not attending college, are now attending more frequently in

response to the higher earnings premium, and may lack the preparation and skill set to successfully complete a course of study. Castro and Coen-Pirani (2016) estimate that approximately half of the stagnation in college-attainment can be attributed to lower levels of ability observed in the 1972 birth cohort relative to the 1948 cohort. Others argue that certain schools lack the necessary resources to provide their student body with a quality education, and that students at these schools are thus less likely to graduate. While both sides likely have merit, the argument for the U.S. lacking college-prepared youth is incomplete, as it fails to address whether institutions are underperforming in preparing their student body for a successful career.

A popular explanation for stagnating college completion rates is a lack of preparation amongst students entering college. Athreya and Eberly (2016) analyze the role of risk in the decision to enroll in college, and the effect of increases and decreases in the college-wage premium on college attainment. They find that both completion risk and earnings risk post-college lower the incentives to attend college for the marginal student. Students not already enrolling often are less likely to complete college if they do enroll, and less likely to attain a high paying career if they graduate (Athreya & Eberly, 2016). Thus, the marginal student will not choose to enroll in response to an increasing wage premium, as the risk they face lowers the potential benefit of the premium. Additionally, Athreya and Eberly find that large fluctuations in the wage-premium will not affect aggregate college-attainment. Students enrolled in college that are struggling to complete a course of study will not be more likely to graduate as a result of a rising premium. Their model predicts that students enrolling in and completing college will continue to do so, even in the event of a precipitous decline in the college-wage premium. These are the students who benefit from the wage premium, and thus they will continue to attend college if there is any financial incentive present. From these findings, Athreya and Eberly

conclude that the supply of young adults in the U.S. equipped to succeed in college has been exhausted.

Athreya and Eberly (2016) provide evidence that individuals who underperform in school contribute to low returns on investment at lower tier institutions. On average, these institutions are serving a subset of college students who would be classified as marginal – such students face both greater completion and earnings risk, as measured by lower graduation rates and low returns on investment at these schools. However, this paper does not address the possibility that institutions producing negative returns on investment for the median student are failing to serve their student body. Given the extreme case where the entire bottom 50 percent of graduating students at a negative ROI school are unable to absorb and learn from a college education, the institution is still awarding degrees and collecting tuition at the student's expense. More likely, some or many of these same individuals might have earned more had they been admitted or able to attend a better school, learned a trade, or attended a professional school. In a review of how ability affects returns to higher education, Webber (2016) finds that even individuals with low ability manage to earn more with a college degree than a high school diploma. This holds even for individuals selecting traditionally lower paying degrees in the humanities and arts. My analysis attempts to control for student ability, so I can isolate the effects that the quality of students have on subsequent earnings versus the characteristics of the school they attend.

Other researchers have proposed a similar argument to my own, that some colleges lack the resources and funding to properly educate their student body. Bound, Lovenheim, and Turner (2009) find in an analysis of decreasing college completion rates at low to mid tier institutions, that collegiate characteristics outweigh student-ability in predicting low graduation rates. Their work does not discount the affect that declining student ability has had on college completion

rates, as they note about one-third of the drop in completion rates can be explained by lower levels of student-preparation. However, they offer a more complete analysis that takes into account rising student-to-faculty ratios, and lower levels of endowment per-student on the supply side of college education. While studying graduation rates does not directly translate to return on investment, their conclusions on certain colleges underserving their student body are in line with my own.

Critical analysis of the debate on stagnant college attainment provides incentive to study institutional characteristics, as they pertain to return on investment. There is compelling evidence that institutions, as well as individuals, affect college outcomes. Indeed, many students at low and negative ROI schools who overcome completion risk by graduating still lose money on their investment. The next section of this paper attempts to discern critical variables that affect a college's return on investment. Identifying these characteristics may aid prospective students and their families in making pragmatic decisions about attending college.

III. Data and Methodology

My methods of analysis involve expanding upon the 2017 College ROI Report: *Best Value Colleges* data set by PayScale. This is a comprehensive data set that includes 1833 four-year public and private institutions in the U.S. The original data set includes, for each school, outcomes for 20-Year Net ROI, Total 4-Year Cost, Graduation Rate, Typical Years to Graduate, and Average Loan Amount. Most of these institutions produce positive returns on investment, with the top-ranked observation reporting a median return of $1,056,000; however, 119 schools report negative ROI, and another 309 report ROI lower than $100,000 over this 20-year period. I define these schools where the ROI is below $100,000 over 20 years as low ROI institutions,

simply due to the fact that their graduates are, on average, netting only an additional $5,000 per year than high school diploma holders with their bachelor's degree. While these institutions are at least producing positive returns, I believe they are low enough to bring attention to in this analysis.

20-Year Net ROI is defined as the present value of 20-year median earnings for students graduating with a bachelor's degree, less the 24-year median earnings for a high school diploma holder and the Total 4 Year Cost (PayScale, 2017). Total 4-Year Cost is the full cost of tuition, plus room and board, and book and supplies (PayScale, 2017). Graduation Rate is the percentage of full-time and first-time students who receive their bachelor's degree within six years of beginning school; while Typical Years to Graduate is the number of years it takes for at least 65 percent of the student body to complete their degree (PayScale, 2017). Average Loan Amount measures the average loan, including all Title IV loans and any institutionally or privately sponsored student loans, multiplied by four years (PayScale, 2017).

The following variables were added to the data: Distance to Major City, Percent STEM, Student-to-Faculty Ratio, Undergraduate Enrollment, Endowment per Student, and Average SAT. Distance to Major City is the driving distance, in miles, to the nearest top 50 U.S. metropolitan population city. Percent STEM is the percent of students who have graduated with degrees in science, technology, engineering, and mathematics. Student-to-Faculty Ratio is the number of enrolled students per full-time faculty member. Endowment per Student is simply the total endowment divided by undergraduate enrollment. Average SAT is the college-wide average for the standardized test, which used by most colleges in admissions decisions (Morse, 2008). This variable is included to control for selection bias, and serves as a proxy for student ability. Additionally, a set of dummy variables were generated for Public, Research, Engineering, Ivy

League, For Sports Fans, Party School, and Religious Affiliation. The dummies were pulled from categorical descriptions in another data set, *Best Universities and Colleges by Salary Potential* (PayScale, 2017). PayScale did not offer any further explanation for these variables, other than their labels. Thus, the exact criterion used to group schools into their respective categories is unknown.

My main regression model features 20-Year Net ROI as the dependent variable and includes all of the above as independent variables, with the exception of Total 4-Year Cost, Typical Years to Graduate, and Average Loan Amount. Total 4-Year Cost is included in the 20-Year Net ROI calculation, and thus should not be in the regression as an additional variable. Average Loan Amount is left out of the regression, as the percentage of students receiving loans is unknown. PayScale's 20-Year Net ROI is not adjusted to account for any need-based financial aid. Using the Average Need-Based Grant and Percent Granted from US News, I calculate a weighted average to create Adjusted ROI. While PayScale offers a separate ROI measure that accounts for financial aid, it is unclear how they calculated it. For that reason, I construct my own variable for Adjusted ROI by computing the weighted average[2]. Additionally, the original data included two observations for public schools – one for in-state students[3] and one for out-of-state. To avoid double counting of these schools, which otherwise share exactly the same set of characteristics, the two observations for ROI were averaged to create a single observation. In order to conserve on data collection effort, I formed a representative sample of the 1833 institutions in the original set. Originally, this included the top 20 percent, middle 20 percent, and bottom 20 percent in ROI ranking. Due to missing observations for some schools, the final

[2] Adjusted ROI = 20-Year Net ROI + (Percent Granted • Average Need-Based Grant)
[3] In-state tuition is often substantially lower than out-of-state tuition, resulting in higher ROI for in-state

sample was 545 colleges. Appendix A provides an alphabetical list of the sampled colleges, and values for 20-Year ROI and Adjusted 20-Year ROI.

Regression Model 1 is stated below.

$$Y_i = \beta_0 + \beta_1 DISTCITY_i + \beta_2 RELIGIOUS_i + \beta_3 STEM_i + \beta_4 GRADRATE_i + \beta_5 STUDFAC_i + \beta_6 STUDFACSQUARED_i + \beta_7 ENROLL_i + \beta_8 ENDOWPERSTUD_i + \beta_9 AVGSAT_i + \beta_{10} PUBLIC_i + \beta_{11} ENGINEERING_i + \beta_{12} RESEARCH_i + \beta_{13} IVY_i + \beta_{14} SPORTS_i + \beta_{15} PARTY_i + \varepsilon_i$$

As stated above, Distance to Major City is defined as driving distance, in miles, to the nearest top 50 metropolitan population U.S. cities, and was obtained from Google Maps. Schools located in closer proximity to major cities may have enhanced access to high paying jobs in these cities when compared to similar institutions located in more rural settings. Indeed, many high ROI schools are situated in or around major cities, while the majority of low and negative ROI schools are further displaced. The top 50 metropolitan cities were obtained from a U.S. Census Bureau report on the 2010 Census results, and are reported in Table 3. Not surprisingly, densely populated cities such as New York, NY and Los Angeles, CA top the list, with metropolitan areas surrounding Birmingham, AL and Buffalo, NY rounding out the bottom.

[Insert Table 3 about here]

Religious Affiliation is included because, of the 119 schools with negative returns on investment in the original data set, many had religious affiliation, while very few of the higher ROI schools were religiously affiliated. However, the majority of schools that dropped out due to incomplete data were religious schools at the bottom of the ROI distribution. Of the original 119

schools with negative ROI, only 39 had data complete enough to be featured in the final data set. Of these 39 schools, 19 were religiously affiliated. Schools that emphasize religious teachings are less likely to produce graduates in high paying STEM degrees, as is evident in the data. Of 173 schools that are considered to be religiously affiliated, the average percentage of students with STEM degrees was 11.77%, compared to 17.99% for the total data set.

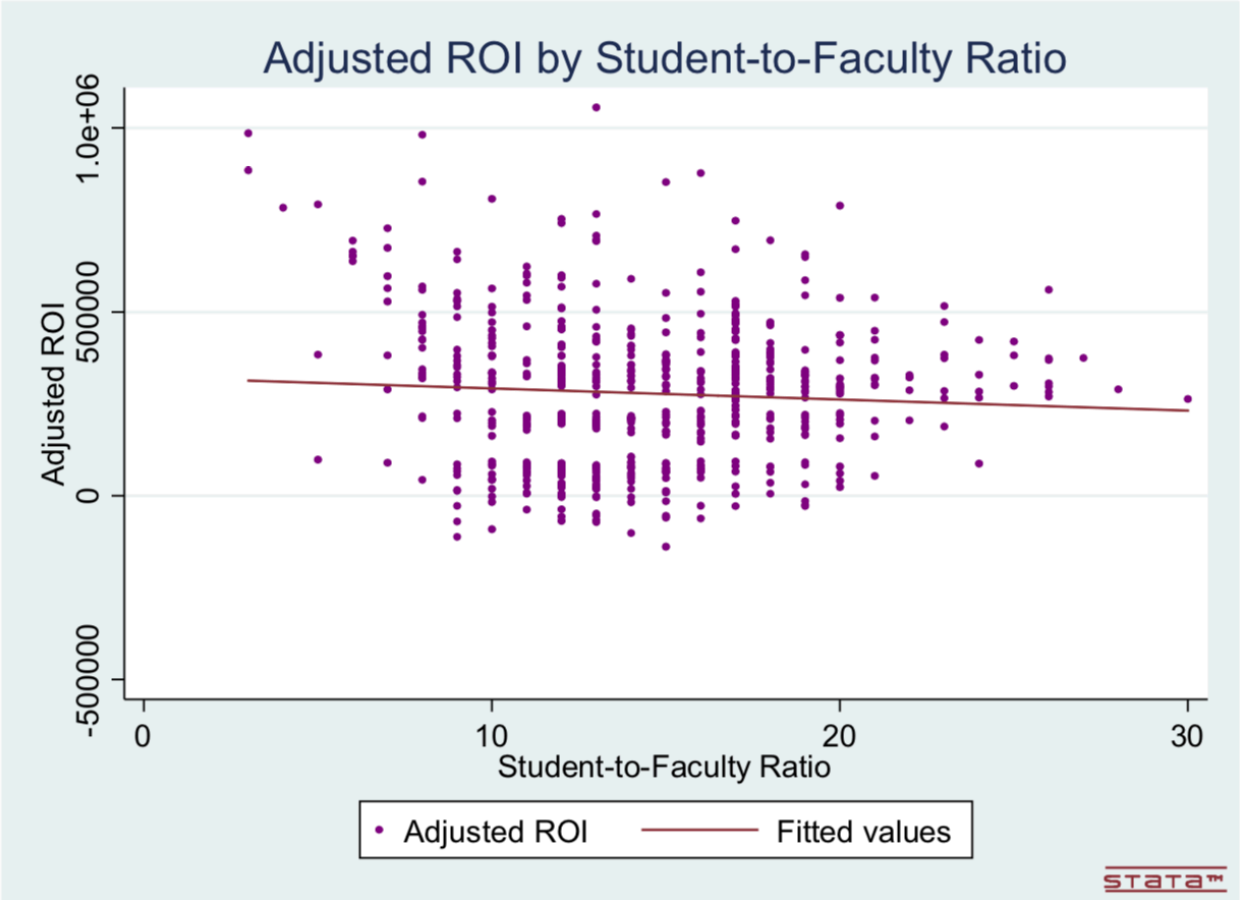
As stated earlier, Percent STEM is the percentage of students who have graduated with a degree in science, technology, engineering, or mathematics, and was obtained from *Best Universities and Colleges by Salary Potential* (PayScale, 2017). There is a vast amount of literature supporting the claim that STEM degrees lead to the highest paying careers compared to other degrees at the individual level (Oreopoulos & Petronijevic, 2013; Pascarella & Terenzini, 2005; Webber, 2016). This fact leads to the hypothesis that institutions with higher proportions of the student body graduating with degrees in STEM will produce higher returns than schools with limited STEM programs.

Graduation Rate is included as a potential measure of both student and institutional quality. Schools with higher graduation rates may have a student body comprised of individuals with higher ability than schools with lower graduation rates. However, higher graduation rates may also be the result of specific schools educating their student body more effectively than others. In any case, graduation rate is expected to have a positive effect on ROI.

Student-to-Faculty Ratio is the number of enrolled students divided by the number of full-time faculty members. Typically, schools with large amounts of resources and small to moderate enrollments have lower student-to-faculty ratios. A low student-to-faculty ratio often leads to smaller classes and more interaction with the professor. Prior research has recognized low student-to-faculty ratios as markers of strong institutions (Pascarella & Terenzini, 2005), and

highly significant in explaining graduation rates (Bound et al., 2009). However, a preliminary regression indicated a positive relationship between Student-to-Faculty Ratio and Adjusted ROI that did not match the slight negative linear relationship evident in Figure 1 below.

Figure 1



If this positive relationship holds, there are several possible explanations for this result. One is that larger public schools, which may have the highest student-to-faculty ratios in the data set due to higher enrollments, tend to employ the most distinguished scholars and outperform smaller public schools in return on investment. Additionally, larger ratios may lead to an increased level of efficiency in schools where professors do not have time to offer extended

office hours and to repeat material. This efficient style of delivery may lead to more complete understanding of the material and a higher quality education. I include a squared Student-to-Faculty ratio in the model to account for the possibility that Adjusted ROI might be explained by higher powers of Student-to-Faculty Ratio.

Enrollment and Endowment were obtained from US News. Enrollment ranges from low to high in both elite and low quality schools, so there is no expected effect on ROI. Endowment per Student is a measure of institutional resources, and specifically, the amount of resources that are allocated to each student. Increasing Endowment per Student is expected to have a positive effect on ROI.

Including Average SAT is the main way I attempt to account for selection bias. While college level characteristics should be significant in explaining an institution's ROI, there is a clear selection effect where high ability individuals, who possess higher earning potential due to individual characteristics, attend more elite schools that often rank high in ROI. Using Average SAT as a proxy for student ability, I am able to control, at least partially, for this selection bias. Average SAT was obtained from Prep Scholar. It is expected that schools exhibiting higher Average SATs will produce greater returns on investment; however, controlling for this should allow me to more clearly see the causal impacts of other institutional characteristics on ROI.

The remaining variables are all dummies that measure various institutional characteristics. The model controls for public institutions[4], but prior research does not indicate that public or private schools would outperform the other in terms of return on investment (Pascarella & Ternezini, 2005). Engineering[5], Research Institution[6], and Ivy League are all expected to be positively correlated with ROI. Engineering is expected to be significant due to

[4] 263 institutions are considered Public
[5] 25 institutions are considered Engineering
[6] 206 institutions are considered Research Institutions

the documented wage-premium for graduates with these degrees. Ivy may have too few observations to be significant, as there are only eight schools in this conference. However, these schools are all considered elite and report high returns. For Sports Fans[7] and Party School[8] are included to control for cultural characteristics of the schools. It is possible that campuses with strong athletic and social cultures are better connected to high paying jobs in fields such as the financial services, but alternatively this could reflect weaker academic cultures and hence lower returns.

In addition to Model 1, I estimate an additional series of regressions that include the same variables as Model 1, but differing subsets of the original 545 institutions. Models 2 and 3 are estimated to isolate the effects of institutional characteristics on public versus private institutions. Model 2 features only public institutions, and has a total sample size of 238 institutions. Model 3 features only private institutions, and has a total sample size of 306 institutions. Models 4-6 are identical to Models 1-3, respectively, but use the non-adjusted 20-Year ROI as the dependent variable. These models are estimated to observe the effects of institutional characteristics on ROI for prospective students who plan on paying full-tuition.

IV. Results

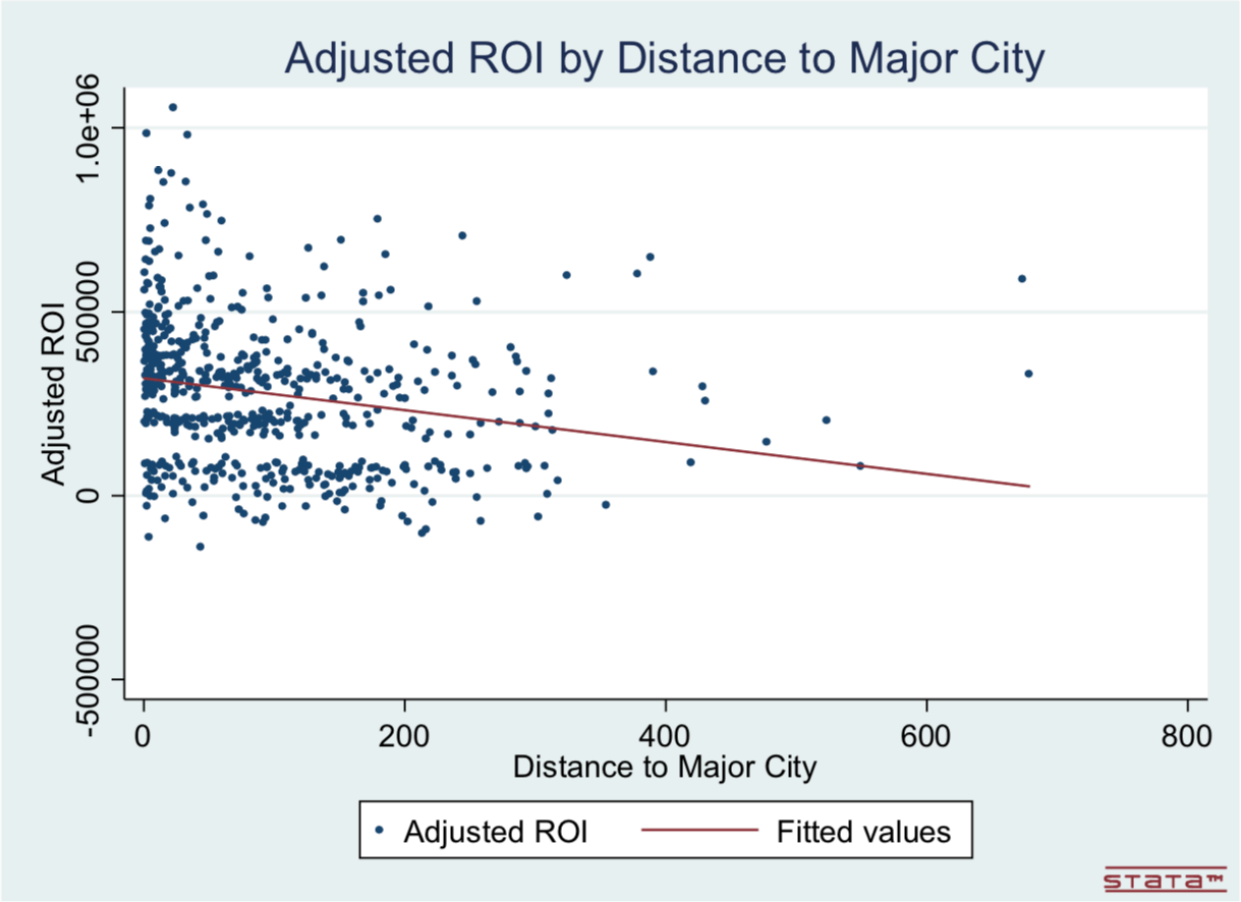
The OLS results from Models 1-3 are reported in Table 1. In Model 1, the results indicate that after controlling for student ability via Average SAT, the variables Distance to Major City, Percent STEM, Graduation Rate, Endowment per Student, Engineering, Ivy, and For Sports Fans are all statistically significant in predicting a college's median return on investment.

[Insert Table 1 about here]

[7] 223 institutions are considered For Sports Fans
[8] 19 institutions are considered Party Schools

Distance to Major City has a negative effect on ROI as predicted. The magnitude of this effect is moderate - for every 100 miles further displaced from a major city, Adjusted ROI is expected to decrease by $31,504.40. Thus, moving slightly further from a city does not lead to a precipitous decline in expected ROI, but schools in rural settings are expected to produce low returns. The coefficient is extremely significant as indicated by the p-value of 0.000. Figure 2 below indicates a linear relationship between Distance to Major City and Adjusted ROI. This is the first paper, to my knowledge, to find this result.

Figure 2



Percent STEM is also highly significant, with a p-value of 0.000, and has a positive effect on ROI. For a 10-percentage point increase in the percentage of undergraduates pursuing degrees in science, technology, engineering, and mathematics, Adjusted ROI is expected to increase by $37,678.39. The strong magnitude of this effect supports the literature on returns to higher education by major, which suggests STEM degrees translate to the highest paying jobs out of college (Oreopoulos & Petronijevic, 2013; Webber, 2016).

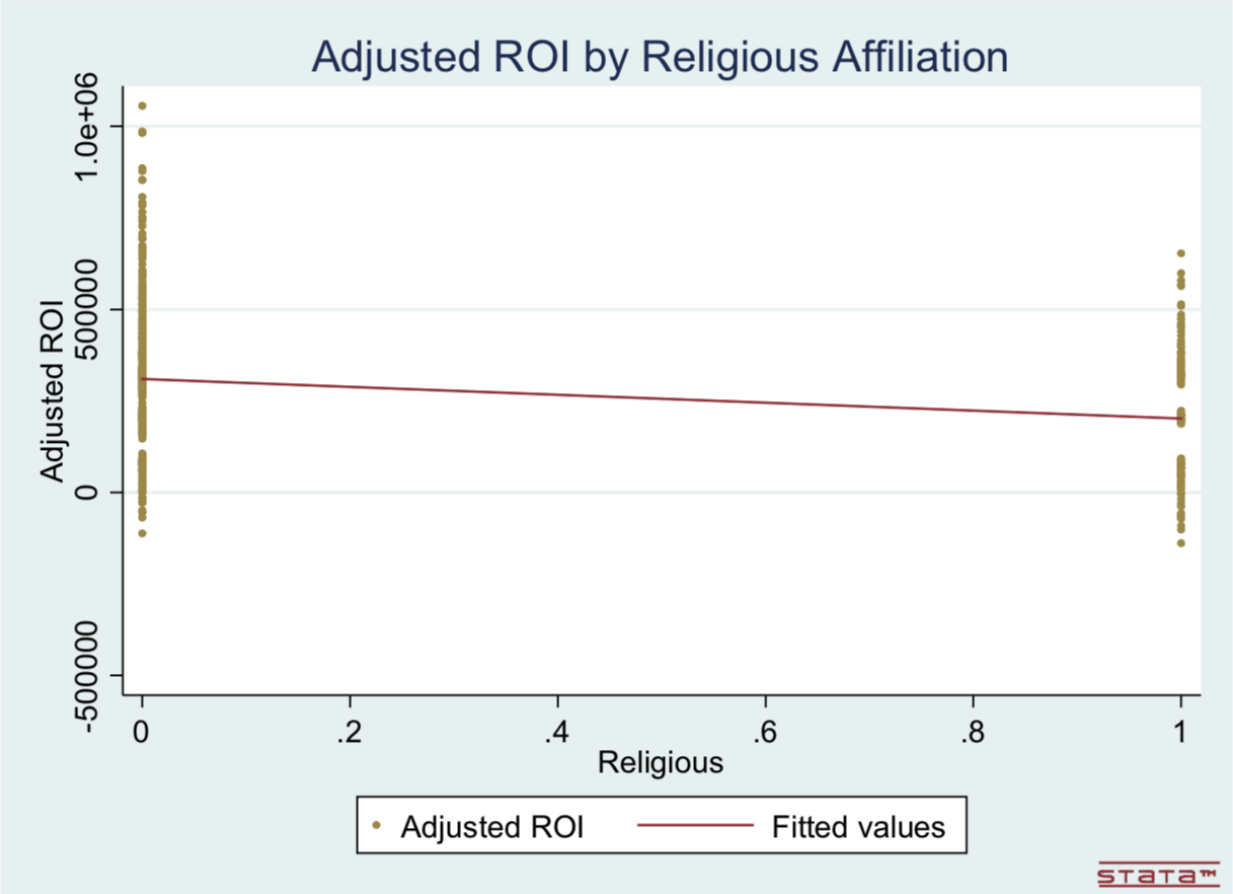
Graduation rate has a positive effect on ROI, and is also highly significant with a p-value of 0.001. For a 10-percentage point increase in the graduation rate, Adjusted ROI is expected to increase by $19,585.61. The interpretation of graduation rate is somewhat unclear. It is clearly a measure of college-wide attainment at each particular institution, but whether a college's graduation rate is more due to the ability of the student body versus the school's ability to offer a quality education is unknown. Some evidence for graduation rate representing student ability is evident in its strong correlation of 0.82 with Average SAT. However, both variables are highly significant, and thus are left in the regression.

Throughout the literature on higher education returns, high levels of resources allocated to each student at a college has been marked as an indicator of good quality (Bound et al., 2009). Indeed, Endowment per Student has a positive effect on ROI, with a p-value of 0.004. For an additional $100,000 increase in endowment per student, Adjusted ROI is expected to increase by $3,600.05.

Average SAT, as mentioned above, is my way of accounting for the ability portion of student-selection bias. As expected, average SAT has a positive effect on a college's ROI. As an institution's average SAT increases by 100 points, Adjusted ROI is expected to increase by $24,163.47. Average SAT is highly significant with a p-value of 0.001.

Three of the six institutional characteristic dummy variables turned out to be significant in explaining ROI. While Religious Affiliation was hypothesized to be a significant predictor of low and negative returns, this hypothesis did not hold. While many of the low and negative ROI schools are religiously affiliated as indicated by Figure 3 below, controlling for other variables indicates that this is not a causal relationship. However, Engineering, Ivy League, and For Sports Fans all turned out to have significant coefficients.

Figure 3



Although the correlation between Engineering and STEM is large at 0.73, both variables are statistically significant and thus were left in the model. Compared with schools that are not considered to be Engineering, Engineering schools are expected to have an Adjusted ROI that is

$192,416.70 higher. This large effect, along with that of Percent STEM, illustrates the pecuniary importance of degree selection that is found throughout the literature (Altonji et al., 2014; Oreopoulos & Petronijevic, 2013; Webber, 2016).

Ivy League schools are considered to be among the most elite institutions in the country, so not surprisingly, there is a significant positive effect on ROI for attending an Ivy League school while holding the other variables constant. Adjusted ROI is expected to increase by $86,714.02 for attending an Ivy League school, compared to schools not in this conference. These schools mostly exhibit the other characteristics of high ROI schools – a relatively high percentage of STEM graduates, large endowments with modest enrollments, and very high averages for standardized tests such as the SAT – but the distinction of being in the Ivy League alone is a significant predictor of high returns. This suggests there are unobservable characteristics of these schools that contribute to high earnings for their graduates. The most compelling argument for this is the market signaling power an Ivy League degree holds. A recent study on the power of market signaling showed that in an initial assessment to determine starting salary, employers are able to distinguish a college graduate's ability on the first day of the job based on the school they attended, the major they selected, and the grades they received (Arcidiacono, Bayer, & Hizmo, 2010).

For Sports Fans was another surprising variable that turned out to be a predictor of higher returns on investment. There are several possible explanations for this result: the strong athletic culture in high paying jobs in the financial services, the social networking opportunities that arise from collegiate athletic participation, as well as the distinction playing a college sport provides on one's resume or in a job interview. Schools that are considered For Sports Fans are expected

to have an Adjusted ROI that is $52,790.29 greater than schools not in this category. This is a highly significant result, with a p-value of 0.000.

I conduct two classic tests on Model 1, the Ramsey Reset test and White's test for heteroskedasticity. The Ramsey test gives an F-score of 1.16 with a p-value of 0.3239, as I fail to reject the null hypothesis that higher powers of the explanatory variables have an effect on Adjusted ROI. White's test for heteroskedasticity gives a chi-squared score of 217.42 with a p-value of 0.000, indicating significant heteroskedasticity in the model. Thus, robust standard errors are reported in all specifications.

The findings remain relatively consistent in Models 2 and 3. In Model 2, private schools are dropped from the sample to isolate the effects of institutional characteristics on public schools. Distance to Major City, Percent STEM, and Graduation Rate all remain highly significant with p-values of 0.006, 0.000, and 0.005, respectively. For public universities, moving 100 miles further away from a major metropolitan area is expected to decrease ROI by $20,406.70 – the magnitude of the effect on public schools is mitigated by about $11,000, but Distance to Major City remains a critical variable in predicting ROI. For an additional 10-percentage point increase in the percentage of STEM graduates at a public university, ROI is expected to increase by $58,135.44. This strength of this effect is heightened at public institutions, which tend to place a greater emphasis on producing STEM degrees, versus elite private institutions omitted from the sample that are geared more towards a liberal arts education. Additionally, Average SAT remained weakly significant, as the p-value increased to 0.070 in Model 2. The magnitude of this effect on student ability is also dampened at public institutions – for an additional 100 point increase on a public university's average SAT score, ROI is expected to increase by $18,846.33. Of the top-ranked ROI schools, about half are public and half are

private, whereas most of the schools at the bottom of the ROI distribution are private. This result makes sense given the assumption that there is less variation in the ability of students at public institutions from top to bottom.

Endowment per Student, Engineering, and For Sports Fans are all insignificant in the public only regression. For Endowment per Student, it is likely that higher enrollments at public schools lower the ratio of endowment allocated to each student, even at high quality institutions with very large endowments. Compared to private schools with large endowments where undergraduate enrollment is much smaller, the ratio will be less. Engineering may be insignificant due to a low number of public schools that fit the criteria for Engineering[9], as there are only 11 public engineering schools in the data set. However, these 11 institutions mostly appear near the top of the ROI distribution. It is more likely that the sample size of 239 public institutions and multicollinearity are causing this insignificant result, as there is a large correlation between Percent STEM and Engineering. Similarly, the coefficient on For Sports Fans is insignificant in Model 2. For Sports Fans is correlated with Research (0.61) and Enrollment (0.59), both of which are public school properties. It is expected that the coefficient became insignificant due to a lower sample size coupled with these correlations. Ivy League drops out of Model 2 as these are all private institutions.

Model 3 contains estimates for only private institutions. Distance to Major City, Percent STEM, Graduation Rate, Endowment per Student, Average SAT, Engineering, and For Sports Fans all remain highly significant, with p-values of 0.000, 0.002, 0.049, 0.001, 0.016, 0.000, and 0.005, respectively. The magnitude of the effect of Distance to Major City increases substantially in private institutions. For private institutions, moving 100 miles further away from a major city is expected to decrease ROI by $43,038.63. This result further indicates the importance of

[9] Ibid. 3

location in predicting returns on investment. At private schools, where there is a greater gap between the top and bottom of the ROI distribution, schools in rural settings are more likely to exhibit lower ROI. The coefficient on Percent STEM is lower in magnitude – as the percentage of graduates with STEM degrees increases by 10-percentage points, ROI is expected to increase by $28,719.64. This decrease in magnitude is likely due to the emphasis placed on liberal arts education by many private institutions. Endowment per Student is again significant in the sample of private institutions. For an additional $100,000 increase in Endowment per Student, ROI is expected to increase by $3,844.61. This result is consistent with the notion that private institutions with large endowments typically enroll fewer students than public institutions with similar endowments. Average SAT is significant at the 5% level. A 100-point increase in the average SAT for a private institution is expected to increase ROI by $23,458.89. This result confirms the importance of student ability in predicting an institution's ROI. The effect of average SAT scores on ROI is larger at private schools, where the ROI and ability distributions are more widespread.

The results from Models 4-6 are nearly identical to Models 1-3, and are reported in Table 2. Using the unadjusted 20-Year ROI as the dependent variable led to a significant effect for Public in Model 4, which was not observed in Model 1. Public schools are expected to have unadjusted returns on investment that are $40,780.18 greater than private schools, holding the other institutional characteristics constant. The coefficient for Public has a p-value of 0.052, barely missing the 5% significance threshold. This effect is easily understood, insofar as public schools are typically cheaper to attend than private schools for those paying full tuition. However, the average need-based grant throughout the entire data set is only $15,937.98 – much lower than the expected effect of Public on 20-Year ROI. This suggests there are factors other

than the financial aid adjustment contributing to this effect. As noted earlier in this paper, public schools tend to hire the most distinguished scholars in their respective fields. It is possible that taking classes from leading experts in a field results in a higher quality education and high returns.

[Insert Table 2 about here]

V. Conclusions

With the majority of prior research on higher education return on investment having focused on individual ability and preferences to predict ROI, I conclude that institutional characteristics also play a critical role in predicting ROI. Not surprisingly, my analysis finds an increased premium at schools that produce a high percentage of graduates in the science, technology, mathematics, and engineering fields of study. My analysis also finds novel results – a negative effect on ROI for schools in more rural locations, and a positive effect on ROI for attending a school with a strong athletic culture. Additionally, my analysis shows that there is little appreciable effect on ROI for attending an elite private school versus an elite public school, as indicated by insignificant coefficients on Student-to-Faculty ratio and Enrollment. However, Ivy League schools, which share virtually the same characteristics with other elite private schools, have a positive effect on ROI seemingly on the account of membership in this prestigious conference.

What remains alarming is the number of institutions that exhibit negative returns on investment for at least the majority of their students. It is important to distinguish that returns are estimated for graduates of these institutions and do not include those who begin and fail to complete a course of study. If a substantial amount of U.S. colleges and universities are

providing graduates with an investment loss, it begs the question of why students attend these institutions in the first place. Indeed, my analysis points out common characteristics of these schools, but the ROI information is already available should a prospective student search for it. Many students entering college are surely unaware of the median returns on investment they should expect for attending their particular school. Still, others are aware and will attend low and negative ROI producing institutions. There are several possible explanations for why a student would attend such an institution. First, for even the lowest ranking schools in the ROI distribution, there are likely graduates who make a great deal more money than they would have without attending college. Any prospective student could identify the potential benefits of the college-wage premium, weighing them against the risk of attending a school that produces low or negative returns at the median, and gamble that they will beat the average for that school. There is reason to suspect that more students entering college gamble on their ability than should, as evident by the concept of overconfidence bias. A study of failing business entries in the late twentieth century found a significant relationship between excessive business entry (and ultimate failure) and overconfidence (Camerer & Lovallo, 1999). A similar relationship may be at play with college entry for the individual, where more students gamble on low and negative return institutions than should, thinking they will be near the top of their class. In addition to overconfidence, recent studies have highlighted several non-pecuniary benefits from attending college. Supplementing the college-wage premium, higher education may influence individuals to make better life choices pertaining to healthcare, marriage, and parenting style (Oreopoulos & Salvanes, 2011). While the bulk of this research on non-pecuniary benefits in conjunction with positive return on investment for attending college, it is possible that individuals would be willing to sustain a financial loss if it meant getting married and living a more fulfilling life.

There are several limitations to this study. Collecting my own data in a relatively short period of time required sampling a subset of the original 1833 schools in the PayScale data. With more time, I would have collected data for the entire distribution of schools, and over the course of several years, instead of using one cross-section. It is important to note that the 2017 ROI figures calculated by PayScale are somewhat ambiguous, as they do not disclose their precise methodology. It is assumed that 20-Year ROI is the net present value of investing in an education at that particular institution, in 2017 dollars, calculated for graduates from the class of 1997. If this is the case, there is some degree of matching error in the data, as the measures of institutional characteristics I added to the data are current. Some of these characteristics, such as location and public, are fixed and do not change over time. However, characteristics such as enrollment, endowment, and student-to-faculty ratio are subject to marginal fluctuations over time. I make the assumption that these characteristics have remained fairly constant over time, as institutional change tends to be slow moving. Furthermore, it is unlikely that a significant number of institutions in the sample have changed drastically in the last 20 years, so as to significantly alter my findings.

This paper does find substantial evidence that institutional characteristics impact college return on investment, and has brought attention to a set of critical variables where some institutions are excelling and others are lacking. As noted above, schools cannot improve upon fixed characteristics, but hopefully this analysis provides insight into characteristics that can be improved for certain institutions. Indeed, there are examples of schools in this analysis that are not traditionally thought of as prestigious, nor particularly selective, but rank very well in terms of ROI. While certain predictors of large institutional returns on investment are fairly clear, such as high percentages of STEM graduates, more research is needed to confirm the effects of

Distance to Major City and For Sports Fans on ROI found in this paper. Specifically, further research examining the causal relationship between certain institutional variables and negative returns would prove useful in reforming these institutions.

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Table 1: Median Earnings Estimates (Dependent Variable = Adjusted 20-Year ROI)

	Model 1		Model 2		Model 3	
Variables	Coeff	RSE	Coeff	RSE	Coeff	RSE
Distance to Major City	-315.04	65.114***	-202.067	73.832***	-430.386	109.392***
Religious	-3821.681	17545.42	0	omitted	3349.048	18439
Percent STEM	3767.839	721.563***	5769.589	1156.421***	2871.964	899.65***
Graduation Rate	195856.1	58293.62***	185174	67167.44***	182766.3	92589.54**
Student-to-Faculty Ratio	-6749.025	7412.82	-13905.73	13378.66	-17361.5	12700.73
Student-to-Faculty Ratio^2	330.993	207.616	520.475	344.509	691.372	487.039
Enrollment	-0.776	0.922	-0.351	0.949	10.487	3.662***
Endowment per Student	0.036	0.012***	0.143	0.196	0.038	0.011***
Average SAT	241.635	74.536***	184.135	103.512*	234.589	96.996**
Public	33205.77	20891.620	0	omitted	0	omitted
Engineering	192416.7	51844.03***	82520.96	96526.45	239499.9	53476.54***
Research	23483.19	15359.42	15316.51	22031.84	-3502.024	24832.06
Ivy League	86714.02	31755.54***	0	omitted	56747.11	33438.94*
For Sports Fans	52790.29	13858.31***	13908.25	21359.92	54712.37	19347.9***
Party School	-4577.22	19512.76	-6715.542	20905.65	15081.33	49395.77
Constant	-189981.9	101668.6*	-48887.33	156140.6	-113994	132234.4
Observations	545		239		306	
R Squared	0.6512		0.6596		0.6751	
Public included?	YES		YES		NO	
Private included?	YES		NO		YES	

Estimate significant at the ***1%, **5%, *10% level
RSE = Robust Standard Error

Table 2: Median Earnings Estimates (Dependent Variable = 20-Year ROI)

	Model 4		Model 5		Model 6	
Variables	Coeff	RSE	Coeff	RSE	Coeff	RSE
Distance to Major City	-314.470	65.362***	-197.383	73.792***	-432.915	110.058***
Religious	-2648.591	17619.95	0	omitted	4961.015	18483.01
Percent STEM	3728.994	726.466***	5728.9	1161.414***	2858.733	908.046***
Graduation Rate	186234	58556.8***	181760.4	67176.52***	166883.9	92883.78*
Student-to-Faculty Ratio	-5718.97	7421.131	-13186.16	13293.24	-17201.58	12745.44
Student-to-Faculty Ratio^2	303.803	207.392	499.884	341.962	700.880	488.649
Enrollment	-0.769	0.924	-0.329	0.951	10.651	3.652***
Endowment per Student	0.034	0.012***	0.137	0.196	0.037	0.011***
Average SAT	247.320	74.735***	189.598	103.220*	242.299	97.101**
Public	40780.18	20965.44*	0	omitted	0	omitted
Engineering	195448.3	52402.78***	84670.54	97237.12	240896	54078.74***
Research	23956.38	15418.33	14310.41	22099.12	-2089.188	24879.06
Ivy League	84651.56	31669.78***	0	omitted	53508.93	33049.85
For Sports Fans	54056.77	13877.05***	14881.52	21466.21	56252.86	19314.97***
Party School	-4245.156	19579.67	-7498.171	21466.21	17293.37	49967.71
Constant	-213256	101902.2**	-64028.28	155461.9	-131937.8	132539.1
Observations	545		239		306	
R Squared	0.6473		0.6578		0.6659	
Public included?	YES		YES		NO	
Private included?	YES		NO		YES	

Estimate significant at the ***1%, **5%, *10% level
RSE = Robust Standard Error

Table 3: US Top 50 Cities by Metropolitan Population

1	New York-Newark-Jersey City, NY-NJ-PA Metropolitan Statistical Area
2	Los Angeles-Long Beach-Anaheim, CA Metropolitan Statistical Area
3	Chicago-Naperville-Elgin, IL-IN-WI Metropolitan Statistical Area
4	Dallas-Fort Worth-Arlington, TX Metropolitan Statistical Area
5	Houston-The Woodlands-Sugar Land, TX Metropolitan Statistical Area
6	Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Statistical Area
7	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD Metropolitan Statistical Area
8	Miami-Fort Lauderdale-West Palm Beach, FL Metropolitan Statistical Area
9	Atlanta-Sandy Springs-Roswell, GA Metropolitan Statistical Area
10	Boston-Cambridge-Newton, MA-NH Metropolitan Statistical Area
11	San Francisco-Oakland-Hayward, CA Metropolitan Statistical Area
12	Phoenix-Mesa-Scottsdale, AZ Metropolitan Statistical Area
13	Riverside-San Bernardino-Ontario, CA Metropolitan Statistical Area
14	Detroit-Warren-Dearborn, MI Metropolitan Statistical Area
15	Seattle-Tacoma-Bellevue, WA Metropolitan Statistical Area
16	Minneapolis-St. Paul-Bloomington, MN-WI Metropolitan Statistical Area
17	San Diego-Carlsbad, CA Metropolitan Statistical Area
18	Tampa-St. Petersburg-Clearwater, FL Metropolitan Statistical Area
19	Denver-Aurora-Lakewood, CO Metropolitan Statistical Area
20	St. Louis, MO-IL Metropolitan Statistical Area
21	Baltimore-Columbia-Towson, MD Metropolitan Statistical Area
22	Charlotte-Concord-Gastonia, NC-SC Metropolitan Statistical Area
23	Orlando-Kissimmee-Sanford, FL Metropolitan Statistical Area
24	San Antonio-New Braunfels, TX Metropolitan Statistical Area
25	Portland-Vancouver-Hillsboro, OR-WA Metropolitan Statistical Area
26	Pittsburgh, PA Metropolitan Statistical Area
27	Sacramento–Roseville–Arden-Arcade, CA Metropolitan Statistical Area
28	Cincinnati, OH-KY-IN Metropolitan Statistical Area
29	Las Vegas-Henderson-Paradise, NV Metropolitan Statistical Area
30	Kansas City, MO-KS Metropolitan Statistical Area
31	Austin-Round Rock, TX Metropolitan Statistical Area
32	Cleveland-Elyria, OH Metropolitan Statistical Area
33	Columbus, OH Metropolitan Statistical Area
34	Indianapolis-Carmel-Anderson, IN Metropolitan Statistical Area
35	San Jose-Sunnyvale-Santa Clara, CA Metropolitan Statistical Area
36	Nashville-Davidson–Murfreesboro–Franklin, TN Metropolitan Statistical Area
37	Virginia Beach-Norfolk-Newport News, VA-NC Metropolitan Statistical Area
38	Providence-Warwick, RI-MA Metropolitan Statistical Area
39	Milwaukee-Waukesha-West Allis, WI Metropolitan Statistical Area
40	Jacksonville, FL Metropolitan Statistical Area
41	Oklahoma City, OK Metropolitan Statistical Area
42	Memphis, TN-MS-AR Metropolitan Statistical Area
43	Raleigh, NC Metropolitan Statistical Area
44	Louisville/Jefferson County, KY-IN Metropolitan Statistical Area
45	Richmond, VA Metropolitan Statistical Area
46	New Orleans-Metairie, LA Metropolitan Statistical Area
47	Hartford-West Hartford-East Hartford, CT Metropolitan Statistical Area
48	Salt Lake City, UT Metropolitan Statistical Area
49	Birmingham-Hoover, AL Metropolitan Statistical Area
50	Buffalo-Cheektowaga-Niagara Falls, NY Metropolitan Statistical Area

Retrieved from: https://www.currentresults.com/Weather-Extremes/US/largest-cities-list.php

Appendix A: Alphabetical List of Colleges and 20-Year ROI, Adjusted 20-Year ROI

College	20-Year Net ROI	Adjusted ROI
Adelphi University	292000	302781.40
Adrian College	-56200	-36997.65
Agnes Scott College	-23100	-1779.86
Alabama State University	20950	25348.04
Albany State University	-16700	-14532.87
Albertus Magnus College	345000	355963.92
Albion College	184000	207328.00
Alcorn State University	3500	4975.50
Alderson-Broaddus College	312000	329030.16
Alfred University	207000	223587.18
American University - Washington D.C.	368000	381262.72
Amherst College	396000	423709.00
Anderson University - Anderson, SC	-39300	-28368.84
Aquinas College - Grand Rapids, MI	-53200	-38019.76
Arizona State University (ASU)	368000	373844.42
Arkansas Tech University	181500	184531.44
Armstrong Atlantic State University	161500	164682.07
Ashland University	41400	48729.04
Auburn University	333500	336314.12
Austin Peay State University	149000	154984.00
Babson College	726000	741702.96
Bates College	318000	335835.54
Bay Path College	57500	76582.70
Belmont Abbey College	190000	196116.48
Beloit College	7100	26083.79
Bennington College	-7400	15572.60
Bentley University	579000	592742.96
Berklee College of Music	18900	18900.00
Berry College	45000	60809.50
Bethany College - Bethany, WV	59200	76879.20
Bethel University - Saint Paul, MN	203000	218133.68
Bethune Cookman University	63000	72482.90
Blackburn College	-18100	-4315.84
Bloomfield College	177000	192533.79
Bloomsburg University of Pennsylvania	215500	219291.36
Bluffton University	37600	55524.12
Boise State University (BSU)	255500	258531.08
Boston College	494000	509157.60
Boston University	394000	406067.56
Bowdoin College	336000	354992.70
Bowling Green State University - Bowling Green, OH	204000	208428.80
Bradley University	328000	338911.36
Brandeis University	362000	381581.00
Bridgewater College	61200	82386.36
Bridgewater State College	207500	211472.50
Brown University	578000	597406.20

Bucknell University	541000	551693.00
California College of the Arts	321000	333992.00
California Institute of Technology	864000	885369.51
California Lutheran University (CLU)	293000	311333.00
California Polytechnic State University	655500	656874.36
California State Polytechnic University - Pomona	510500	516035.38
California State University - Chico	416500	423458.70
California State University - Fresno (Fresno State)	360500	367783.94
California State University - Long Beach (CSULB)	368500	373322.58
California State University - Los Angeles (CSULA)	291500	298631.98
California State University - Sacramento (CSUS)	375500	381682.37
California State University - San Bernardino (CSUSB)	281500	289554.64
California State University - San Marcos (CSUSM)	291500	297444.91
California State University - Stanislaus	320500	328075.31
Campbellsville University	-81400	-66516.53
Cardinal Stritch University	312000	323294.80
Carnegie Mellon University	678000	692545.44
Carroll University - Waukesha, WI	61700	75756.38
Carson Newman College	31200	31200.00
Case Western Reserve University	531000	544796.44
Catholic University of America	368000	381719.20
Cazenovia College	-94900	-68750.50
Central Connecticut State University	341500	345455.77
Central Washington University (CWU)	306000	311658.24
Chatham University	35700	42761.02
Chestnut Hill College	76000	93181.94
Christopher Newport University	217500	220442.49
Claremont McKenna College	514000	530978.00
Clarke University - Dubuque, IA	25100	43332.59
Clemson University	411500	415577.90
Colby College	316000	334440.52
Colby-Sawyer College	13600	35016.34
Colgate University	498000	514917.88
College of Charleston	87600	88852.32
College of the Holy Cross	411000	428760.50
College of the Ozarks	-18000	-3751.04
Colorado School of Mines	850500	853019.88
Colorado State University (CSU) - Pueblo Campus	210500	216106.52
Colorado State University (CSU)	316500	319948.35
Columbia University	639000	663864.56
Columbus State University	159500	162989.65
Concord University	64750	68521.43
Concordia University - Irvine, CA	198000	210851.00
Concordia University - Mequon, WI	200000	210800.00
Concordia University - Saint Paul, MN	314000	321058.11
Converse College	-58100	-48777.71
Cornell University	625000	642817.75
Culver-Stockton College	-5000	8264.56
CUNY - City College	363500	369742.96

Curry College	197000	214196.00
D'Youville College	292000	304445.14
Dakota Wesleyan University	-68400	-56751.74
Dallas Baptist University	343000	345544.00
Dartmouth College	650000	674320.40
Davidson College	177000	197579.02
Defiance College	49500	66649.86
Delaware Valley College	74800	91477.69
DePaul University	358000	366189.24
DePauw University	291000	311915.40
Dickinson College - Carlisle, PA	203000	223799.35
Dickinson State University - Dickinson, ND	202500	205165.77
Dillard University	64600	76013.44
Drake University	287000	298197.61
Drexel University	483000	497888.97
Drury University	66800	76628.00
Duke University	633000	653267.19
Earlham College	62600	81624.06
East Tennessee State University (ETSU)	77250	80696.04
East Texas Baptist University (ETBU)	42500	47876.25
Eastern Connecticut State University	228000	231708.18
Eastern Illinois University	177500	182597.36
Eastern Kentucky University	169500	173658.47
Eastern Nazarene College	308000	322560.00
Eckerd College	186000	200451.60
Elizabeth City State University (ECSU)	-7900	-1399.87
Elmhurst College	189000	205958.48
Elmira College	42100	64331.55
Embry-Riddle Aeronautical University	546000	554716.90
Emmanuel College - Franklin Springs, GA	-81300	-71948.20
Emory University	379000	397367.20
Fairfield University	463000	475038.20
Fairleigh Dickinson University (FDU) - Madison, NJ	305000	329360.75
Fairleigh Dickinson University (FDU) - Teaneck, NJ	175000	199360.75
Fashion Institute of Technology	443500	446599.78
Faulkner University	50300	53271.14
Fayetteville State University	-750	5230.26
Felician College	447000	459346.97
Ferris State University	307500	310874.10
Fisher College	206000	215471.00
Flagler College - Saint Augustine, FL	69500	74698.42
Florida Atlantic University (FAU)	279500	283462.40
Florida Institute of Technology	493000	505971.85
Florida International University (FIU)	302000	305788.18
Florida Memorial University	-65900	-61905.62
Florida Southern College	72000	85497.15
Florida State University (FSU)	262500	266460.00
Fort Lewis College	153000	155620.32
Fort Valley State University	-33100	-28311.00

Freed-Hardeman University	64500	75380.22
Friends University	183000	189520.02
Frostburg State University	224000	228918.32
Gallaudet University	73000	89464.00
Gannon University	197000	213111.48
Gardner-Webb University	43800	49629.67
Geneva College	174000	187682.52
George Fox University	198000	211032.14
George Mason University	491500	495040.32
George Washington University (GWU)	420000	433625.55
Georgetown University	564000	579295.76
Georgia Institute of Technology	785000	789116.45
Georgia Southern University	200500	204821.17
Gettysburg College	304000	322814.40
Glenville State College	73150	78492.71
Gonzaga University	392000	403851.92
Gordon College - Wenham, MA	75700	88418.55
Goshen College	70200	86320.16
Graceland University	190000	204030.94
Grambling State University	56750	60517.43
Greenville College - Greenville, IL	75500	89649.84
Grove City College	374000	377242.70
Guilford College	20000	27023.16
Gwynedd-Mercy University	311000	326897.51
Hamilton College	509000	529076.00
Hamline University	46300	65977.84
Hampden-Sydney College	314000	332196.48
Harding University	194000	199963.36
Harris Stowe State University	-32550	-27496.30
Harvard University	700000	727809.10
Harvey Mudd College	962000	982297.49
Haverford College	357000	380004.50
Henderson State University	70950	71732.65
Hendrix College	59900	81503.21
Hofstra University	396000	408800.00
Hollins University	-51600	-27819.18
Holy Family University	285000	297433.88
Houghton College	53900	69540.80
Howard Payne University	45100	58688.68
Howard University	282000	289133.28
Humboldt State University	181500	188192.84
Hunter College	320500	325695.85
Huntington University	6900	18429.96
Illinois College	61700	80541.20
Illinois Institute of Technology	556000	576487.90
Indiana State University	200000	204124.39
Indiana University (IU) - Bloomington	343000	347577.20
Indiana University of Pennsylvania (IUP)	165500	169885.67
Indiana University-Purdue University - Indianapolis (IUPUI)	264500	270494.24

Iona College	357000	361669.58
Iowa State University	393000	396491.25
Jacksonville University	297000	310942.32
James Madison University	440000	442701.00
Johns Hopkins University	546000	564354.24
Johnson C Smith University	-4700	6240.93
Judson University - Elgin, IL	63000	66498.00
Juniata College	177000	198483.90
Kansas State University (KSU)	316500	318664.33
Keene State College	190500	195197.55
Kent State University (KSU)	157500	160925.31
Kentucky Wesleyan College	3500	18394.40
Keuka College	189000	197656.44
Knox College	53900	78394.74
La Roche College	35900	41620.46
La Salle University - Philadelphia, PA	339000	359836.20
Lafayette College	502000	514085.50
Lake Erie College	22400	38676.18
Lamar University	377500	381560.77
Lander University	74300	80693.47
Lasell College	66100	83096.98
Lawrence Technological University	523000	532402.83
Le Moyne College	180000	197520.12
Lee University - Cleveland, TN	59600	65537.76
Lehigh University	649000	663702.61
LeTourneau University	427000	439603.45
Lewis & Clark College	66700	84841.96
Limestone College	181000	193317.60
Lincoln University - Jefferson City, MO	59300	64171.34
Lindenwood University	179000	182352.16
Linfield College	190000	210381.68
Lipscomb University	196000	198642.85
Livingstone College	-148600	-138879.04
Lock Haven University	60150	64728.38
Louisiana Tech University	363500	368953.74
Loyola Marymount University	371000	382026.65
Loyola University - Baltimore, MD	438000	452900.05
Lynn University	19000	23296.13
Lyon College	56600	70364.00
Maine Maritime Academy	702500	707476.97
Malone University	74400	90799.05
Manchester College - North Manchester, IN	28700	47848.80
Mansfield University of Pennsylvania	81500	83920.64
Marist College	310000	319554.05
Marquette University	386000	397381.44
Mars Hill College	-6800	5446.00
Mary Baldwin College	26800	44513.20
Maryville College	43400	65496.20
Marywood University	13500	29493.28

Massachusetts Institute of Technology (MIT)	959000	986088.20
Massachusetts Maritime Academy	742500	748134.16
McKendree University	186000	199576.64
Menlo College	323000	339659.10
Mercy College	187000	195314.11
Meredith College	-16000	-508.10
Merrimack College	297000	310780.39
Miami University - Oxford, OH	425000	428328.71
Michigan State University (MSU)	360000	364684.18
Michigan Technological University	595000	599904.55
Middlebury College	324000	343815.40
Midwestern State University (MSU)	310000	314273.05
Millersville University of Pennsylvania	197500	201425.53
Millikin University	72000	79025.12
Milwaukee Institute of Art & Design	71100	87621.15
Milwaukee School of Engineering	590000	607749.50
Minnesota State University - Mankato Campus	282000	284919.24
Minnesota State University - Moorhead Campus	166000	167529.46
Misericordia University	179000	192407.93
Mississippi State University (MSU)	273500	277255.96
Mississippi University for Women	71000	74965.36
Molloy College	405000	415077.21
Montana State University - Main Campus	329500	331646.32
Montana Tech of The University of Montana	587000	589992.38
Montclair State University	331500	337348.92
Morehead State University (Kentucky)	31000	35191.66
Mount Ida College	6500	23220.62
Mount Marty College	29800	41593.91
Mount St. Mary's University - Emmitsburg, MD	180000	195574.56
Muskingum University	71900	88238.70
Neumann University	204000	210191.80
New College of Florida	158000	162769.28
New Jersey City University	268000	274880.44
New Jersey Institute of Technology	661500	670452.30
New Mexico Institute of Mining and Technology	601000	604114.10
New Mexico State University - Main Campus	332500	338121.12
New York Institute of Technology (NYIT)	414000	420016.94
Newberry College	-19800	-3504.90
Newbury College	60300	80003.64
Niagara University	38300	53398.40
North Carolina A&T State University	290500	296669.30
North Carolina State University (NCSU)	414000	418824.96
North Dakota State University (NDSU)	378500	381065.64
Northeastern University	445000	455187.58
Northern Illinois University (NIU)	297000	302883.06
Northland College - Ashland, WI	-36800	-17305.79
Norwich University	295000	316731.58
Notre Dame de Namur University (NDNU)	330000	346628.71
Oakland University - Rochester Hills, MI	315500	319176.20

Occidental College	205000	227498.00
Ohio State University (OSU) - Main Campus	324500	328892.08
Ohio University - Main Campus	290000	293775.80
Oklahoma State University (OSU) - Main Campus	315500	319146.50
Old Dominion University	298000	302627.26
Olivet College	53100	65303.46
Olivet Nazarene University	196000	213391.51
Oral Roberts University (ORU)	52700	64915.52
Oregon State University (OSU) - Main Campus	356500	360367.76
Ottawa University	470000	472141.02
Pace University - New York, NY	416000	434593.43
Pacific Union College (PUC)	305000	318947.39
Pennsylvania State University (Penn State) - Main Campus	395500	398556.24
Pepperdine University	319000	337327.36
Philadelphia University	178000	196672.00
Pikeville College	-118900	-101942.38
Pomona College	375000	402281.52
Prairie View A & M University	381500	388158.12
Princeton University	764000	792498.20
Providence College	336000	348676.80
Purdue University - Main Campus	506500	512130.94
Queens University of Charlotte	198000	210506.89
Quinnipiac University	294000	307399.44
Regis University - Denver, CO	395000	406779.94
Reinhardt University	60100	67522.20
Rensselaer Polytechnic Institute	676000	696202.59
Rhode Island College	204000	208245.80
Rice University	624000	637973.36
Ringling College of Art and Design	50100	60712.13
Ripon College	-14900	6370.41
Robert Morris University (RMU) - Chicago, IL	45300	53794.62
Roberts Wesleyan College	177000	191074.20
Rochester Institute of Technology (RIT)	445000	460549.00
Rockhurst University	352000	369111.50
Rocky Mountain College	67200	80605.10
Rose-Hulman Institute of Technology	738000	753179.40
Rowan University	271500	276889.65
Rutgers University - Camden Campus	280500	289402.08
Rutgers University - Newark Campus	426500	435714.92
Sacred Heart University - Fairfield, CT	315000	325750.82
Saint John's University (SJU) - Collegeville, MN	361000	380495.95
Saint Joseph's University (SJU) - Philadelphia, PA	301000	312940.48
Saint Louis University (SLU)	280000	294692.32
Saint Martin's University	314000	332572.49
Saint Mary's College of California	444000	460657.28
Saint Mary's University of Minnesota	288000	302571.33
Saint Norbert College	189000	203907.30
Saint Peters College	295000	320175.15
Salisbury University	272500	275702.79

Salve Regina University	175000	191474.15
San Diego State University (SDSU) - Main Campus	369500	374588.00
San Francisco Art Institute	52500	55754.90
San Francisco State University (SFSU)	377500	383507.98
San Jose State University (SJSU)	553500	560293.34
Santa Clara University	589000	598821.16
Sarah Lawrence College	53000	73879.40
Savannah College of Art and Design (SCAD)	24100	30862.49
Scripps College	179000	193313.60
Seattle University	315000	327991.00
Seton Hill University - Greensburg, PA	5800	21964.96
Shepherd University	170500	173713.00
Sonoma State University	323500	329181.76
South Dakota School of Mines & Technology	647000	649492.64
Southeastern Louisiana University	153000	156227.72
Southeastern Oklahoma State University	205500	206821.35
Southeastern University	35600	40410.31
Southern Adventist University	204000	211093.08
Southern Connecticut State University (SCSU)	167000	171448.13
Southern Methodist University (SMU)	317000	324107.20
Southern Utah University	218000	220765.07
Southwestern Adventist University	189000	196873.32
Southwestern College - Winfield, KS	306000	319520.85
Spring Hill College	35500	53062.30
St. Cloud State University	291500	294509.00
St. Francis College - Brooklyn Heights, NY	207000	211753.80
St. John's University - Queens, NY	329000	336521.59
St. Xavier University	195000	213270.56
Stanford University	761000	783607.00
State University of New York (SUNY) at Farmingdale	434000	437284.50
Stephens College	74700	85340.00
Stevens Institute of Technology	800000	807857.92
Stonehill College	338000	354261.05
Stony Brook University	467500	472058.00
Suffolk University	194000	201739.46
SUNY - Binghamton University	541000	545160.16
SUNY - College at Buffalo	77100	80942.28
SUNY - College at Cortland	90000	93636.30
SUNY - College at Oswego	161500	166352.90
SUNY - College of Agriculture and Technology at Cobleskill	90000	93249.76
SUNY - College of Technology at Alfred	272599	278012.08
SUNY - Fredonia	72600	76520.58
SUNY - Geneseo	280500	281553.74
SUNY - Maritime College	876000	877834.47
SUNY - New Paltz	163000	165808.96
SUNY - Purchase College	205000	210883.18
Susquehanna University	198000	223185.72
Swarthmore College	431000	455589.44
Sweet Briar College	75900	97966.20

Syracuse University	342000	357304.64
Tarleton State University (TSU)	220500	224830.62
Taylor University - Upland, IN	197000	207476.63
Temple University	279500	284003.07
Tennessee State University	214500	219152.98
Tennessee Technological University (TTU)	339500	343286.72
Texas A&M International University	190000	195778.34
Texas A&M University - Commerce Campus	210500	216485.36
Texas A&M University - Corpus Christi Campus	285500	289760.48
Texas A&M University - Kingsville Campus	303500	308967.70
Texas A&M University - Main Campus	534500	538901.91
Texas Christian University (TCU)	303000	312792.79
Texas State University - San Marcos Campus	278000	281986.01
Texas Tech University	420500	424169.61
Texas Woman's University	286500	291561.15
The Baptist College of Florida	-95300	-91314.52
The Citadel - Military College of South Carolina	403000	411884.70
The College of New Jersey (TCNJ)	419000	424855.99
The College of Saint Rose	50700	57866.88
The College of William and Mary	447500	452986.58
The Sage Colleges	62700	75371.75
The University of Montana Western	-27350	-24890.20
Thomas More College	370000	382372.06
Toccoa Falls College	-67300	-59658.79
Tougaloo College	-72700	-70256.00
Touro College	463000	468875.00
Towson University	300500	305108.88
Trinity College	346000	367509.76
Trinity University	336000	349259.96
Tufts University	456000	470891.76
Tulane University	318000	328560.96
Union College	453000	472108.96
United States Merchant Marine Academy	1056000	1056512.52
Unity College	-66000	-54623.19
University at Albany, State University of New York (SUNY)	359500	364466.40
University at Buffalo (UB)	352500	356342.28
University of Akron - Main Campus	264500	268182.53
University of Alabama - Birmingham Campus	199500	202412.75
University of Alabama - Main Campus	259500	265259.88
University of Alabama in Huntsville	476000	479743.00
University of Arkansas - Little Rock Campus	173000	178706.88
University of Arkansas - Main Campus	323500	326380.25
University of Arkansas - Pine Bluff Campus	60700	63923.35
University of California - Berkeley	685000	694822.24
University of California - Davis	425000	436145.31
University of California - Irvine	451500	463755.36
University of California - Los Angeles	480500	491267.35
University of California - Riverside (UCR)	308000	322265.42
University of California - San Diego (UCSD), Warren College	576500	586442.48

University of California - Santa Barbara (UCSB)	441500	452519.42
University of California - Santa Cruz (UCSC)	302000	314625.83
University of Central Florida (UCF)	259500	262950.16
University of Central Missouri	180000	182634.59
University of Central Oklahoma (UCO)	170500	172573.66
University of Charleston (West Virginia)	74200	78700.00
University of Chicago	365000	383830.56
University of Cincinnati (UC)	376500	379534.08
University of Colorado - Boulder (CU)	386500	390248.84
University of Connecticut	425000	430687.82
University of Dayton	374000	384656.36
University of Delaware	440000	444361.60
University of Dubuque	3900	19626.48
University of Florida (UF)	365000	368364.44
University of Georgia (UGA)	315500	319419.88
University of Hartford	315000	330038.00
University of Houston	444000	448710.18
University of Idaho	336500	339361.30
University of Illinois at Chicago	373000	382407.51
University of Illinois at Urbana-Champaign	532000	538231.99
University of Iowa (UI)	333000	336551.52
University of Kansas	336000	339357.54
University of Kentucky (UK)	276500	279347.00
University of Louisiana - Monroe Campus	282000	283425.06
University of Louisville	223000	228316.28
University of Maine at Farmington (UMF)	41450	47311.80
University of Maine at Fort Kent (UMFK)	86200	90666.64
University of Maryland - College Park	510500	514569.25
University of Massachusetts (UMass) - Amherst Campus	385000	390855.85
University of Massachusetts (UMass) - Dartmouth Campus	330000	337228.51
University of Massachusetts (UMass) - Lowell Campus	524500	529726.96
University of Michigan - Ann Arbor	477000	483539.01
University of Minnesota - Duluth Campus	285000	289489.52
University of Minnesota - Morris Campus	206000	212258.90
University of Minnesota - Twin Cities	418500	423367.20
University of Mississippi	217500	221609.28
University of Missouri - Columbia	332500	337011.22
University of Missouri - Kansas City (UMKC)	309500	313862.72
University of Montana	144000	146735.43
University of Montevallo	-23400	-17817.80
University of Mount Union	175000	188831.32
University of Nebraska - Lincoln	318000	321141.18
University of Nevada - Las Vegas (UNLV)	298500	302994.00
University of Nevada - Reno (UNR)	315000	317700.00
University of New Hampshire (UNH) - Main Campus	308500	312450.10
University of New Orleans (UNO)	282000	285690.36
University of North Carolina at Asheville (UNCA)	39150	43119.84
University of North Carolina at Chapel Hill (UNC)	302500	310054.96
University of North Carolina at Charlotte (UNCC)	322500	326572.78

University of North Dakota	317000	319489.59
University of North Texas (UNT)	265500	269931.78
University of Northern Iowa	198500	201186.98
University of Notre Dame	546000	563947.20
University of Oklahoma	382000	384604.06
University of Oregon	241500	244994.40
University of Pennsylvania	673000	694071.52
University of Pittsburgh - Main Campus	337500	342380.00
University of Rhode Island (URI)	344000	351897.50
University of Richmond	409000	425348.34
University of Rochester	359000	379015.46
University of San Diego (USD)	330000	343274.50
University of San Francisco (USF)	440000	451798.05
University of Science and Arts of Oklahoma	-60150	-54255.09
University of Scranton	302000	317990.80
University of Sioux Falls (USF)	35000	46018.16
University of South Carolina - Aiken Campus	-19650	-14856.79
University of South Carolina - Upstate Campus	172500	176182.85
University of South Florida - Main Campus	282500	286717.40
University of South Florida - St. Petersburg Campus	168000	172068.90
University of Southern California (USC)	448000	461151.88
University of St. Thomas - Houston, TX	297000	310457.28
University of St. Thomas - St Paul, MN	345000	356411.68
University of Tennessee at Chattanooga (UTC)	160000	164671.38
University of Tennessee	228000	233660.80
University of Texas (UT) - Austin	464500	468334.80
University of Texas at Arlington (UTA)	414000	419555.94
University of Texas at Dallas	456500	472629.92
University of Texas at El Paso (UTEP)	291500	297497.92
University of the Pacific (UOP)	388000	405399.73
University of Toledo	294500	299987.93
University of Tulsa	330000	332385.18
University of Utah	387500	390733.34
University of Vermont (UVM)	278500	287127.34
University of Virginia - Wise	57900	63201.45
University of Virginia (UVA) - Main Campus	545000	551713.60
University of Washington (UW) - Main Campus	490500	496050.00
University of West Alabama	24950	28792.25
University of Wisconsin (UW) - Madison	372000	375830.05
University of Wisconsin (UW) - Oshkosh Campus	207000	211156.80
University of Wisconsin (UW) - Stout Campus	294500	297095.45
University of Wisconsin (UWEC) - Eau Claire	318500	321581.93
University of Wisconsin (UWP) - Parkside	185500	189420.64
University of Wyoming (UW)	325000	327351.70
Utah State University - Regional Campuses and Distance Education	373000	375458.62
Valdosta State University (VSU)	75300	79536.05
Valley City State University	71100	74481.40
Vanderbilt University	472000	492252.19
Vassar College - Poughkeepsie, NY	181000	211192.64

Vaughn College of Aeronautics and Technology	374000	381421.26
Villanova University	554000	568333.59
Virginia Military Institute	617000	623339.00
Virginia Union University (VUU)	4000	12791.29
Virginia Wesleyan College (VWC)	26900	46247.10
Wabash College	516000	535253.02
Wagner College	321000	335786.20
Wake Forest University	437000	450520.65
Walla Walla University	295000	299053.76
Walsh University - Ohio	207000	210729.60
Warren Wilson College	-3200	13262.08
Washburn University	198500	201635.40
Washington Adventist University	481000	485750.00
Washington and Lee University	542000	559762.64
Washington State University (WSU)	359000	364867.68
Washington University in St. Louis	430000	447013.78
Wayland Baptist University	311000	319072.72
Wayne State College - Wayne, NE	76900	79783.88
Wayne State University - Detroit, MI	284000	288889.52
Webb Institute	854000	854609.00
Webber International University	75500	87389.51
Weber State University	414500	416638.24
Wentworth Institute of Technology	516000	520446.40
West Virginia State University	58400	62478.69
West Virginia University (WVU) - Main Campus	338500	341134.50
Western Connecticut State University	327000	330552.34
Western Kentucky University	180500	183665.90
Western Michigan University (WMU)	261000	264494.70
Western New England College	321000	337080.48
Western Oregon University	99850	105295.60
Western State Colorado University	79100	83317.43
Western Washington University	308500	312729.53
Westfield State University	196500	200029.66
Wheaton College - Wheaton, IL	194000	205135.88
Wheelock College	-129600	-111853.32
Wichita State University	265000	266671.54
Wilkes University	198000	214193.60
William Paterson University	288000	293975.05
William Woods University	-2600	8044.21
Williams College	504000	528442.50
Winthrop University	99850	106320.56
Wittenberg University	197000	216971.99
Woodbury University	199000	215731.96
Worcester Polytechnic Institute	752000	766449.05
Wright State University - Main Campus	266000	269832.84
Xavier University	208000	221005.92
Yale University	626000	651282.50
Yeshiva University	556000	569197.27