

Out of Pocket Pay at Northwestern College

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Introduction/Hypotheses

The purpose of this study is to determine if there are any variables that have statistical significance when compared to family out of pocket pay or institutional aid. While the costs beyond student loans are a key factor for overall pay, the main concern of our study is to observe factors that affect the student shortly after graduating high school. We are observing the independent variables of major, Pell grants, and ACT scores, and how they affect the dependent variable of out of pocket pay.

We hypothesize that natural science majors are paying less money because they are receiving more aid from need based and academic based scholarships. In order to test financial based scholarships, we look at the Pell grant variable and see if natural science majors are receiving the Pell grant more often than other majors. As for academic based scholarships, we use high-school GPA and composite ACT scores to measure the academic ability of the students. We predict that natural science majors will have higher average ACT scores and GPAs than the other majors.

Method

The data we used for this study is provided by Northwestern College Department of Institutional Research. This data contains information about students who enrolled and graduated from Northwestern College. The data is collected from information about each student prior to attending Northwestern College, such as high school GPA, high school class rank and class size, and ACT math scores. The data also contains statistics involving academics while attending Northwestern, which includes GPAs for their first, second, and final years, as well as the number of credits they took each year.

We use Excel and R to run tests, regressions, and to create tables of our data. After running our regression models, we see that kinesiology and education majors are the only two majors that pay more money than students who come in undecided. However, the amount that they pay is not statistically significant, but it still has importance when looking at which majors “cost” the most money. The major that has the most significance in reducing the out-of-pocket money value is natural science with an average of paying \$2,484.44 less than our baseline of undecided at a 99% significance value.

Results

Table 1- Percentage of Each Major

1 st Semester Major	Meaning	Frequency	Percentage
EDU	Education	89	10.67
AHUM	Arts and Humanities	116	13.91
SSCI	Social Sciences	74	8.87
NSCI	Natural Sciences	175	20.98
BUS	Business	125	14.99
UND	Undecided	179	21.46
KIN	Kinesiology	77	9.23

Table 2- Pell Grant

	Students with Pell	Students in major	% Of students in major with Pell
EDU	23	89	25.8%
AHUM	40	116	34.5%
SSCI	18	74	24.3%
NSCI	38	175	21.7%
BUS	28	125	22.4%
UND	51	179	28.5%
KIN	18	77	23.4%

Table 3- ACT Scores

Major	Average Composite ACT	Average High School GPA
AHUM	25.48	3.61
BUS	24.94	3.61
EDU	23.90	3.59
KIN	24.05	3.57
NSCI	27.17	3.79
SSCI	24.54	3.61
UND	24.69	3.71

Conclusion

The data shows that the amount of money a student coming to Northwestern College pays can be predicted by their major. Natural science majors pay less money than the other majors pay to attend, due to their academic talent. The results of our regressions show that natural science majors do better on their ACTs and their overall high school GPAs, leading them to get higher academic scholarships.

Future Directions

When doing research with the data at hand, we were halted by the lack of information regarding a student’s major. With the data provided, we could only see the major that a student came to college with, not what they ended their career with. This made our hypothesis fickle, and we often questioned the usefulness of our research. Another regression that we would have liked to run used family income as a variable, which we didn't have access to since it was quite incomplete. There were too many blank data points within that category that we opted out of using it for fear of skewed results. A more complete set of data would allow a higher level of performance and confidence with the results of the regressions. If we were to look at this data again, we would have liked to change the precision of our “majors” category. We only had access to large categories of majors rather than individualized majors such as math, chemistry, *et cetera*. Being able to pinpoint which majors had the most significant changes in cost could be more beneficial to the school, rather than broad areas of majors.

Sources

Student Data from Northwestern College
RStudio