INFLUENCE OF NCAA ATHLETIC SUCCESS ON ANNUAL GIVING

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Abstract

Previous studies have attempted to draw conclusions on the impact athletic success has on annual giving. There has yet to be conclusive data on this topic. This study will attempt to build on previous research by including more athletic success variables in the model. This study includes data for football, men’s and women’s basketball at Division I and Division III institutions. A separate ordinary least squares regression model was used for each form of annual giving, which included alumni giving, board giving and athletic giving, to identify the determinants of each. The results found for each variable differs depending on the form of giving. Women’s athletic success had an influence on annual donations whereas men’s sports did not and this was the only consistent result across all models. Overall, the results indicate that athletic success does not seem to have a significant impact on annual donations.

KEYWORDS: (National Collegiate Athletic Association, Athletic Success, Annual Giving)
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CHAPTER I
INTRODUCTION

For higher education institutions there are important sources of funding that keep schools running and able to provide the services they need to. One subject that has grown increasingly popular is the study of annual donations. There are many aspects to consider when looking at annual donations. These can include the factors that affect the donation amount as well as the different forms of annual donations. This topic has grown in importance due to the decrease in donations seen during the economic downfall.\(^1\) Donations are expected to increase each year but after the economic decline, this result was not seen. Donations in 2010 only increased by 0.5%, but when adjusted for inflation, donations actually declined by 0.6%. This decline followed a decline of 11.9% in 2009.\(^2\) Alumni donations are extremely important to schools because a quarter of annual donations come from alumni gifts.\(^3\) Figure 1.1 provides a visual representation of the sources where annual donations


\(^2\) Ibid

\(^3\) Ibid
come from. The only form of donations that are larger than alumni donations is foundation donations.

Due to the decrease in donation amounts it is even more important for institutions to understand what may help them raise more donations. One topic researched is the influence of athletic success on annual donations. Previous research has explored some aspects of athletic success including football and men’s basketball teams at Division I institutions. Results from previous studies have not found consistent results on the effects athletic success has on annual donations. This study will attempt to build on previous studies and examine the determinants of alumni giving as a function of athletic success. In general most studies have concluded that there is no significant influence from team’s winning percentages. The types of variables used in this study will build on other studies and incorporate more variables to make the models more accurate. This study will also build on other studies by using both Division I and Division III institutions as well as both genders, rather than just using data on men’s teams.
By using the non-athletic variables it is hypothesized that graduation rate, ranking in the top 25, enrollment and endowment will all have positive influences on increasing donation amounts. It is also believed that total cost, being a public school and a higher student faculty ratio will cause donation amounts to drop. When considering athletic variables it is believed that the athletic success variables dealing with football and men’s basketball will not influence annual donation amounts. It is hypothesized though that women’s basketball will effect alumni donations in a positive manner. The results may also present an idea that the influences are different for Division I than for Division III.

This study will continue to build on previous studies and provide valuable results to higher education institutions. A theoretically model of utility maximization and a regression model will be utilized in order to frame and answer

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the question regarding alumni donations and athletic success. The paper will first look in depth at previous research and the results that have been found. Following the discussion of other studies, the theory behind the models used in the study will be explained and a utility function will be presented. Once the theory has been presented the data and models used throughout the study will be explained. Finally the results and conclusions found from the data will be presented and conclusions will be drawn from the study.
CHAPTER II
LITERATURE REVIEW

The objective of this chapter is to review the current literature on the correlation between annual giving, to institutions of higher education, and athletic success. Annual donations have always been an important source of revenue for higher education institutions and this chapter will discuss the different determinants of donations to NCAA schools. Alumni participation, through monetary donations is vital to the success and sustainability of an institution. Intercollegiate athletics have also become a vital part of many schools because of the ability to draw in more money and other students. Certain amateur sports in college have become comparable to professional sports and provide exciting entertainment for millions of people. The first section of this chapter will expand on determinants for annual donations. The next section will present the research on athletic success and the ways in which it affects institutions, such as donations and academic success. There is an abundance of research done on athletic success, but most studies focus only on football teams.

Annual Giving

Annual giving can come in many forms, most commonly alumni giving, and each donor is influenced by different factors. These factors can include a number of different
things such as student/faculty ratio, enrollment, tuition etc. There are many studies that have been done on the sources and influences of annual giving to higher education Institutions. Donations to schools can come from many different sources, such as alumni, parents, corporations, foundations and many other organizations. It is important to understand what influences donations so that universities can maximize their donations.

When looking at alumni giving to Stanford University, the school’s athletic director, Ted Leland stated: “When I go out to raise money for Stanford and talk to former athletes, I tend to hear things like, “I gave my knee to Stanford—that’s all your getting from me.”

It has been found that half of annual charitable donations to all universities are given to liberal arts colleges or private research universities. There are many determinants for the donations. Ehrenberg and Smith (2003) look at why donations given by each source varies over time. In their study they used panel data from 30 major private research institutions and 30 selective liberal arts schools. They found that the donations were higher when the ratio of CEO’s was larger than the size of the institutions student population. It was also found that giving per student is higher for top 25 institutions ranked by U.S. News and World. The study they performed showed that richer institutions receive higher donations from all sources. Gender and race also play an important role in donation amounts. A higher population of undergraduate female students correlated with lower alumni and corporate giving. On the other hand, when

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there was a greater share of underrepresented minority students, schools tended to receive
greater foundation donations, but lower levels of corporate and individual giving.⁶

In another study on annual giving, Wunnava and Lauze (2001) primarily explored
the motivations of donors to small, private liberal arts colleges. They looked at different
circumstances than the previous study. The results showed large increases in alumni
donations during reunion years, particularly during major reunion years, such as 10 and
20. Wunnava and Lauze also found that the growth rate of alumni donations remained
positive for consistent donors until the average age of that class reached sixty-one. The
study also showed that those alumni who volunteered as college students were more
likely to donate after graduation.⁷

Holmes (2009) explores further the determinants of charitable giving. Private
institutions were examined in the study and the results show that wealthier alumni who
live in states where they are able to receive charitable tax deductions tend to donate more
than those who cannot receive deductions. The study also shows that donations rise when
athletic prestige rises, but donations fall when academic prestige rises. It should be noted
that for athletic prestige the study uses the record of the institution’s hockey team. The
institution used was not reported in the study.⁸

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Selective Private Research Universities and Liberal Arts Colleges. *Economics of

⁷ Wunnava, Phanindra V. & Lauze, Michael A. (2001). Alumni giving at a Small Liberal
Arts College: Evidence from Consistent and Occasional Donors. *Economics of
Education Review*, 20, 533-543.

⁸ Holmes, Jessica. (2009). Prestige, charitable deductions and other determinants of
alumni giving: Evidence from a highly selective liberal arts college. *Economics of
A study by Clotfelter (2003) looks more at the personal experiences that link donors to the institutions that they donate to. They found donations to be highly correlated to measures of satisfaction with the school. The satisfaction was related to measures including whether the person attended a public high school, whether the college had been their first choice, and whether someone took a special interest in them when he or she was enrolled there. The study also found that alumni from liberal arts colleges tended to give more than those from universities. Also, if students had received need-based aid, they tended to give less, and those who were related to former alumni tended to give more. This study has helped to explain some of the unmeasured wealth circumstances that affect alumni giving.9

There are many factors that can affect annual giving, but there are also factors that have been found not to impact giving. Cunningham and Cochi-Ficano (2002) found that soliciting efforts, the profile of sports on campus and religious affiliation had no statistically significant effect upon annual donations.10

**Athletic Success**

The impact of athletic success is becoming a popular topic amongst economists. McCormick and Tinsley (1987) found that athletic success was important for universities

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because it could be used a marketing tool to attract students. With higher athletic success universities were able to attract students that had higher SAT scores.\textsuperscript{11}

Institutions emphasize athletic success due to the belief that it will increase annual donations. Results from previous studies have yet to consistently support this idea. One problem that arises in these studies is the question of how to define athletic success. There have been many studies performed on the athletic success of college sports teams. Most of these studies focus primarily on football teams. Cohen, Whisenant and Walsh (2011) examined a premier football team for a 25-year period. The team’s athletic success was judged by the team’s winning percentage. It was found that the winning percentage had no influence on the donation amounts.\textsuperscript{12}

It is important to understand not only how certain sports effect alumni donation, but also the difference in gender and athletics. Using a micro data sample, Meer and Rosen (2009) looked at many different factors of athletic success. The gender of the sports teams are considered as well as the winning percentages for the football, men’s and women’s basketball teams from one selective university. They found that the winning percentage of both football and basketball had little significance. It was found that gender did play a role. When a men’s former team was successful their donations were higher, but this was not the case for women. The results they found are important


but may not apply to all universities.\textsuperscript{13} Looking at a more in depth study, Baade and Sundberg (1996) used a much larger pool of data. Three hundred institutions were studied and winning percentages were seen to have very little effect on alumni donations. The study did show a positive effect on general giving from bowl appearances and NCAA appearances however.\textsuperscript{14} Shulman and Bowen (2001) found that alumni who were on winning teams were not likely to donate, but in fact athletes who were on losing teams were actually more likely to give back to support the athletics. They also found that win-loss records had no effect on general giving at the Division I level, but there was a positive effect at the Division III level at coed liberal arts schools. Division I sports had a negative impact, if anything on giving. This is a surprising result due to the fact that Division I is the highest, most competitive level.\textsuperscript{15}

Other studies have found results that continue to build on the idea that athletic success increases annual donations. For example, Brooker and Klastorin (1981) looked at 58 institutions that participated in major athletic conferences and found a positive relationship between the football team’s winning percentage, bowl appearances and percentage of alumni donors. Rhoads and Gerking (2000) examined NCAA Division I football and basketball teams from 87 universities. Their study displayed a positive


Athletic success can affect other factors of alumni donations indirectly. Graduation rates have been found to increase donations for universities. Rishe (2003) looks at athletic success on graduation rates. A least squared estimation and paired t-tests from Division I schools were used to find that athletic success did not play a roll in influencing graduation rates. However, findings varied by gender. When focusing on student-athletes, women had a higher graduation rate than men.\footnote{Rishe, P. J. (2003). A Reexamination of How Athletic Success Impacts Graduation Rates: Comparing Student-Athletes to All Other Undergraduates. \textit{American Journal of Economics and Sociology}, 62, 407-427.} Stinson and Howard (2008) explored patterns of athletic success and private giving. This study differed from previous studies in the fact that it included different divisions. Using linear mixed models in their study it was apparent, at the Division I-AA and I-AAA level, that higher athletic success affected the number of donors and the donation amount to the school. The study also showed that when a school has greater success it creates more support for not only the athletic programs, but the academic programs as well.\footnote{Stinson, J. L. & Howard, D. R. (2008). Winning Does Matter: Patterns in Private Giving to Athletic and Academic Programs at NCAA Division I-AA and Division I-AAA Institutions. \textit{Sport Management Review}, 11, 1-20.} Mixon (1993) looked at the effect of athletic success on higher education. In the study the focus was on basketball teams and data was pulled from the NCAA. It was found that athletics had a positive
effect in building the higher education mission at universities through attracting valuable students.  

**Conclusion**

This working study will work to bring together aspects of annual giving and athletic success. Many of the previous studies discussed look at important parts of alumni giving as well as different effects athletic success can have on higher education institutions. There has not been a study yet that combines many different aspects of athletic success, comparison across multiple division levels, multiple sports, both genders as well as multiple donation types. This study will build a model to predict athletic success’ effect on annual donations.

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CHAPTER III
THEORY

Education is a very important part of society in America. Many students make the choice to pursue higher education after completing high school. This is a choice that is made available partly by alumni donations. Universities seek to receive the maximum amount of alumni donations possible each year. These donations are important to the institutions for many reasons. Donations can represent education quality, school credibility, the number of scholarships available, and can also help cover some education costs. For this reason higher education can offer their service at a premium.\(^{20}\) Based on the significant influence donations have, it is important to understand why donors make the choices they do. This chapter will offer a visual guide to display some of the causes of alumni giving dealing with athletics as well as non-athletic donations (FIGURE 3.1). The next section will then provide a utility maximization model. This model will display the utility of donors as a function of giving and all other factors. This will also lead to the development of a demand function. This chapter will then continue by exploring the different determinants of alumni giving.

These factors will be discussed in further detail later in the chapter.
Utility Maximization

When studying different topics, economists like to look at the total utility generated by an individual’s consumption bundle, and the utility function allows us to do this.\textsuperscript{22} When analyzing the consumer’s behavior, it is assumed that every consumer is trying to maximize his or her utility; this is where the utility maximization function becomes important. This theory can be applied to the study of alumni giving.\textsuperscript{23} In the case of alumnus, we are considering their level of happiness with donating. Each alumnus who donates has a different utility function. Figure 3.12 represents the utility function in an altered form to fit the needs of this study.

\begin{equation}
U (G, Y) \tag{3.2}
\end{equation}

In this function, \( U \) represents their total utility with \( G \) and \( Y \) representing giving and composite numeric good (i.e. all other goods). When maximizing utility, the budget constraint must also be considered. This leads each alumnus to his specific budget constraint, represented in Figure 3.13.

\begin{equation}
I = P_G G + P_Y Y \tag{3.3}
\end{equation}

Within the budget constraint \( I \) represents the income that the alumnus has available for consumption. \( P_G \) represents the price of all other goods, while \( G \) represents the amount of

\textsuperscript{22} Krugman, Paul & Wells, Robin. *Microeconomics*, 2009.

\textsuperscript{23} The utility function will help provide a function to measure the physical value of money and the perceived value of money.
these goods purchased. $P_Y$ in the budget constraint displays the price of giving, while $Y$ shows the amount of giving they participate in. The corresponding Lagrangian is:

$$\mathcal{L} = G^\alpha Y^\beta + \lambda(I - gP_g - yPy)$$  \hspace{1cm} (3.4)$$

In the above function utility, $U$, is a function of giving, $G$, and all other things, $Y$. Income of the donor is represented by $I$, and $P_G$ and $P_Y$ represent the price of giving and the price of all other things respectively. $P_G$ represents the amount they give up for all other goods by choosing to donate. Once this initial function, figure 3.14, has been developed there are numerous steps that must be followed to reach utility maximization. The steps are as follows:

1) The Lagrangian function is based on the utility function and budget constraint presented. 2) The first-order conditions must be found with respect to $G$, $Y$, and $\lambda$. 3) Then to find the optimal amounts of $G$ and $Y$ the first-order conditions are set equal to zero and solved.

The first step has been completed in Figure 3.14 so step two must now be completed. Using partial derivatives with respect to $G$, $Y$ and $\lambda$ the following equations are found:

$$\frac{\partial \mathcal{L}}{\partial G} = \alpha G^{\alpha - 1} Y^\beta - \lambda P_G = 0$$  \hspace{1cm} (3.5)$$

---

$^{24}$ First order conditions are found by taking the partial derivative from the Lagrangian function.

\[
\frac{\partial L}{\partial Y} = \beta G^2 Y^{\beta - 1} - \lambda P_Y = 0 \quad (3.6)
\]

\[
\frac{\partial L}{\partial \lambda} = I - GP_G - YP_Y = 0 \quad (3.7)
\]

Once finding the partial derivatives, the next step to calculate optimal amounts is to divide equation 3.15 by 3.16 and then the following equation is arrived at:

\[
\frac{\alpha Y}{\beta G} = \frac{P_G}{P_Y} \quad (3.8)
\]

This now provides an equation in which each variable can be isolated to find the optimal amount to reach maximum utility, or happiness as a donor. Through isolation and substitution the optimal amounts of alumni giving and all other spending can be found:

\[
G = \left( \frac{\alpha}{\alpha + \beta} \right) \frac{I}{P_G} \quad (3.9)
\]

\[
Y = \left( \frac{\beta}{\alpha + \beta} \right) \frac{I}{P_Y} \quad (3.10)
\]

Through the Lagrangian multiplier method, the optimal amount of both variables included, are found. These equations supply demand equations in order to maximize the utility of the agent from each variable. Each alumnus will attempt to reach their
maximum level of satisfaction limited by the constraints they are subject to. These model theories presented above are the best representation because they take into account all spending by the alumnus while still regarding their budget constraint.

Building on this theory presented, this chapter will now look deeper into each determinant. Explanations are provided first for non-athletic determinants, (NAD), followed by athletic determinants, (AD).

**Non-Athletic Influences on Annual Donations**

This section will explore the non-athletic causes for alumni donations. This has been an area with much greater research done than that on the athletic influences. There are many different determinants and they may seem more applicable to alumni giving than the athletic determinants.

**Age**

The age of donors can play an impact on donations. This is also known as the life-cycle effect. Using a theory by Wunnava and Lauze (2001) the growth rate of alumni donations is predicted, using equation 3.14.

\[
\delta \text{LNRGIVE}/\delta \text{AGE}=0
\]  

(3.11)

The results showed that growth rate for alumni donations remains positive until the class age reaches 61 years. If it is assumed that alumnus are 21 on average when they graduate, this means donations will remain positive until he/she is 82 years old.26

**Student Quality**

Many different measures are used to determine student quality. A specific measurement of this is the FroshTop10. This is used as a measurement of the fraction of the freshman student body that graduate in the top 10 percent of their high school class. In addition, SATTot is used as another determinant of student quality. SATTot is a mean value for total SAT scores. In theory, and keeping with Cunningham and Cochi-Ficano (2002) when there are higher levels of student quality, based on SAT scores and high school class rank, this correlates to a positive increase in alumni donations.\(^{27}\) This is most likely due to the fact that higher student quality correlates with alumni holding higher paying job positions. This in turn allows them to donate larger amounts.

**Institutional Value**

Much like student quality, institutional value can be measured by multiple variables. Student-Faculty Ratio is one determinate of the value. Data on this is readily available and is used in this study. This measures the ability of the institution to add value to their students. Enrollment is also a factor in the institutions value. When schools have a larger enrollment this means they need more money, and hence more alumni donations. Based on this reasoning, in theory the higher enrollment, the larger amount of alumni donations expected. Cunningham and Cochi-Ficano support both of these theories (2002). They first find that alumnus donations increase by between $17 and $33 for every standard deviation increase in the student faculty ratio. They then went on to find that

enrollment positively increase alumni donations.\textsuperscript{28} There is evidence that both theories can be a crucial part of alumni donation based on the institution’s perceived value. Tuition is also a factor that could be considered part of the institutional value. When tuition for a school is higher this usually represents that the institution has more to offer for the student. Currently there are no studies on this idea, but theory would suggest that alumni donations are greater when tuition is higher.

**Public vs. Private Institutions**

When looking at higher education institutions it is also important to take into account the different types of schools, such as private and public schools. Private schools are those that are independent from the state or national governments. Due to the fact that private schools receive no government funding, my theory would suggest that alumni donations are greater for private schools than public schools. Public schools still rely on alumni donations, just not as much as private schools because they are able to receive funding from local and federal taxes in addition. It has been found that half of annual charitable donations are given to liberal arts and private institutions.\textsuperscript{29}

**Charitable Tax Deductions**

When alumni consider the idea of giving, one thing that makes the act seem more appealing is charitable tax deductions. Certain states allow charitable subsidies. When


alumni live in states where this is available they will feel as if they are getting something back from their donation. Using this idea, theory would present that where these subsidies are present, alumni donations would be greater than alumni who live in states where subsidies are not available. Holmes (2009) remains consistent with this theory in finding that alumni donations were higher for individuals who were able to receive deductions than those who couldn’t receive the deduction.30

**Athletic Influences on Annual Donations**

Athletic influences on alumni donation will now be discussed. Some ideas presented in this section may seem harder to relate to alumni giving than the non-athletic factors. Theories and expected signs will be presented for each variable. Some theories presented that have not previously been studied and need further research.

**Winning Percentage**

Athletic success of a team or institution is a difficult thing to measure. One way that is commonly used to measure success, is winning percentage. The winning percentage is represented as the number of games won divided by the total number of games played. Some theories stand to argue that as teams win more games this causes alumni to donate more.31 It is believed that alumni feel more excited and have more school pride when their alma mater does better. McCormick and Tinsley (1987) demonstrate that athletic success is important for universities because it is used as a marketing tool to attract students. With higher athletic success, schools appeal to better

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students.\textsuperscript{32} Other theories such as Cohen, Whisenant and Walsh (2011) found that winning percentage had no effect on alumni donation amounts.\textsuperscript{33} This is obviously an area of conflict.

**NCAA Tournament or Bowl Bid**

When competing collegiately there are many ways to measure success. One of the most prestigious ways to measure is by postseason play. Depending on the sport you play there are different forms in which you can compete in the postseason. For football teams having a successful season usually means you receive an invitation to a bowl game. There are many different bowl games, but they are all a very anticipated part of the season. For basketball teams a successful season means an invitation to the NCAA tournament. The NCAA tournament draws a large amount of attention to the 64 teams competing. Based on the amount of publicity and excitement around both of the events it is assumed in theory that alumni donations increase when teams make it to the postseason, and even more so if the team wins the championship. Baade and Sundberg (1996) find results in agreement with this theory, in that there was an increase in donations when there was a postseason appearance.\textsuperscript{34}


Gender of Sports Team

When looking at sports teams it is easy to consider all teams in the same category, but it is important to differentiate between male and female teams when considering alumni donations. The gender of a team can have different impacts on alumni. One theory, as stated before, determined that if a men’s team performed better in college their donations were higher than their female counterparts.\textsuperscript{35} It may be possible that the gender of different sports teams can create different amounts of publicity and this can affect donation amounts. There are no studies presenting the difference between men’s teams athletic success compared to women’s and the effect on alumni giving.

Level of Competition

Universities compete over a wide range of levels. Depending on the division the school competes at, this can determine the quality of athlete they are able to attract. This also influences the amount of money available for athletic scholarships, publicity and a number of other things. There are a limited number of theories on this concept. One theory states that when looking at Division I-AA and Division I-AA School’s higher athletic success leads to higher amounts of donations than Division I-A schools.\textsuperscript{36} Another theory looks at Division I schools in comparison to Division III studies. It was found that donations were actually higher for Division III schools than it was for those


competing at the Division I level.\textsuperscript{37} This theory is a bit harder to understand and must be explored further.

After presenting the theories and the variables that influence annual donations, it is easier to understand how the utility function presented earlier could be modified. Figure 3.12 represents utility for giving as a function of non-athletic determinants and athletic determinants.

\[ G = F [\text{NAD, AD}] \]  \hspace{1cm} 3.12

Figure 3.13 and 3.14 continue to break down the utility function by explaining NAD and AD as their own functions of the variables included in this study.

\[ \text{NAD} = G [\text{Age, Student Quality, Public School, Tax Deductions, Inst. Value}] \]  \hspace{1cm} 3.13

\[ \text{AD} = H [\text{Win \%, Gender, Level, NCAA, Bowl Games}] \]  \hspace{1cm} 3.14

With modified utility functions it is now possible to begin looking at the question of how these variables affect annual giving.

\textbf{Conclusion}

In this chapter there are many theories and models presented and discussed. This is all valuable information when working to understand the theory of the model that is used

further in this study. Both athletic and non-athletic sections present many different factors, and all are important. This study uses many of these factors in the regression model. Non-Athletic factors that will be used in the regression include FroshTop10, SATTot, Student-Faculty Ratio, enrollment, tuition and type of school. Athletic factors included in the regression model are team’s winning percentage, postseason appearances, gender of team and division at which the school competes. These expectations are tested in the next chapter.
CHAPTER IV
DATA AND METHODS

This chapter will examine the data set that has been assembled in order to test the model presented in the previous chapter. The previous chapter discussed the theoretical components of the model. This chapter provides descriptions of the variables that were used to present the components of the regression models. The chapter begins by discussing the dependent variable, annual giving. This will be followed by a discussion of academic determinants of giving as well as a discussion of athletic determinants. The chapter concludes by describing the methodology for testing the model.

Data Set

The panel data set used in these models consists of information from both Division I and Division III Universities. Division I data was taken from one hundred universities from 2000-2011. Data was taken from one hundred Division III schools from 2000-2011. For each school the data includes information on academic variables as well as athletic variables. Table 4.1 provides a complete list and short descriptions of all variables included in the model. The regression differs dependent upon the form of annual giving used in the model. For both Division I and Division III three separate regressions were run. Figure 4.1 provides the model for these three regressions.
TABLE 4.1

VARIABLE EXPLANATIONS

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Predicted Sign*</th>
</tr>
</thead>
<tbody>
<tr>
<td>TotAlumGiving</td>
<td>Total giving to institution from alumni</td>
<td>N/a</td>
</tr>
<tr>
<td>BoardGiving</td>
<td>Total giving to institution from board members</td>
<td>N/a</td>
</tr>
<tr>
<td>AthleticGiving</td>
<td>Total giving to institution's athletic departments</td>
<td>N/a</td>
</tr>
<tr>
<td>GRADRATE</td>
<td>Graduation Rate for that year</td>
<td>+</td>
</tr>
<tr>
<td>TOTCOST</td>
<td>Total cost to attend that institution</td>
<td>+</td>
</tr>
<tr>
<td>PUBLIC</td>
<td>Dummy Variable for public school</td>
<td>-</td>
</tr>
<tr>
<td>FROSH25</td>
<td>Ranking of the institution</td>
<td>+</td>
</tr>
<tr>
<td>SFRATIO</td>
<td>Student: Faculty Ratio</td>
<td>-</td>
</tr>
<tr>
<td>ENROLL</td>
<td>Enrollment for that institution</td>
<td>+</td>
</tr>
<tr>
<td>ENDOW</td>
<td>Endowment for institution</td>
<td>+</td>
</tr>
<tr>
<td>NCAABID</td>
<td>Dummy Variable for NCAA Basketball Tournament</td>
<td>+</td>
</tr>
<tr>
<td>HOOPCHP</td>
<td>Dummy Variable for Basketball National Champion</td>
<td>+</td>
</tr>
<tr>
<td>FOOTPCT</td>
<td>Winning percentage for institution's football team</td>
<td>+</td>
</tr>
<tr>
<td>HOOPSPCT</td>
<td>Winning percentage for institution's basketball team</td>
<td>+</td>
</tr>
<tr>
<td>BOWLBID</td>
<td>Dummy Variable for Football Bowl Bid</td>
<td>+</td>
</tr>
<tr>
<td>BOWLWIN</td>
<td>Dummy Variable for winning a Football Bowl Game</td>
<td>+</td>
</tr>
</tbody>
</table>

* Predicted sign represents the effect this variable will have on giving as it increases, or if it occurs in the case with dummy variables.

FIGURE 4.1

EMPERICAL MODEL FOR ANNUAL GIVING

TotAlumGiving = f (GRADRATE, TOTCOST, PUBLIC, FROSH25, SFRATIO, ENROLL, ENDOW, NCAABID, HOOPCHP, FOOTPCT, HOOPSPCT, BOWLBID, BOWLWIN)

BoardGiving = f (GRADRATE, TOTCOST, PUBLIC, FROSH25, SFRATIO, ENROLL, ENDOW, NCAABID, HOOPCHP, FOOTPCT, HOOPSPCT, BOWLBID, BOWLWIN)

AthleticGiving = f (GRADRATE, TOTCOST, PUBLIC, FROSH25, SFRATIO, ENROLL, ENDOW, NCAABID, HOOPCHP, FOOTPCT, HOOPSPCT, BOWLBID, BOWLWIN)
**Dependent Variable**

In the model described previously, the dependent variable is annual giving. There are three forms of annual giving that are studied in this paper. Total Alumni Giving was examined first. This variable represents the annual amount that all alumni donate back to each institution. Next, Board Giving was examined. This variable represents all annual donations to the institution from board members. The final form of annual giving tested, Athletic Giving, depicts annual giving to the institution’s athletic programs. All types of giving are measured in U.S. dollars.

This study tests the effects of athletic success variables on different forms of annual giving. This helps to determine whether or not the presence of an athletic team increases the annual giving to a given university.

**Academic Variables**

This study includes many academic variables. All of these variables will be explained further throughout the chapter. All academic variables were pulled from previous studies.

**Graduation Rate**

Graduation rates can significantly effect alumni donations. The more graduates a school has, the larger pool of alumni there are to receive donations from. The graduation rate of each individual institution is explored as one explanatory variable for annual giving. The graduation rate is defined as the percentage of students who graduated within the specific time interval.
**Total Cost**

The total tuition for a student to attend an institution varies from school to school dependent upon a number of factors. The cost may reflect the caliber of the school, but can also be affected by annual giving. If the institution receives significant funding from alumni the cost of tuition may decrease. Conversely, the cost of tuition may affect the likelihood that alumni will donate to an institution. The effect of the total cost on annual giving will be further explored in this study.

**Public**

The public variable used in this study is a dummy variable. This is used to show if the institutions are a public or private institution. The type of school can have an impact on the amount of annual giving. Alumni from private schools may feel a different connection to their schools than those from private schools.

**Top 25 Rankings**

The model also accounts for the variation in giving dependent upon an institution's national ranking. This variable will list the position the school is ranked nationally. This is purely a quantitative ranking of the school; the lower the number (closer to one) the better the school. This data is based off of the *World & News* rankings. Hypothetically, a school's ranking will directly correlate with its annual donations.
**Student-Faculty Ratio**

The student-faculty ratio can be defined as the number of students at the institution in comparison to the number of the faculty there. Some alumni see more of a personal connection to their alma mater if they were part of a school with a smaller student to faculty ratio. The smaller the ratio the more personal instruction students are able to receive from their instructor. This may also lead to a higher level of achievement from students and a greater likelihood that they will donate back to the school as alumni. It is expected that lower student-faculty ratios will result in greater alumni donations.

**Enrollment**

The enrollment variable in this study represents the number of students enrolled during each year being studied. The enrollment changes each year and is quite different across all schools. The schools admissions department determines the school's enrollment each year. It is assumed that when enrollment is higher at the institution, donations are also higher. This study will further examine this phenomenon.

**Endowment.**

The model incorporates the endowment given to an institution. An endowment consists of funds or property that have been donated to the institution. This can be an important factor in annual giving. When endowment is greater the institution tends to be more successful. When an institution is successful donors are
more likely to invest in it. It is thus expected that a school with a greater endowment will also receive more annual donations.

**Athletic Variables**

Success of an institution’s athletic department can be measured in many different forms. This study will use five different variables to test the impact of athletic success upon annual giving.

**Winning Percentage**

Winning percentage is included in this study as one of the athletic success variables. There are three sports teams included in the study at both divisions. Men’s football, men’s basketball and women’s basketball are included for each institution in this study. The winning percentage for each team was found on NCAA.org\(^{38}\) for each year that was included in the study. Annual winning percentages can be calculated by dividing the number of games won by the total number of games played. Each team may play a different number of games, so using the winning percentage is a way to study each team equally. The higher winning percentage should draw more interest in the institution.

**Bowl Bid**

Bowl bids are a dummy variable used to measure athletic success of football

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teams in this study. Bowl games are prestigious events that take place at the ends of collegiate football seasons. These games take place during the post season and teams are invited based on their in season records. In order for a team to be eligible for a bowl bid it must have won at least six games and it cannot have a losing record. Bowl games can be very important to institutions because they provide the opportunity for institutions to achieve recognition. This in turn can increase revenue and open up the chance to draw the attention of potential recruits. Information on bowl bids for each year was found at NCAA.org.\textsuperscript{39} It is expected that when an institution’s football team receives a bowl bid, annual donations will increase.

**Bowl Win**

Bowl win statistics function as a secondary dummy variable to bowl bid statistics. This variable represents football teams that won a bowl game. If the team was not invited to a bowl game they obviously cannot win a bowl game. Bowl game wins have an even greater effect on annual donations than bowl bids. If the team wins a bowl game it draws more attention to that institution as an athletically prestigious school. It also builds more positive media around that program. The more bowl wins a program has the higher annual donations should be.

**NCAA Bid**

The NCAA Bid variable deals only with men and women’s basketball. This is

\textsuperscript{39} Ibid
also a dummy variable that represents those teams who received a bid to the NCAA tournament. The NCAA tournament is a single elimination post-season event that 68 teams receive a bid to. For Division I schools especially this has become a highly regarded event nationally and has become one of the most prominent sporting events annually. Teams participating in this tournament have the hopes of becoming the national champion. There are two different ways teams may get a bid into the tournament. If a team wins its conference it will get an automatic bid. The NCAA selection committee also chooses the other thirty-seven teams based on in-season results. Receiving an NCAA bid can be very important to institutions due to the large interest in this event. Institutions competing in the tournament receive extra airtime when games are televised.

**NCAA Champion**

The final athletic variable included in the model accounts for NCAA championship wins, which functioned as yet another dummy variable. Teams can only win the national championship if they received a NCAA tournament bid. Winning the national championship can be very significant for an institution and its athletic programs. Donors will be more interested in institutions that are successful and championship wins are the ultimate indicator of success for collegiate basketball teams. The more national championships an institution has the more donations should increase.
Methodology

To begin looking at the effect of athletic success on annual giving, the data was first regressed. Each of the models presented earlier in this chapter was run as an OLS. This allowed for endogenous variables to be used without correlation. After completing the OLS, they were run as fixed effects and random effects models. Once the models were run in these two forms a Hausman Test was performed. The results produced by the Hausman Test suggested that fixed effects model should be used to produce the most accurate results. Additionally, a Ramsey RESET test was performed. This test was used to determine the significance of the non-linear variables used in the model. Results from the RESET test showed that the dummy variables used were indeed necessary and should be included in the model. As a final step, the models were tested for heteroskedasticity. The models for total alumni giving and board giving show no signs of heteroskedasticity, but athletic giving does. To correct for this, the model was run for robust errors.

Using these methods for all models included in the study, a number of inconsistent results were produced. These results differed depending on the model used and the athletic division (I or III) being studied. The following chapter will present the results of the regression analyses. Conclusions will be drawn from the presented results in Chapter V.
CHAPTER V
RESULTS AND CONCLUSIONS

The final chapter will present the results that were produced from the multiple regressions in the study. Two separate studies were done in order to generate results. All results were generated using Ordinary Least Squares (OLS). Both regressions produced different results based on the variables that were included. One model represents Division I data and the second model represents Division III data. Both of the models will look at total alumni giving. Board giving and athletic giving were also studied but did not yield significant results. These results can be found in the appendix. All models included the same variables: graduate rate, total cost, public school (dummy), top twenty-five ranking, student faculty ratio, enrollment, log (endowment) NCAA bid (men's and women's), NCAA Champion (men's and women's) football winning percentage, basketball winning percentage, bowl bid and bowl win. The variables that were in the form of dollars were converted into log form for this study. These variables included endowment, annual giving, and total cost. Throughout this chapter each of the model results are further explored. After discussing the results from the models, this chapter will discuss the problems or limitations that this study presented. Conclusions will then be drawn based on the results found.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Model I Coefficients (T-stats)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRADRATE**.</td>
<td>Graduation Rate</td>
<td>0.0174 (3.41)</td>
</tr>
<tr>
<td>TOTCOST**</td>
<td>Total Cost to attend</td>
<td>-0.0000178 (-3.14)</td>
</tr>
<tr>
<td>PUBLIC</td>
<td>Dummy variable for Public Schools</td>
<td>-0.207 (-1.22)</td>
</tr>
<tr>
<td>FROSHTOP25**</td>
<td>Top 25 World Ranking</td>
<td>-0.00757 (-2.37)</td>
</tr>
<tr>
<td>SFRATIO**</td>
<td>Student to faculty ratio</td>
<td>0.000419 (4.70)</td>
</tr>
<tr>
<td>ENROLL</td>
<td>Total enrollment</td>
<td>3.59e-06 (1.33)</td>
</tr>
<tr>
<td>ENDOW**</td>
<td>Log (Endowment)</td>
<td>0.605 (14.10)</td>
</tr>
<tr>
<td>NCAABID</td>
<td>Dummy variable bid to NCAA tourney men's basketball</td>
<td>0.0572 (0.56)</td>
</tr>
<tr>
<td>NCAACHMP</td>
<td>Dummy variable winning NCAA tourney men's basketball</td>
<td>-0.184 (-1.29)</td>
</tr>
<tr>
<td>FOOTBALL%</td>
<td>Winning percentage football</td>
<td>-0.000722 (-0.40)</td>
</tr>
<tr>
<td>BBALL%</td>
<td>Winning percentage men's basketball</td>
<td>-0.00210 (-0.58)</td>
</tr>
<tr>
<td>BOWLBID</td>
<td>Dummy variable bid to a bowl game</td>
<td>0.0399 (0.47)</td>
</tr>
<tr>
<td>BOWLWIN</td>
<td>Dummy Variable winning bowl game</td>
<td>0.0820 (0.97)</td>
</tr>
<tr>
<td>BBALL%W**</td>
<td>Winning percentage women's basketball</td>
<td>0.575 (2.21)</td>
</tr>
<tr>
<td>NCAABIDW</td>
<td>Dummy variable bid to NCAA tourney women's basketball</td>
<td>-0.0611 (-0.79)</td>
</tr>
<tr>
<td>NCAACHMPW*</td>
<td>Dummy variable winning NCAA tourney women's</td>
<td>-0.372 (-2.70)</td>
</tr>
</tbody>
</table>

* Represents variables found to be significant with a p-value < 0.1
** Represents variables found to be significant with a p-value < .05
TABLE 5.2
FIT OF MODEL I RESULTS

<table>
<thead>
<tr>
<th>N</th>
<th>R-Squared</th>
<th>Adjusted R-Squared</th>
<th>F-Statistic</th>
<th>Constant</th>
</tr>
</thead>
<tbody>
<tr>
<td>264</td>
<td>0.6429</td>
<td>0.6198</td>
<td>27.80</td>
<td>4.045291</td>
</tr>
</tbody>
</table>

**Model I Total Annual Giving - Division I**

The determinants of total alumni giving for Division I institutions are explored through Model I. Table 5.1 provides a visual representation of the results produced by the OLS of Model I. Coefficients and t-statistics are shown in the table for each of the variables used. Table 5.2 provides other valuable information produced by the OLS. The R-squared coefficient is important to determining how well the regression fits the model. This value represents the percent variation of the dependent variable around its mean that is explained by the model. In this model the dependent variable is represented by total alumni donations. In this model the R-squared value is equal to 0.6429. This value means the model represents 64% of the variation with the included independent variables.

The F-Statistic is another measure that can be important when trying to determine the fit of the model. The F-Test shows if the independent variables, taken as a group, explain the dependent variable. The calculated F-Stat of 27.80, in Model I, exceeds the critical value of 2.06, required for significance at a one percent level.

**Results**

Model I was used to determine what variables affect total alumni giving at Division I Institutions. The total alumni’s giving is represented as a percent. The first
variables included are the academic (non-athletic) variables. The academic variables that are found to be significant in this study include graduation rate, total cost, student-faculty ratio and endowment. Graduation rate, endowment and student faculty ratio all yield positive coefficients. It makes sense that as graduation rate increases this would cause alumni donations to also increase. As more students graduate, this allows for a larger pool of alumni to for the institution to pull donations from. Student-faculty ratio is an interesting variable because it would be expected that a smaller student faculty ratio would increase donations, but results produced in this study show differently. The larger the class size, the larger the donations are. An institution’s endowment results in a positive increase of alumni donations. This result could be due in part to the idea that individuals want to put their money into places they know are successful, and endowment can be representative of this success. Results for the institution’s total cost and its top twenty-five ranking were not consistent with this idea as they both had negative effects on alumni giving. If an institution had a higher cost or a higher ranking it resulted in a decrease of alumni donations.

This study focuses on determining the effect of athletic success on annual donations. In Model I, the winning percentage and winning a national championship, both for women’s basketball, were the only athletic variables found to be significant. Both variables had a positive impact on alumni donations. If a women’s basketball team increased its winning percentage by 1%, alumni donations would increase by 4.62%. When the women’s basketball team won a national championship, alumni
donations increase by 3.67%. There are no variables found to be significant for men’s sports.

**Model I Econometric Issues**

Several econometric problems had the possibility of arising while running the regressions in this model. Heteroskedasticity can occur when constant variance is not found throughout the model. After running the regression, the White Test is used to determine if heteroskedasticity presents a problem. Based on the results produced by White Test, the null hypothesis is rejected and it is therefore determined that heteroskedasticity is a problem. To correct for this, the regression was run again for robust errors and the results from this are used as the results presented as the final results.

Another issue that can arise is when the model is miss-specified. To determine if this is a problem a Ramsey's RESET test is run. The critical F value for this model at the 1% level of significance is 3.86. After completing the RESET test the F-value found is 2.66. This value is lower than the critical value, so it is assumed that the model is not miss-specified. It can be assumed then that the dummy variables used in this model are necessary.

**Model II Total Annual Giving – Division III**

In this study, Model II looks at the different determinants of total alumni giving at Division III Institutions. The independent variables used in Model II are very similar to those in Model I, but they vary slightly. All of the academic variables from Model I remain the same; the difference of variables occurs within the athletic success variables. Due to the time constraints of this study, the variables for athletic
success only include the winning percentage for football, men’s basketball and women’s basketball. Table 5.3 displays the results from the OLS model for all of the variables used. Table 5.4 depicts the fit of the model results from the OLS model.

TABLE 5.3
OLS MODEL II ANNUAL GIVING
DIVISION III

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Model II Coefficients (T-stats)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRADRATE**</td>
<td>Graduation Rate</td>
<td>0.0121036 (3.11)</td>
</tr>
<tr>
<td>TOTCOST</td>
<td>Total Cost to attend</td>
<td>-6.52e-07 (-0.21)</td>
</tr>
<tr>
<td>PUBLIC**</td>
<td>Dummy variable for Public Schools</td>
<td>-1.601066 (-9.23)</td>
</tr>
<tr>
<td>FROSHTOP25*</td>
<td>Top 25 World Ranking</td>
<td>0.005216 (1.77)</td>
</tr>
<tr>
<td>SFRATIO**</td>
<td>Student to faculty ratio</td>
<td>0.0035867 (2.05)</td>
</tr>
<tr>
<td>ENROLL**</td>
<td>Total enrollment</td>
<td>0.0001903 (4.26)</td>
</tr>
<tr>
<td>ENDOW**</td>
<td>Log (Endowment)</td>
<td>0.4235394 (8.64)</td>
</tr>
<tr>
<td>FOOTBALL%</td>
<td>Winning percentage football</td>
<td>0.0275046 (0.24)</td>
</tr>
<tr>
<td>BBALL%</td>
<td>Winning percentage men’s basketball</td>
<td>0.154799 (1.15)</td>
</tr>
<tr>
<td>BBALL%W*</td>
<td>Winning percentage women’s basketball</td>
<td>0.169855 (1.39)</td>
</tr>
</tbody>
</table>

* Represents variables found to be significant with a p-value < 0.1
** Represents variables found to be significant with a p-value < 0.05
TABLE 5.4

FIT OF MODEL II RESULTS

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>R-Squared</th>
<th>Adjusted R-Squared</th>
<th>F-Statistic</th>
<th>Constant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>634</td>
<td>0.5478</td>
<td>0.5406</td>
<td>75.48</td>
<td>5.475942</td>
</tr>
</tbody>
</table>

Model II (Division III) yields results that are similar to Model I (Division I), but there are also results that vary. In this model, the R-Squared value is found to be 0.5478, or 55%. This is value is smaller than that of Model I, but this is expected because there are not as many athletic success variables included in the second model. The R-squared value shows that a little more than half of the dependent variable, total alumni giving, is explained by the dependent variables used.

The F-statistic must also be considered in order to decide if the results from this model are reliable. The critical F-value at the 99% confidence interval is 2.435. In this model the F-value was found to be 75.48. This value is well above the critical value and it can be decided that the results from this model are reliable.

Model II Results

When looking at the results produced from the OLS model it is found that all of the academic variables included, except total cost, are significant. This is different than the results produced for Division I Institutions. For Division I Institutions public school and enrollment variables are not significant but total cost is. The other difference from the results in Model II, compared to Model I, is that the public school variable is the only significant academic variable that results in a negative effect on
alumni giving. The results for Division I schools showed that multiple academic variables had a negative influence on alumni donations. From these results it can be concluded that when looking at the influence of academic variables on alumni giving, it is very important to make a distinction between Division I and Division III Institutions because they behave differently.

The effect of athletic variables on giving must also be determined. There are three athletic success variables included in this model, but only one was found to be significant. The winning percentage for women's basketball was significant and had a positive influence on total alumni donations. This same result is found for Division I sports as well, although the coefficient for Division I women’s winning percentage was smaller than Division III. If the winning percentage increases by 1%, total alumni donations increase be 4.59% for Division I Institutions but increases Division III alumni donations by 5.65%. These results show that the success of the women’s team is more influential for Division III schools than for Division I schools. Neither of the men’s sports teams is found to be significant in the study. The same is true with results found in Model I.

**Board Giving**

Board giving is another form of annual giving explored in this study. The results are not explored in depth because the OLS did not provide any significant results. When looking at Division I Institutions, the R-squared value is very low at 18%. The only athletic variable that was found to be significant is when the women’s basketball team won a national championship. If a national championship is won board giving increases by 15%. When looking at the results for Division III
schools the R-squared value is 32%, much higher than for Division I, but still a low value. The model finds significant results for women and men’s basketball winning percentages. When winning percentage for men and women’s basketball increases by 1% board giving increases by 8.5% for women’s and 7.4% for men’s basketball. These results can be important, but the model used does not explain enough about board giving.

**Athletic Giving**

A final form of annual giving this study explores is athletic giving. Again, this is looked at for Division I and Division III Institutions. Athletic giving is a very unsuccessful model. The R-squared value for Division I is 16% and the F-statistic was lower than the critical value. The model used is not a good representation and should be improved. When looking at results from Division III the R-squared value is only 7% and the F-stat value is too low, again. In order to look deeper into athletic giving a new model would need to be constructed.

**Study Limitations**

This study attempts to build on previous studies done in the same area of concentration. This study has been built to improve from other previous studies, but there are still limitations. These limitations include the amount of private schools used in the data, the number of years and athletic variables represented in the model.

Retrieving data from private schools is much more difficult than it is for public schools. Some data for public schools is private and this makes it harder to find all of the same data. Due to this limitation, there are fewer public schools
present in the study than there are private schools. If more public schools were to be included in the study there would be more observations and the results would be more accurate.

Another limitation in this study is the amount of years included in the study. For Division III institutions the data spans from 1995-2011 and Division I data spans from 2000-2011. There is plenty of data for the models but it could be more accurate if more years were included. It is difficult to include additional years because the years that can be included are dependent on the available data for the sports teams. For some schools data is available on its sports teams spanning all the way back to 1990 and other schools only have data going back to 2000. If more data could be gathered, this would generate results that are more reliable.

The last limitation in this study is the number of athletic success variables included. In the model for Division I Institutions there were more athletic variables included than in the Division III model. Due to the time constraints, data could not be gathered for certain Division III athletic variables. If all variables had been used in the model for Division III institutions, the results would have been more accurate. It can also be helpful in comparing more results across Division I and Division III. This study can also be improved by including more sports teams. There is only one female team being used so it is not possible to compare differences amongst women’s teams.
Final Conclusions

The main purpose of this study is to see if athletic success influences annual donations, and if so, how these influences differ between Division I and Division III Institutions. As discussed at the beginning of this paper, institutions hope each year to reach the highest amount of donations possible. There have been many other studies investigating the determinants of annual giving in order to allow an institution to better understand how to increase donations.

Studies have looked at both academic and athletic variables, but none have yet to combine all of these variables in order to look at both male and female sports across multiple divisions. Many of the variables used in this study are drawn from previous studies, along with the addition of a few new athletic variables. From the results presented in this study, many different conclusions can be drawn.

This study collected data for men and women’s basketball and football for Division I and Division III. The regressions used for both models are able to provide some valuable information. Each Division must be considered separately because both models yield different results. If an Institution is looking at alumni donations it is very important to make sure the have the appropriate model is being used. In order to increase alumni donations at a Division I institution, it is important to focus on certain academic variables. These include the graduation rate, total cost, its top 25 ranking, student-to-faculty ratio and endowment. A division III institution would want to focus on graduation rate, their top 25 ranking, student-faculty ratio,
enrollment and endowment. Being a public school also impacts the amount of donations, but the schools cannot change this.

It is also important to draw conclusions from the athletic success variables. Results from Division I show that women's basketball is the only significant sport included. The women's basketball winning percentage and winning a national championship lead to an increase donations. For Division III the only significant athletic variable is the women's basketball winning percentage. It is very interesting that when studying men's sports there is nothing significant in influencing annual donations for both Division I and Division III institutions. At most institutions the men’s athletics seem much more popular and draw more attention, but they don’t appear to effect alumni donations.

In conclusion, this study shows that athletic success does not play a large role in alumni donations. This study fails to draw any connection to men’s sports and alumni donations. There is a connection drawn to women’s basketball, but it is unknown if all women's sports have a positive impact on alumni donations. This study has helped build on the study of alumni donations but there is still much more work to be done on the subject.
APPENDIX A

OMITTED REGRESSION RESULTS
BOARD GIVING DIVISION I INSTITUTIONS

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Model I Coefficients (T-stats)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRADRATE</td>
<td>Graduation Rate</td>
<td>0.0270 (1.72)</td>
</tr>
<tr>
<td>TOTCOST</td>
<td>Total Cost to attend</td>
<td>-8.46e-06 (-0.49)</td>
</tr>
<tr>
<td>PUBLIC</td>
<td>Dummy variable for Public Schools</td>
<td>-1.28 (-2.20)</td>
</tr>
<tr>
<td>FROSHTOP25</td>
<td>Top 25 World Ranking</td>
<td>0.00695 (0.68)</td>
</tr>
<tr>
<td>SFRATIO</td>
<td>Student to faculty ratio</td>
<td>0.000672 (2.45)</td>
</tr>
<tr>
<td>ENROLL</td>
<td>Total enrollment</td>
<td>9.09e-06 (1.26)</td>
</tr>
<tr>
<td>ENDOW</td>
<td>Log (Endowment)</td>
<td>-0.138 (-0.90)</td>
</tr>
<tr>
<td>NCAABID</td>
<td>Dummy variable bid to NCAA tourney men's basketball</td>
<td>0.0824 (0.28)</td>
</tr>
<tr>
<td>NCAACHMP</td>
<td>Dummy variable winning NCAA tourney men's basketball</td>
<td>-0.0160 (-0.03)</td>
</tr>
<tr>
<td>FOOTBALL%</td>
<td>Winning percentage football</td>
<td>-0.00589 (-1.05)</td>
</tr>
<tr>
<td>BBALL%</td>
<td>Winning percentage men's basketball</td>
<td>0.00141 (0.16)</td>
</tr>
<tr>
<td>BOWLBID</td>
<td>Dummy variable bid to a bowl game</td>
<td>0.132 (0.49)</td>
</tr>
<tr>
<td>BOWLWIN</td>
<td>Dummy Variable winning bowl game</td>
<td>0.0953 (0.34)</td>
</tr>
<tr>
<td>BBALL%W</td>
<td>Winning percentage women's basketball</td>
<td>-0.429 (-0.59)</td>
</tr>
<tr>
<td>NCAABIDW</td>
<td>Dummy variable bid to NCAA tourney women's basketball</td>
<td>-0.0237 (-0.09)</td>
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<tr>
<td>NCAACHMPW</td>
<td>Dummy variable winning NCAA tourney women's</td>
<td>-1.414 (-1.76)</td>
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### OMITTED REGRESSION RESULTS

#### BOARD GIVING DIVISION III INSTITUTIONS

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Model I Coefficients</th>
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<td></td>
<td></td>
<td>(T-stats)</td>
</tr>
<tr>
<td>GRADRATE</td>
<td>Graduation Rate</td>
<td>0.0127 (2.11)</td>
</tr>
<tr>
<td>TOTCOST</td>
<td>Total Cost to attend</td>
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</tr>
<tr>
<td>PUBLIC</td>
<td>Dummy variable for Public Schools</td>
<td>-1.22 (-4.16)</td>
</tr>
<tr>
<td>FROSHTOP25</td>
<td>Top 25 World Ranking</td>
<td>0.00917 (2.34)</td>
</tr>
<tr>
<td>SFRATIO</td>
<td>Student to faculty ratio</td>
<td>0.00476 (1.86)</td>
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<tr>
<td>ENROLL</td>
<td>Total enrollment</td>
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<tr>
<td>ENDOW</td>
<td>Log (Endowment)</td>
<td>0.235 (3.96)</td>
</tr>
<tr>
<td>FOOTBALL%</td>
<td>Winning percentage football</td>
<td>0.158 (0.95)</td>
</tr>
<tr>
<td>BBALL%</td>
<td>Winning percentage men’s basketball</td>
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<tr>
<td>BBALL%W</td>
<td>Winning percentage women’s basketball</td>
<td>0.738 (4.08)</td>
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APPENDIX B

OMITTED REGRESSION RESULTS
ATHLETIC GIVING DIVISION I INSTITUTIONS

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Model I Coefficients (T-stats)</th>
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<tbody>
<tr>
<td>GRADRATE</td>
<td>Graduation Rate</td>
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<td>TOTCOST</td>
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<td>PUBLIC</td>
<td>Dummy variable for Public Schools</td>
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<td>FROSHTOP25</td>
<td>Top 25 World Ranking</td>
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<td>SFRATIO</td>
<td>Student to faculty ratio</td>
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<td>Total enrollment</td>
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<td>Log (Endowment)</td>
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<td>0.124 (0.76)</td>
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<td>NCAACHMP</td>
<td>Dummy variable winning NCAA tourney men's basketball</td>
<td>0.388 (1.30)</td>
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<td>FOOTBALL%</td>
<td>Winning percentage football</td>
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<td>BOWLBD</td>
<td>Dummy variable bid to a bowl game</td>
<td>0.0972 (0.66)</td>
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<tr>
<td>BOWLWIN</td>
<td>Dummy Variable winning bowl game</td>
<td>0.0149 (0.11)</td>
</tr>
<tr>
<td>BBALL%W</td>
<td>Winning percentage women's basketball</td>
<td>-0.540 (-1.33)</td>
</tr>
<tr>
<td>NCAABIDW</td>
<td>Dummy variable bid to NCAA tourney women's basketball</td>
<td>-0.0658 (-0.47)</td>
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<tr>
<td>NCAACHMPW</td>
<td>Dummy variable winning NCAA tourney women's</td>
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OMITTED REGRESSION RESULTS
BOARD GIVING DIVISION III INSTITUTIONS

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<th>Variable</th>
<th>Definition</th>
<th>Model I Coefficients (T-stats)</th>
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<td>Graduation Rate</td>
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<td>TOTCOST</td>
<td>Total Cost to attend</td>
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<tr>
<td>PUBLIC</td>
<td>Dummy variable for Public Schools</td>
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<tr>
<td>FROSHTOP25</td>
<td>Top 25 World Ranking</td>
<td>-0.0117 (-2.89)</td>
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<tr>
<td>SFRATIO</td>
<td>Student to faculty ratio</td>
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<tr>
<td>ENROLL</td>
<td>Total enrollment</td>
<td>0.000039 (0.65)</td>
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<tr>
<td>ENDOW</td>
<td>Log (Endowment)</td>
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<td>FOOTBALL%</td>
<td>Winning percentage football</td>
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<td>BBALL%</td>
<td>Winning percentage men's basketball</td>
<td>0.487 (3.00)</td>
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<tr>
<td>BBALL%W</td>
<td>Winning percentage women's basketball</td>
<td>-0.0478 (-0.28)</td>
</tr>
</tbody>
</table>
SOURCES CONSULTED

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