

A COMPARISON OF FOUR AND SIX-YEAR GRADUATION RATES AT COLLEGES AND UNIVERSITIES

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ABSTRACT

Tuition at colleges and universities has increased enormously over the past few decades. Thus, more than ever before, it is very important for students to not just graduate, but graduate in the expected four years to minimize tuition payments and lessen student debt. When institutions of higher education recruit students they state that they will be the 'Class of 202' assuming that they graduate in four years. However, these same schools report graduation rates at 150 percent of the expected completion time, which is in six years. Thus, there is a disconnect between the implied, promised graduation rate and the actual graduation rate provided to the public. This research examines factors that differ on the impact of the reported six-year graduation rates and four-year ones.*

JEL: A20, A22, Z18

KEYWORDS: Graduation Rates, Colleges, Universities, Higher Education

INTRODUCTION

Over the past two decades there has been a significant amount of research on higher education focusing on dozens of areas. The most recent lines of inquiry have explored the inequities faced by historically marginalized groups and developing programs that provide more access to these groups. Related, since a significant number of students feel there is a lack of support, there is a growing interest in addressing Diversity, Equity and Inclusion issues. In addition, there is growing concern about the mental health of college students, particularly depression and anxiety, impacting students, which has only been exacerbated by the pandemic.

However, perhaps the largest concern for most colleges and universities, their administrators and students is the large increases in tuition over the past twenty years. Students, and their parents are increasingly questioning the value of a college degree. In order to minimize the amount of money spent on tuition it is imperative that students graduate in the shortest amount of time, which ideally is the standard, expected, in four years.

There are other obvious additional benefits to completing a degree in four, instead of five or six years. It can greatly reduce a student's debt, which is a huge and growing problem for millions of individuals. The additional year or two can be used for other activities. For some it may be a 'gap year' to travel or to do volunteer work. For others, it means that graduate or law school can begin earlier. And for the majority of individuals it allows them to start their careers sooner, thus giving them more time to advance in their chosen areas, add more human capital and increase wages.

TIAA Institute published a recent report addressing the need for colleges and universities to do a better job of providing improved outcomes for students. Creighton, et. al. (2021) in a study of the New American

Colleges and Universities (NACU) look at the cost of delivering a degree. They look at efficiency based factors such as the cost of attending, expenses, total enrollment, demographics and financial aid. Applying metrics used in other businesses they determine the Return on Investment (ROI) based on Net Tuition revenue minus Instructional Expenses divided by Institutional Expenses. The authors' find that schools that use data to make decisions and focus on cost containment perform better than other schools. In addition to better serving students, being more efficient means that these institutions are better prepared for the future. My paper provides another metric that shows how well colleges and universities are serving their students. This research looks at what variables are more likely to increase graduation rates in four, not six, years. In addition to helping families prepare for college, it is also useful for administrators and policy makers.

The next part of this paper provides a literature review on graduation rates of colleges and universities, mostly focusing on articles using regression. Next, I discuss the data used in the analysis, why this research is unique and summarize the variables. Then I explain, the econometrics used and results. I finish the paper with how my findings add to the literature, the limitations to this research and provide suggestions for future areas of study.

LITERATURE REVIEW

There is a large and growing volume of literature on graduation rates at institutions of higher education in the United States. Early papers focused on how specific programs can impact the graduation rate at a particular school. Over the past decade there has been much about the use of High Impact Practices (HIPS) on the importance of mentoring, advising, new student orientation, tutoring, internships and other actively intensive programs. Some individuals, particularly those from disadvantaged back grounds are not only less likely to attend college but also are also less likely to finish. So there are studies looking at programs improving outcomes for first-generation students and minorities.

The majority of studies analyzing graduation rates rely on case studies, anecdotal evidence, qualitative analysis or look at one or a small number of schools. Regression is a valuable econometric technique used for predicting particular outcomes holding other variables constant. Over the past ten years, there has been more research using regression with data sets examining graduation rates from a macro level.

Some researchers are skeptical about the validity of results using regression. Horn and Lee (2016) show that if the model is identified appropriately it does give correct results. Pike and Graunke (2015) control for time-invariant characteristics, time-varying institutional and time-varying cohort characteristics. Results from this research finds that differences in average student ACT and SAT scores mainly determine retention rate differences.

Anstine (2013) examined almost 1,400 institutions of higher education. Results showed that the percentage of faculty that is full-time positively impact graduation rates. He also examined the relative importance of some HIPS on graduation rates. Holding constant dozens of variables such as standardized test scores, teaching centers and learning groups do not increase graduation rates overall for colleges and universities. But if institutions are examined separately using interaction terms these variables do improve outcomes for comprehensive universities but not for research universities or liberal arts colleges.

Millea et. al. (2018) also use regression to look at retention and graduation rates at one school from 1998 to 2004. As with all research on the topic, they find that academic variables such as higher high school GPA and ACT scores significantly impact graduation rates. In addition, they conclude that if their school had smaller class sizes and provided more financial aid, this would also improve outcomes. This makes sense, however, most schools do not have the resources available to implement this suggestion.

Over thirty states tie some funding of public colleges to their performance, usually measured by six year graduation rates. In Crisp, et. al. (2018) regression analysis they determine the variables of most importance for a non-selective college. As with other studies they find that the percentage of students who are full time, socio-economic variables and institutional revenue all increase graduation rates. In addition, they find that religious affiliation also has an impact.

Hester and Ishitani (2018) believe that efficiency can be measured by determining what variables are statistically significant in predicting six year graduation rates. Results show that executive to staff ratios, faculty teaching load and class size all improve retention and graduation. Importantly, where money is spent matters. Support for instruction improves outcomes, but money spent on research, public service and student services does not.

Hajrasouliha and Ewing (2016) look at retention and graduation through the lens of a college campuses design. As with research using regression, they find that campus living, the percentage of students living on campus in particular increases outcomes. In addition, they look at how land is used, how spread out the campus is, how connected it is, its configuration and greenness. They also find that ‘greener’ campuses and those in a more urban area also contribute to student satisfaction.

All of the studies discussed in this literature review (and as far I as I know all other research in this area) has only examined graduation rates over a six year period of time. This research adds to the body of knowledge by also looking at the factors that determine graduation rates in four years.

DATA AND METHODOLOGY

This research builds on a previous paper by Anstine and Seidman (2017). In that paper, the author’s looked at the relative importance of social and financial variables in determining graduation rates. Variables such as standardized test scores, class size and demographic characteristics all known to be important were held constant. Results showed that while the total number of male and female sports was statistically significant it was financial characteristics that had the largest impact on graduation rates. Schools with higher percentages of students receiving Pell Grants and those with need based financial aid had significantly lower graduation rates than other colleges and universities.

The data used in this paper was obtained from five different sources, then organized in Excel and transferred to SPSS for the econometrics. With the help of a student researcher I started with data from the U.S. News and World Report, since this source had the majority of the variables needed for the analysis. There were some missing variables and observations so we then went directly to the U.S. Department of Education to fix this. The Integrated Post-Secondary Education Data System (IPEDS) has information from four-year institutions on graduation rates, student faculty ratio and dozens of other variables. It should be noted that the U.S. News and World Report also gets its data from IPEDS, thus the data is correct and consistent. All of the data was collected in the summer of 2016.

Information about faculty salaries is from The Chronicle of Higher Education. From 2012 to the present there has been information on almost 4,000 colleges and universities published annually available for purchase. The data includes information on salary by rank, Assistant Professor, Associate Professor and Full Professor. Since there is a large degree of multi-collinearity between the three types, I have only included Associate Professors salary in the data. The link to the document is in the references.

The Carnegie Foundation classification system provided data on the type of institution each school is: National University, Regional University or Liberal Arts College. The Carnegie Foundation for the Advancement of Teaching and the American Council on Education (ACE) have collected this data since 1973 and update it approximately every four or five years to ensure its accuracy.

Table 1: Description of Structural, Selectivity and Demographic Variables

Variable	Description of Variables	Data Source	Numb Obs	Min	Max	Mean	Number
GradRate4years	Four year graduation rate at each school.	US News (from IPEDS)	277	0.02	0.90	0.44	
GradRate6years	Six year graduation rate at each school.	US News	277	0.07	0.95	0.59	
STRUCTURAL							
Regional	If the school is a regional university (yes=1)	Carnegie Foundation	277	0	1	0.56	155
LibArt	If the school is a Liberal Arts College (yes=1)	Carnegie	277	0	1	0.23	64
National	If the school is a national university (yes=1)	Carnegie	277	0	1	0.21	55
Private	If the school is Private (yes=1)	Author	277	0	1	0.67	185
Urban	If the school is in an urban location (yes=1)	Author	277	0	1	0.46	127
Suburban	If the school is suburban (yes=1)	Author	277	0	1	0.25	66
Rural	If the school is in a rural location (yes=1)	Author	277	0	1	0.29	80
IA	If the school is in Iowa (yes=1)	Author	277	0	1	0.09	22
IL	If the school is in Illinois (yes=1)	Author	277	0	1	0.16	45
IN	If the school is in Indiana (yes=1)	Author	277	0	1	0.12	33
KY	If the schools is in Kentucky (yes=1)	Author	277	0	1	0.09	22
MI	If the school is in Michigan (yes=1)	Author	277	0	1	0.11	31
MN	If the schools is in Minnesota (yes=1)	Author	277	0	1	0.08	23
MO	If the school is in Missouri (yes=1)	Author	277	0	1	0.11	31
OH	If the school is in Ohio (yes=1)	Author	277	0	1	0.14	39
WI	If the school is in Wisconsin (yes=1)	Author	277	0	1	0.10	28
SELECTIVITY							
Retention	The percentage of first-time, full-time undergraduate students who returned to school for their second year.	USNews-IPEDS	277	0.46	0.99	0.764	
PerClsU20	Percentage of classes with fewer than 20 students	USNews-IPEDS	277	0.234	0.94	0.570	
StudFac	Student faculty ratio	USNews-IPEDS	277	6	26	14.01	
AccpRate	Percent of students accepted out of those who applied	USNews-IPEDS	277	0.07	1	0.688	
Ave ACT	The average ACT scores of the entering students.	USNews-IPEDS	277	16	33	23	
Fresh10	Percentage of students who were in the top 10 percent of their high school class	USNews-IPEDS	277	0.02	0.98	0.225	
DEMOGRAPHIC							
PerFemale	Percentage of students who are female	USNews-IPEDS	277	0	1	0.557	
OutState	Percent of students from another state.	USNews-IPEDS	277	0	0.93	0.274	
IntNatl	Percentage of students from another Country	USNews-IPEDS	277	0	0.30	0.04	
Black	Percentage of students who reported Black	USNews-IPEDS	277	0	0.83	0.081	
Asian	Percentage of students who reported Asian	USNews-IPEDS	277	0	0.23	0.028	
Hispanic	Percentage of students who are Hispanic	USNews-IPEDS	277	0	0.44	0.058	
White	Percentage of students who reported White	USNews-IPEDS	277	0.25	0.97	0.727	
Other	Percentage of students who reported as Native American, Pacific Islander, Multiracial, or did not report	USNews-IPEDS	277	0	0.3	0.067	

Table 1 provides an overview of the data used in the analysis. The first and second columns in this table lists and defines the structural, selectivity and demographic variables. Structural variables are those Column one and two list the variables. Structural variables do not change. Selectivity are quality indicators. Demographic provides information on the types of students. Column three lists the source of the data, followed by the number of observations, minimum and maximum values, the mean and, if applicable the number in the category. .

The data is from schools in the Midwestern U.S. See the appendix for more details on this. Thus, community colleges, universities that specialize in only upper level transfer students and graduate schools, and all those dedicated to Cooking, Art and Business, in addition to for-profit schools are not included. This paper focuses on the top four-year institutions of higher learning in the Midwest United States. Thus, it is only non-profit, public and private colleges and universities in the study.

There are likely differences between colleges and universities in states due to economic and political characteristics. The location of the state it is in was calculated directly by the author. Geography with respect to density may also be important so I looked up if the schools are located in urban, suburban or rural areas. There are a total of two hundred and seventy seven schools in the data set.

Table 1 and Table 2 define each variable, gives it source, the minimum and maximum values, then the mean and the number in the category if it is qualitative. The first two variables provided are the graduation rates of each school in four years and six years. It is interesting to note that the difference between the two averages is an astonishingly high fifteen percentage points, whereas the minimum and maximum only differ by five percentage points.

Table 2: Description of Faculty, Student Body and Financial Variables

Variable	Description of Variables	Data Source	Numb Obs	Min	Max	Mean
FACULTY						
PerFTFac	Percent of faculty that is full time	USNews-IPEDS	277	0.249	1	0.790
AassocProf	Average Associate Professor Salary	Chronicle of Higher Education	277	36549	117600	66293
STUDENT BODY						
Students	Number of undergraduate students	USNews-IPEDS	277	543	44201	6057
PerLiveOn	Percentage of students who live in campus housing	USNews-IPEDS	277	0	1	0.502
StudOrg	Number of student organizations per capita	USNews-IPEDS	277	4	21	15.41
PerFrat	Percent of male students in a Fraternity	USNews-IPEDS	277	0	0.77	0.088
PerSor	Percent of female students in a Sorority	USNews-IPEDS	277	0	0.67	0.095
MAatIPerCap	Male Athletes per capita	USNews_IPEDS	277	0	0.44	0.11
FAthIPerCap	Female Athletes per capita	USNews_IPEDS	277	0	0.3	0.07
PerStudFT	Percentage of undergraduates who attend full-time	USNews-IPEDS	277	0.007	1	0.834
FINANCIAL						
PerHaveNBA	Percent determined to have financial need	USNews-IPEDS	277	0.37	1	0.715
Pellgrant	Percentage of undergraduates receiving a Pell Grant	USNews-IPEDS	277	0.062	0.926	0.342
PerBorrow	Percent of graduating students who have borrowed	USNews-IPEDS	277	0.08	0.96	0.722
PerCapEndow	End-of-year endowment value per full-time equivalent student	USNews-IPEDS	277	507	950232	45944
ALUMGvRt	Percentage of alumni who give to the school	USNews-IPEDS	277	0.01	0.51	0.129

Table 2 continues providing an overview of the data. Column one and two list the variables. Faculty gives percentage full time and salary. Student body variables look at the relative importance of student groups and other items that connect students to their college. Financial shows how well off schools are and the number of lower income students. Column three gives the source of the data, next is the number of observations, then minimum and maximum values, the mean.

To simplify the large number of variables I have put them into categories. Structural are variables that do not change, such as the type of institution, public or private and location, urban, suburban or rural. Selectivity variables include the retention rate, student faculty ratio and percentage of students in the top ten percent of their high school class.

Demographic variables include the percentage of students who are: female, out of state and international and reported ethnic background. Faculty variables show the percentage of faculty that is full time and the average associate professors salary. Student body variables provide information on social factors of the schools, such as the percentage of students in Greek life, percentage that live on campus and per capita number of athletes. Financial variables include the percentage of students receiving Pell Grants and the school's per capita endowment.

Since this is the first paper comparing four and six-year graduation rates it is worthwhile to examine some simple statistics. The (statistically significant) correlation coefficient between the four and six year graduation rates is 0.9. This makes perfect sense, we would expect it to be high, but not perfect. If the correlation was one there would be no difference in the variables that impact four and six year graduation rates thus showing the importance of this study.

I then calculated the difference between each schools six year and four year graduation rates to see what schools had the smallest difference between the two and those that had the largest to see if any patterns exist. Not surprisingly, of the top thirty-five with the numbers closest together almost all were true Liberal Arts colleges, with Center College, Hanover and Macalester all just two percentage points different between the two years. These schools do not offer degrees in Engineering and other areas that typically take over four years to complete. In addition, they tend to bring in students from more well to do families, from good high schools that prepare them specifically for college. They also have large endowments that enable them to subsidize other high achieving students. The University of Norte Dame and the University of Chicago, both with a five percentage point's difference were the only two schools in the top twenty-five that are not Liberal Arts colleges.

There are seventeen schools with a difference of thirty percentage points or more, between their four and six year graduation rates and another twenty with a difference of twenty-five to twenty-nine. The largest was Kettering University in Michigan which had a difference of fifty-two percent. (I double checked data). The majority of these institutions are comprehensive universities, such as the University of Wisconsin schools and those in Michigan such as Grand Valley State and Western Michigan University. Again, this is not surprising since these schools tend to be less selective, admitting a higher percentage of middle and lower class students, many of whom have to work to pay for school thus taking more time to complete.

RESULTS

Regressions below examine the impact of different variables on colleges and universities four-year graduation rate (equation one) and six-year graduation rate (equation two). Due to multi collinearity not all variables that are listed in Tables 1 and 2 were included. None-the-less there are more variables for this analysis than in the majority of studies using regression. A total of forty-five explanatory variables were included. Both regressions had identical independent variables where I included all control variables such as standardized test scores, demographic characteristics, student body information and socio-economic data. I will first discuss the similarities of the regressions, then the differences.

$$4 \text{ Year Graduation rate}_i = \beta_0 + \beta_1 \text{ Structural} + \beta_2 \text{ Selectivity} + \beta_3 \text{ Demographic} + \beta_4 \text{ Faculty} + \beta_5 \text{ Student Body} + \beta_6 \text{ Financial} + \epsilon_i \quad (1)$$

$$6 \text{ Year Graduation rate}_i = \beta_0 + \beta_1 \text{ Structural} + \beta_2 \text{ Selectivity} + \beta_3 \text{ Demographic} + \beta_4 \text{ Faculty} + \beta_5 \text{ Student Body} + \beta_6 \text{ Financial} + \epsilon_i \quad (2)$$

One method of determining how good econometric results are is to compare them to comparable existing research. In both of the regressions with six year and four-year graduation rates as the dependent variable, all of the main control variables all have the expected sign and are statistically significant. It is well known

that schools with higher standardized test scores (ACT and/or SAT) have higher graduation rates than colleges and universities with lower scores which is the case in both regressions. In addition, socio-economic variables such as the percent of students receiving need based aid and Pell Grants negatively influence graduation rates. This is also consistent with all studies using these variables looking at graduation rates with regression (see the articles in the literature review for some examples).

Table 3: Regression with Graduation Rate in Four Years as Dependent Variable

Independent Vars	Coefficients	Std. Error	T-statistics
Intercept	-0.559	0.169	-3.301
LibArts ^a	0.036	0.018	2.017**
National	0.008	0.017	0.467
Private (yes=1)	0.102	0.024	4.243***
Urban ^b	-0.011	0.013	-0.858
Suburban	-0.015	0.016	-0.933
IA ^c	-0.019	0.026	-0.731
IN	0.030	0.026	1.156
KY	-0.115	0.026	-4.403***
MI	-0.084	0.022	-3.830***
MN	-0.001	0.026	-0.020
MO	-0.067	0.025	-2.721***
OH	-0.044	0.021	-2.036**
WI	-0.072	0.024	-3.025***
PerclsU20	-0.037	0.059	-0.618
StudFac	0.000	0.003	0.129
AccptRate	0.038	0.039	0.963
AVEACT	0.028	0.004	6.275***
PerFemale	0.331	0.063	5.257***
OutState	0.007	0.036	0.198
INatl	-0.090	0.161	-0.561
Black ^d	-0.093	0.085	-1.094
Asian	-0.189	0.218	-0.866
Hispanic	-0.224	0.124	-1.809**
Other	-0.127	0.129	-0.982
PerFTFac	-0.007	0.062	-0.113
AssocProfSal	0.0000024	0.000	3.131***
PerStudsFT	0.001	0.000	1.358
PerLVonCamp	0.085	0.035	2.405***
PerHaveNeed	-0.175	0.082	-2.136**
PerCapOrgs	1.944	1.352	1.438
PerFrat	0.073	0.104	0.709
PerSor	-0.012	0.096	-0.125
MAtlPerCap	0.182	0.130	1.404
FAthPerCap	0.004	0.205	0.018
PellGrant	-0.002	0.001	-2.412***
PerBorrow	0.032	0.061	0.522
PerCapEnd	0.00000059	0.000	0.730
<u>AlumGiveRt</u>	<u>0.180</u>	<u>0.104</u>	<u>1.732</u>

* Number of observations: 276; R-Squared: 0.867; Adjusted R-Squared: 0.846; F-Statistic: 40.8

*This table shows the regression with the Four-Year Graduation Rate as the dependent variable. The excluded category for the type of school is Regional (a). Rural is the omitted classification for location (b). Illinois is the excluded category for states (c). The excluded category for race is white (d). I follow the standard format for levels of statistical significance for one-tailed tests: * the 10% level, ** the 5 percent level, and *** the 1% level.*

There are other independent variables in my regressions that also have the anticipated sign and are statistically significant. We would expect that institutions that pay their faculty more have workers who are more committed to their school and be more involved with students. This is the case, where professors' salaries positively impact graduation rates. In addition, the dummy variable coefficient of if the school is private the graduation rate is higher and statistically significant. It is interesting that the difference is about ten percent higher with the dependent variable as four-year graduation rate and only six percent higher with the dependent variable as six-year graduation rate.

It has been documented that some demographic characteristics are important in determining graduation rates. Both of my regressions confirm this, with colleges that have a higher percentage of female students having higher graduation rates. In addition, schools that are more social or connected have improved outcomes over those that are less connected. The variable, percentage of students living on campus also positively impacts graduation rates.

Though not perfect, R-squared and Adjusted R-squared provide a good measure of how much all of the independent variables explain the schools graduation rates. The R-squared for both regressions is very high, 0.867 (four year) and 0.872 (six year) providing more evidence of the impact of the large number of variables in explaining graduation rates. The corresponding Adjusted R-squared are 0.846 and 0.852 showing the included variables are relevant.

While this data has a large number of variables, there are certainly others that would be useful such as information on unemployment rates and other economic factors that may influence students dropping out of college. While not perfect, the information on states provides a proxy for some of this. Compared to Illinois, Kentucky, Missouri and Ohio all have negative and statistically significant coefficients in both the four year and six year regressions.

It is possible that this is picking up some of the economic, social and demographic differences between states. For example, Illinois has a large number of corporate headquarters, has a significant number of technology jobs and a relatively diversified economy compared to Kentucky, Missouri and Ohio, thus possible making it more attractive to stay in school and graduate. In addition, Illinois is a solid Blue state, consistently voting Democratic compared to the other three states that are Red or Purple possibly showing how education, voting and politics may be related to if students are more or less, likely to stay in school and graduate.

The coefficients that are different between the regressions with the dependent variable as four year and six years graduation rates are if the school is Liberal Arts (positive and statistically significant for four year, not statistically significant for six) and Michigan and Wisconsin (negative and statistically significant for four year, not statistically significant with six.) This is not surprising given that the visual inspection of each school individually showed this to be the case. Controlling for the type of university and other variables, it may be the case that students in these more 'Blue Collar' worker states will graduate but take longer than the four years to do so.

Many First-generation students tend to be pragmatic and realistic when pursuing a degree in higher education. Quite a few seek degrees in Nursing, Management, Accounting and other 'practical' areas. Whereas students attending Liberal Arts colleges get degrees in Philosophy and other disciplines to learn for the sake of learning or are preparing for Law School or another graduate degree. Results imply that students from more privileged backgrounds can focus on their classes more than others from less affluent backgrounds.

It is also well documented that certain minorities, including Hispanic and Black students graduate at lower levels than other groups. The Hispanic coefficient is negative in both regressions, but its level of statistical

significance is at the five percent level with the dependent variable as four-year graduation rate, but only at the ten percent level with the dependent variable as six-year graduation rate. The Black coefficient is not statistically significant in Table 3 but is in Table 4, as is the other category.

Table 4: Regression with Graduation Rate in Six Years as Dependent Variable

Independent Vars	Coefficients	Std. Error	T-statistics
Intercept	-0.268	0.69	-1.972
LibArts ^a	0.004	0.009	0.251
National	0.008	0.019	0.570
Private (yes=1)	0.065	0.185	3.349***
Urban ^b	-0.002	-0.006	-0.174
Suburban	-0.006	-0.015	-0.451
IA ^c	0.002	0.003	0.080
IN	0.025	0.050	1.232
KY	-0.088	-0.150	-4.175***
MI	-0.019	-0.037	-1.092
MN	-0.016	-0.026	-0.753
MO	-0.042	-0.081	-2.148**
OH	-0.036	-0.076	-2.076**
WI	0.004	0.008	0.222
PerclsU20	-0.059	-0.056	-1.248
StudFac	0.000	-0.007	-.151
AcceptRate	0.015	0.015	0.474
AVEACT	0.031	0.560	8.777***
PerFemale	0.181	0.118	3.589***
OutState	-0.060	-0.081	-2.069***
INatl	0.085	0.021	0.662
Black ^d	-0.195	-0.095	-2.863
Asian	-0.172	-0.036	-0.980
Hispanic	-0.146	-0.050	-1.474*
Other	-0.239	-0.065	-2.309**
PerFTFac	0.017	0.014	0.734
AssocProfSal	0.00000178	0.000	2.898***
PerStudsFT	0.000	0.032	0.958
PerLVonCamp	0.061	0.099	2.164**
PerHaveNeed	-0.183	-0.141	-2.786***
PerCapOrgs	1.590	0.062	1.466*
PerFrat	0.068	0.083	0.820
PerSor	-0.009	-0.007	-0.116
MAtlPerCap	0.034	0.020	0.326
FAthPerCap	-0.058	-0.021	-0.353
PellGrant	-0.001	-0.080	-2.023**
PerBorrow	0.054	0.042	1.103
PerCapEnd	0.000000049	0.000	0.029
<u>AlumGiveRt</u>	<u>0.033</u>	<u>0.017</u>	<u>0.392</u>

Number of observations: 276; R-Squared: 0.872; Adjusted R-Squared: 0.852; F-Statistic: 42.7

*This table shows the regression with the Six-Year Graduation Rate as the dependent variable. The excluded category for the type of school is Regional (a). Rural is the omitted classification for location (b). Illinois is the excluded category for states (c). The excluded category for race is white (d). I follow the standard format for levels of statistical significance for one tailed tests: * the 10% level, ** the 5 percent level, and *** the 1% level.*

While almost all of the signs on the coefficients and statistical significance of the explanatory variables in both regressions make perfect sense, there are two exceptions. We would expect that alumni who had a good experience at their college would be more likely to donate to it. The coefficient for alumni giving is positive and statistically significant in the four-year dependent variable regression, as expected, but is not in the regression with the six-year dependent variable regression.

Another variable that we would expect to be consistent in the two regressions is the percentage of students that are out of state. This coefficient is negative and statistically significant in Table 4. Perhaps students who go to college in another state are more likely to get homesick and do not have the family support so leave school at higher rates. Then we would expect this to also be the case for the Table 3 regression, but it is not.

There are other variables that were unavailable that I would have liked to include in the regressions, particularly the percentage of students in each school that are First-Generation. It is possible that the regressions do pick up on some of this. For example the Hispanic coefficient is negative and statistically significant for the four year graduation rate, but not for the six year. Schools with a higher percentage of Hispanic students, who are also likely to be First-Generation and have family obligations may graduate but in more years.

CONCLUSION

With fewer students attending colleges and universities every year, bureaucratic administrations growing and tuition rising it is more important than ever to pay close attention factors influencing costs and the value of higher education. The goal of this paper was to compare factors impacting schools reported six year graduation rate with the implied one of four years for prospective students. Results showed that there are some variables that impact four, but not six year graduation rates.

While this research is an important first step in comparing four and six year graduation rates, there are some significant limitations of this study. First is that it would be good to include more variables that likely contribute such as the different majors that are offered at each school, the percentage of First-generation Students and other differences between each institution.

While regression is a very important tool in isolating the impact of one variable on graduation rates, holding other variables constant, additional research should look at a more micro level. For example, it was shown that schools in Michigan and Wisconsin have lower four year graduation rates even holding dozens of variables constant. It would be helpful to determine exactly what some of the factors are and see if there are any policies that might help address the issues. Nonetheless, this is a good first step looking at why the reported six year graduation rate may not accurately mirror the anticipated four year one.

APPENDIX

This paper looks at institutions of higher education in the United States. These are colleges and universities that provide education after high school (post-secondary institutions). Officially a college is different from a university, often a college being part of a university. While these are not the same, I follow conventional custom and use the terms interchangeably.

This paper focuses on states in the Midwest. There are different definitions of the Midwestern United States based on geography. Some of these use locations such as states lying above the 37th parallel between the Appalachian and Rocky Mountains. Others use description of the land such as the Great Plains. The states in this analysis does not follow a specific definition but is a loose combination of various definitions.

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