Effects of Intercollegiate Athletics on Private Giving in Higher Education

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The success of intercollegiate athletics has been recognized as a powerful communication tool to enhance the university profile while an ongoing controversy regarding financial benefits of intercollegiate athletics still exists. Previous research focused primarily on the role of successful athletic programs in either alumni giving or total giving, rather than examining the relationship between academic and athletic giving. There is a need for research taking the direct association between athletic success and athletic giving into account when explaining the relationship between athletic giving and academic giving. The purpose of the study was, therefore, two-fold: to examine whether athletic giving is associated with success in intercollegiate athletic programs; and to explore whether athletic giving crowds out academic giving. A longitudinal design with panel data, including 155 Division I, II, and III universities that have fielded both football and basketball teams over a 10 year period from 2002-2003 to 2011-2012, was employed. Findings evidently supported spillover effects of athletic giving on academic giving rather than crowding out effect. As private giving is becoming one of the most critical financial resources, this study could assist administrators in both academics and athletics to build an optimal sharing structure of their financial resources.
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Over the past two decades, private giving has been the single most important resource for institutions of higher education, accounting for more than 44 percent of total gifts (Council for Aid to Education, 2011). Although the U.S. economy is gradually recovering from a recent recession, charitable contributions to institutions of higher education increased by 8.2 percent in 2011, reaching $30.30 billion (Council for Aid to Education, 2011). However, many institutions of higher education are still faced with inexorable pressure from their financial status since "giving accounted for only 6.5 percent of college expenditures in 2011, and giving for current operations, the dollars that can be used immediately to offset current-year expenses, accounted for 3.8 percent of expenditures" (p. 1).

The success of intercollegiate athletics has been used as a powerful communication tool that increases good publicity and enhances the university profile, which could in turn result in favorable private giving. McCormick and Tinsley (1990) contended that *a symbiotic relationship* between athletics and academics exists in institutions of higher education. They argued that the exclusion of athletic programs could negatively affect academic giving due to this symbiotic relationship. In other words, an athletics program can be a substantial communication source of exposure for almost every school in higher education. Roy, Graeff, and Harmon (2008) also suggested that revenue generating sports can produce intangible benefit such as awareness for an institution that would be equivalent to the advertising effects derived from using traditional mass media outlets.

However, there still exists an ongoing controversy in higher education regarding financial benefits of intercollegiate athletics. Previous research focused primarily on the role of successful athletic programs in either alumni giving or total giving, rather than examining the relationship between academic and athletic giving. Although several studies suspected the indirect relationship between academic and athletic giving (Stinson & Howard, 2007; 2008), there still exists a need for research taking the direct association of athletic variables (e.g., athletic success and athletic giving) into account when explaining whether athletic giving crowds out academic giving. The purpose of this study is, therefore, two-fold: to examine whether the current dollars of voluntary support restricted to athletics (e.g., athletic giving) are associated with success in intercollegiate athletic programs; and to explore whether athletic giving crowds out the current dollars of voluntary support restricted to academic purposes (e.g., academic giving). This study was intended to provide empirical evidence of relationships between athletic and academic contribution by properly considering it in econometric models.

The results derived from this study will help decision makers who are responsible for directing policy and budgets in both athletic and academic sectors develop a symbiotic relationship between athletics and academics (McCormick & Tinsley, 1990). As private giving is becoming one of the most critical financial resources in higher education, it is important for college and university administrators to carefully evaluate the extent to which a financial amity exists between academics and athletics.

This evaluation would assist administrators in higher education in building an optimal sharing structure of financial resources as well as to better understand donor behaviors as a whole for reducing the controversial gap in private giving for athletics and academics. Further, the findings from this study would serve as the groundwork for the National Collegiate Athletic Association (NCAA) to better scrutinize empirical data regarding the financial role of successful intercollegiate athletic programs in higher education; as well as help them formulate strategies to

develop a positive synergetic relationship between athletics and academics for its member institutions that compete in the different divisions.

Financial Benefits of the Successful Intercollegiate Athletics

The literature concerning the financial impact of intercollegiate athletic success on institutions of higher education has shown two varying perspectives that have created an on-going debate in the field of sports economics. For example, Sigelman and Carter (1979) examined the relationship between alumni giving and the success of football/basketball among nine Division I universities. They concluded there was no evidence of a statistically significant association between successful athletic performance and alumni giving. Gaski and Etzel (1984) studied the relationships between football and basketball records and the various giving variables (e.g., total contribution, annuli contribution, non-alumni contributions, etc). They found insignificant results indicating that there were no relationships between athletic success and alumni contributions.

These findings were also consistent with the study conducted by Turner, Meserve, and Bowen (2001) using 15 private colleges and universities from NCAA Division I-A, Ivy League, and NCAA Division III. They indicated that no significant link existed between football winning percentage and giving at NCAA Division I-A and Ivy League schools. However, a small marginal effect on alumni giving was found at NCAA Division III schools. Finally, a study by Shulman and Bowen (2001) used a sample comprised of 18 private institutions of higher education and examined the relationship between the success of intercollegiate athletics and alumni giving. The major finding was that athletic success addressed by the football winning percentage was an insignificant predictor in private contributions.

On the other hand, a considerable number of studies supporting the positive economic impact of intercollegiate athletic success are worth noting. A study conducted by Brooker and Klastorin (1981) used 58 institutions of major conferences from 1963 to 1971 to examine the link between college athletics and alumni giving. Findings supported a positive association between percentage of alumni giving and football winning percentage. This was consistent with Grimes and Chressanthis (1994), who employed time-series data from one university to investigate the variations of alumni giving over extended times of athletic success and failure. They found a positive relationship between athletic success and alumni giving indicating that for every one percent increase in the overall winning percentage for athletic programs, alumni giving to academics increased by about $300,000.

Rhoads and Gerking (2000) also argued that the success of intercollegiate athletics is associated with charitable educational contributions. They used both NCAA Division I football and basketball data from 87 universities to develop empirical evidence that alumni educational giving is positively regressed on the success of football and basketball programs, especially, a football bowl and an NCAA basketball tournament appearance.

In 2008, a study derived from Stinson and Howard using a total of 208 NCAA Division I-AA and I-AAA schools, revealed that the success of football and basketball programs goes along with both academic and athletic gains in the form of increased private giving. On the other hand, they argued that athletic giving was not a powerful predictor to explain academic giving as the partial correlation coefficient, holding other factors constant, revealed a weak relationship (e.g., $r = .155$). They also asserted that this phenomenon was due to the indirect relationship between academic and athletic giving. Accordingly, both the effects of athletic success and the current

dollars of voluntary support restricted to athletic purpose could be considered simultaneously to better explain the relationship between athletic giving and academic giving.

In conjunction with the aforementioned debate, a number of researchers and administrators in higher education have suspected crowding out effects of athletic giving on academic giving as many donors directly restrict their giving to certain areas. Crowding out effect is an economic concept where increased public subsidies drives down private giving. Thus, early work has found evidence of crowding out in the relationship between public subsidies and private giving (e.g., Roberts, 1984; Steinberg, 1987) while this economic concept has been used to explain whether intercollegiate athletics have a negative or positive effect on institutional support (e.g., Stinson & Howard, 2008). Crowding out effects in the context of intercollegiate athletics are considered to be any decrease in academic contributions that occurs due to an increase in athletic contributions. In other words, if athletic giving is accompanied by the success of athletic programs, giving to athletics would be increased, which would lead to a decrease in academic giving. Therefore, it would be worthwhile to explore how athletic giving and the success of intercollegiate athletic programs affect academic giving.

In particular, a one-year lag in the variables of athletic performance and athletic giving was employed to evaluate the current dollars of voluntary support restricted to athletics as "most athletic gifts are made early in the school year, prior to the start of most teams' seasons" (Meer & Rosen, 2009, p. 289). Meer and Rosen (2009) examined both current and lagged athletic success and found that lagged athletic success had more explanatory power than current athletic success. Rhoads and Gerking (2000) also argued that participation in a bowl game in one year might stimulate the dollars of voluntary support in the next year. Based on the foregoing discussion, the following research questions (RQ) have been developed.

- RQ_1: Are the current dollars of voluntary support restricted to athletics influenced by the one-year lag in football winning, basketball wining, and athletic giving?
- RQ_2: Are intercollegiate athletic success and athletic giving associated with a significant decrease in the current dollars of voluntary support restricted to academic purposes?

Method

Data

The study used a purposive sample of 155 universities which had a balanced panel dataset, respectively. The selected schools have competed in Division I, II, and III and have fielded both football and basketball teams over a 10 year period from 2002- 2003 to 2011-2012. Balanced data is preferred over unbalanced panels as it diminishes the noise caused by missing observations. This dataset contained 1,550 observations and a set of variables representing academic and athletic financial status, academic characteristics, and athletic success of each institution as well as specifying economic condition. A panel dataset is often useful because it provides more data points, and accounts for economic effects that cannot be addressed with the use of either cross-section or time series data alone (Pindyck & Rubinfeld, 1998). Therefore, the panel dataset for this study allows scrutiny of the variation in the giving to different institutions at a particular point in time. Details of each variable included in the model were as follows.

Giving. All giving data were obtained from the database of the Council for Aid to Education (e.g., http://www.cae.org) in order to examine the crowding out effects of private

giving to athletics on those of academics. The Council for Aid to Education (CAE) is a national non-profit organization whose role is to provide empirical data on various giving in the institutions of higher education derived from the annual Voluntary Support of Education (VSE) survey. The CAE database has been also utilized as a reliable resource for the previous studies (e.g., Badde & Sundberg, 1996; Cunningham & Conchi-Ficno, 2002; Gottfried & Johnson, 2006; Rhoads & Gerking, 2000). Therefore, in this study, academic giving was calculated by aggregating the dollars of voluntary support restricted to academic purposes while athletic giving was considered as the current dollars of voluntary support restricted to athletic purpose from individuals. Neither was associated with contributions from charitable foundations, business, and religious organizations.

Athletic factors. In order to examine the effects of intercollegiate athletic success on both academic and athletic giving, data were collected from the NCAA website (e.g., http://web1.ncaa.org/stats/StatsSrv/careerteamwinloss). This website has compiled statistics for college sports since the early 1940s. This study employed the school's winning percentages for football and the men's basketball, because it has been considered one of the most popular measures representing overall athletic success during season (e.g., Brooker & Klastorin, 1981; Grimes & Chressanthis, 1994; McCormick & Tinsley, 1990; Tucker, 1995, 2004). Although previous studies have often incorporated two and three measures (e.g., post-season appearance, end-of-season rankings, and winning percentage for each sport) into their econometric models to evaluate the relationship between the success of intercollegiate athletics and alumni giving, this study exclusively employed winning percentage, in order to avoid possible multicollinearity issues that often occur when multiple measures are being used.

University–specific factors. The total number of students enrolled was considered to be one of the university–specific factors that affect the level of academic giving. This was primarily because when an institution has more students, there is a higher probability of having successful alumni that can financially support their alma mater. Student enrollment data for an institution consist of a total university student headcount for the fall academic semester, which is obtained from the database of the CAE (Tucker, 2004). The second factor was the quality of a school which could positively affect academic giving. An academic reputation score that is annually announced in the U.S. News and World Report was used to evaluate the academic quality of each institution. An average 4-year graduation rate was also added to the model as the third factor since the higher graduation rate an institution has the more quality graduates the school produces (Tucker, 2004).

Finally, the macroeconomic data of per capita personal income by state was used to control the economic conditions of respective institutions during a specific time period, which could affect the overall giving patterns of donors. This measure of income was calculated as the total personal income of the residents of an area divided by the population of the area. Data was obtained from the database of the "Federal Reserve Bank of St. Louis" (e.g., http://research.stlouisfed.org) which compiles federal and state statistics explaining a variety of economic circumstances. In particular, the primary reason for employing state level personal income data rather than using national level is to better represent the economic status of the residents of a state.

Empirical Model

      The study employed fixed effects models that allow for the examination of whether athletic giving creates crowding-out effects on academic giving. The main advantage of using fixed effects methods is the increased ability to control for unobservable individual-specific (e.g., schools) heterogeneity, thereby eliminating potentially large sources of bias. The effects of successful intercollegiate athletic programs and athletic giving on the current dollars of voluntary support restricted to academic purposes were estimated by the following econometric model:

$$Y_{it} = C_0 + \lambda_i + \sum \beta_i X_{it-1} + \sum \gamma_i Z_{it} + \varepsilon_{it}$$

where Y_{it} indicates the current dollar amounts restricted to academic purposes (e.g., academic giving) in academic year t for a particular university i which is the dependent variable; C_0 is a constant term; λ_i is unobserved institution-specific effects. Specifically, the vector of athletic variables, $\sum \beta_i X_{it-1}$, include the one year lagged athletic giving, football winning percentage, and men's basketball winning percentage. In addition, the vector of academic variables, $\sum \gamma_i Z_{it}$, includes the number of students enrolled, the school ranking, the average 4-year graduation rate, and per capita personal income in academic year t for a particular university i. Finally, β_i and γ_i are coefficients for the independent variables while ε_{it} indicates the error term.

Data Analysis

      The analysis of panel data was performed using the EViews 6.0 program. Fixed effects models were used to examine how the current changes in athletic success influence athletic giving and to investigate whether the current dollars of voluntary support restricted to athletic purpose crowds out the current dollars restricted to academic purposes. In particular, a two-stage modeling strategy recommended by Stinson and Howard (2007) was employed to evaluate the crowding out effects of athletic giving on academic giving.

      In the first stage, the fixed effects model contained only university specific variables to explain the current dollars of voluntary support restricted to academic purposes while athletic variables were entered into the respective fixed effects models in the second stage. The use of this particular strategy allows scrutiny of the impact of athletic giving derived from successful athletic performance on giving restricted to academic purposes, rather than comparing different models (Stinson & Howard, 2007).

Results

Descriptive Statistics

      Academic giving and athletic giving by a total of 155 institutions over the period 2002-2003 to 2011-2012 were extracted from the annual VSE survey reported. Rhoads and Gerking (2000) recommended that private giving scaled by the number of enrolled students could control for university size. Accordingly, an average dollar amount in both academic and athletic giving divided by an average number of enrolled students over 10 years across institutions was calculated. Findings demonstrated that a 10-year average of academic giving ranged from $9,063.29 (i.e., Stanford University) to $14.12 (i.e., Assumption College) and that of athletic

giving ranged from $1,121.83 (i.e., Wake Forest University) to $1.67 (i.e., Millersville University of Pennsylvania), respectively.

In addition, the average total academic giving during the 2002-2003 and 2011-2012 academic years was slightly over $6.4 million while that of athletic giving was about $2.2 million for institutions in the sample. Of the total 155 sampled institutions, the number of NCAA Division I, II, and III schools were 64, 23, and 68, respectively. Slightly more than half were private ($n = 80$ or 51.61%) and the average enrollment was 14,309 students. The average winning percentage for football was about .50 percent and that of basketball was .55 percent across the 155 intuitions while the average per capita personal income representing economic status was slightly over $36,807. Although both academic and athletic giving demonstrated considerable variation among the sampled schools, giving data were not transformed into the natural logarithm due to the interpretational difficulties of findings.

Effects of Athletic Performance on Athletic Giving

The first research question examined whether the current dollars of voluntary support restricted to athletics are associated with success in intercollegiate athletic programs and athletic giving. The one-year lagged athletic variables (e.g., football winning, basketball winning, athletic giving) were placed into the econometric model to explain the current dollars of voluntary support restricted to athletics.

Table 1 - *Effects of Athletic Performance on Athletic Giving*

Variable	Effect Estimate	Std. Error	*t*	*p*
Constant	-202,416	134,729	-1.50	0.133
Football Winning (-1)	452,118	153,809	2.93	**0.003
Basketball Winning (-1)	270,469	197,246	1.37	0.170
Athletic Giving (-1)	0.997	0.008	116.15	***0.000

*Notes. * p<.05, **p<.01, ***p<.001*

Random effects specifications of equation were rejected by Hausman tests: χ^2 (1395, 3) = 565.00, $p<.000$. The results revealed that the unobserved time-invariant characteristics for each school were correlated with explanatory variables. Thus, fixed effects specifications of the equation were employed to explain the current dollars of voluntary support restricted to athletics. As shown in Table 1, results of the fixed effects model identified that the one year lagged football winning percentage ($t = 2.47$, $p =.01$) and athletic giving ($t = 101.07$, $p =.000$) were significant determinants in predicting the current dollars of voluntary support restricted to athletics after removing heterogeneity among universities.

For example, for every one percent improvement in football win-loss record, the current dollar amounts restricted to athletic purpose will increase by approximately $452,000, holding other explanatory variables constant, although basketball winning was not statistically significant at the .05 level. Results also revealed that for every $1 increase in athletic contribution in the previous year, the current dollars of voluntary support restricted to athletics will increase by almost the same amount. These findings also suggested that lag correlation might exist in athletic contribution.

Crowding Out Effects of Athletic Giving on Academic Giving

The second research question examined whether intercollegiate athletic success and athletic giving are associated with a significant decrease in the current dollars of voluntary support restricted to academic purposes. In particular, a two-stage modeling strategy recommended by Stinson and Howard (2007) was used to examine the crowding out effects of athletic variables. This approach was considered to directly securitize the effects of athletic variables on the current dollar amounts of academic giving, rather than to compare academic and athletic econometric models (Stinson & Howard, 2007).

As shown in Table 2, the first fixed effects model contained only university specific variables to predict the current dollars of voluntary support restricted to academic purposes. Results of the Hausman tests indicated that random effects specifications of equation were rejected at the .05 level: $\chi^2 (1550, 4) = 20.13$, $p < .000$. The results revealed that the source of university–specific heterogeneity was correlated with explanatory variables. Thus, the fixed effects model was utilized to explain the relationships between university specific variables and current voluntary support restricted to academic purposes.

Table 2 - *Effects of Academic Variables on Academic Giving*

Variable	Effect Estimate	Std. Error	*t*	*p*
Constant	-20,132,530	5,372,918	-3.74	***0.000
Enrollment	405.45	56.91	7.12	***0.000
Graduation Rate	116,365	39,363	2.95	**0.003
Personal Income	23.80	98.16	0.24	0.808
Ranking	3,948,312	1,230,950	3.20	**0.001

*Notes. * p<.05, **p<.01, ***p<.001*

Results of the fixed effects model indicated that current student enrollment, average 4-year graduation rate, and school ranking were significant predictors for the current dollars of voluntary support restricted to academic purposes after removing heterogeneity among universities although per personal capita income by state was not statistically significant at the .05 level. For example, the positive effect of enrollment on academic giving, significant at the .05 level ($t = 7.12$, $p < .001$), resulted in an estimated change of about $405 in the current dollars of voluntary support restricted to academic purposes for every one student increase in enrollment, controlling for the other variables. The effect of the average 4-year graduation rate was also significant at the .05 level ($t = 2.95$, $p = .003$). The results indicated that an estimated change of approximately $116,000 was associated with every one percent increase in graduation rate, controlling for the other variables. The positive effect of school ranking on academic giving, significant at the .05 level ($t = 3.20$, $p = .014$), revealed an estimated change of approximately $3.95 million in the current dollars of voluntary support restricted to academic purposes for every unit change in school ranking, controlling for the other variables.

The second fixed effects model included the one year lagged athletic giving and performance in addition to the university specific variables in order to examine whether athletic factors crowd out the current dollars of voluntary support restricted to academic purposes. Hausman statistics on the random effects estimates of equations were statistically significant: χ^2 (1395, 7) = 25.40, p=.000. Results suggested that the unobserved time-invariant characteristics for each school were correlated with explanatory variables. Accordingly, the fixed effects model was preferred to the random effects model in this study.

Table 3 - *Effects of Academic and Athletic Variables on Academic Giving*

Variable	Effect Estimate	Std. Error	*t*	*p*
Constant	-20,385,087	5,509,553	-3.69	***0.000
Enrollment	329.5814	60.45	5.45	***0.000
Graduation Rate	99,625.44	39,372	2.53	*0.011
Personal Income	69.16	99.00	0.69	0.484
Ranking	3,697,170	1,216,950	3.03	**0.002
Football Winning (-1)	1,545,881	713,437	2.16	*0.030

Basketball Winning (-1)	-418,819.3	898,265	-0.46	0.641
Athletic Giving (-1)	0.483	0.082	5.87	***0.000

*Notes. * p<.05, **p<.01, ***p<.001*

As shown in Table 3, results of the fixed effects model indicated that all academic variables (e.g., enrollment, graduation rate, and school ranking) excluding per capita income were positively associated with the current dollars of voluntary support restricted to academic purposes, statistically significant at the .05 level. For example, the effect of enrollment on academic giving was statistically significant at the .05 level ($t = 5.45$, p < .001), resulting in an estimated change of about $329 in current voluntary support restricted to academic purposes for every one student increase in enrollment, holding other explanatory variables constant. The effect of graduation rate on academic giving was statistically significant at the .05 level ($t = 2.53$, $p = .011$). The result indicated that an estimated change of approximate $100,000 was associated with every one percent increase in an average 4-year graduation rate, holding other explanatory variables constant. The effect of school ranking on academic giving was also statistically significant at the .05 level ($t = 3.03$, $p = .002$). The results specified that an estimated change of approximately $3.7 million in the current dollars of voluntary support restricted to academic purposes for every one unit (e.g., .1 point) increase in school ranking, controlling for the other variables.

Regarding a set of athletic variables, results of the fixed effects model indicated that the one-year lagged football winning percentage and athletic giving were significant determinants in predicting the current dollars of voluntary support restricted to academic purposes while basketball winning percentage was not statistically associated with academic contribution ($t = -.46$, $p = .64$). For example, the effect of football winning on academic giving was significant at the .05 level ($t = 2.53$, $p = .011$), indicating that for every one percent improvement in football win-loss record during the previous season, the current dollar amounts restricted to academic purposes will increase by approximately $1.5 million, holding other explanatory variables constant. The effects of athletic giving on academic giving was also statistically significant at the .05 level ($t = 5.87$, $p < .000$). The results revealed that for every $1 increase in athletic contribution during the previous season, the current dollars of voluntary support restricted to academics will increase by about 48 cents.

Discussion and Conclusions

The current study has analyzed how the variation in the performance of intercollegiate athletic programs influences the current dollars of voluntary support restricted to athletic purpose and has scrutinized whether athletic giving crowds out academic giving. First, findings from fixed effects analyses of panel data for the period of 2002-2003 to 2011-2012 revealed that the variation in football winning percentage, not surprisingly, had a significant impact on the current dollars of voluntary support restricted to athletic purpose. The one-year lagged football winning percentage and athletic giving were significant determinants in predicting the current dollars of voluntary support restricted to athletics. Findings were equivalent to the study conducted by Meer and Rosen (2009) indicating the one-year lagged athletic success had more explanatory

power than current athletic success in explaining athletic giving. Rhoads and Gerking (2000) also supported this phenomenon by stating that a bowl game participation in one year might stimulate the next year contribution.

Findings indicated that every 1% increase in football winning percentage in the previous year was associated with an increase of approximately $452,000 in athletic giving. Also, every $1 increase in the one-year lagged athletic giving was related to the current dollars of athletic giving at the nearly same rate. These findings were consistent with a number of previous studies (e.g., Brooker & Klastorin, 1981, Grimes & Chressanthis, 1994; Rhoads & Gerking, 2000; Stinson & Howard, 2008) supporting the notion that private contributions are positively regressed on the success of intercollegiate athletic programs. Especially, the coefficient on football winning indicated a smaller significant impact as compared to the previous research (c.f., Humphreys, 2006). This could occur when the current study focused primarily on the role of athletic performance on the amount of voluntary support restricted to athletic purpose rather than those in total giving, which contained both academic and athletic contributions. Football winning percentage has led the relatively increase in athletic giving, consistent with findings derived from Grimes and Chressanthis (1994) and Tucker (2004).

Second, a two-step modeling strategy (Stinson & Howard, 2007) was employed to examine the crowding out effects of athletic variables on the current dollars of voluntary support restricted to academic purposes. Both fixed effects models provided the same patterns of the effects of university specific variables on academic giving. Not surprisingly, all academic variables (e.g., enrollment, graduation rate, and school ranking), excluding per capita income, were positively associated with the current dollars of voluntary support restricted to academic purposes. In addition to university specific variables, the one year lag in football winning and athletic giving were considered as significant explanatory variables in predicting the current academic giving. However, basketball winning percentage was not associated with the current dollar amounts that were restricted to academic purposes.

Findings revealed that for each student increase in enrollment, there was an associated estimated change of about $405 of voluntary support restricted to academic purposes. Humphreys and Mondello (2007) specified that the higher the number of students enrolled, the more alumni could be produced over time which, in turn, increased the probability of financial support for a particular university in higher education. Their perspective was consistent with Grimes and Chressanthis (1994) specifying that "academics are positively related to the number of potential alumni donors" (p. 35). In addition, one percent increase in graduation rate caused an estimated change of approximately $116,000 in academic giving while every unit change in school ranking resulted in an estimated change of $394,000, respectively. Similar results were found in the study addressed by McCormick and Tinsley (1990). They argued that the quality of academic programs is related to the careers of the alumni who are known as the primary resource for academic giving. Therefore, it is obvious that there is a higher probability of producing successful alumni that can financially support their alma mater when an institution continues to maintain the higher academic reputation.

On the other hand, the current study did not find any significant impacts of per capita income on academic giving although the positive and significant coefficient of personal income was expected. Grimes and Chressanthis (1994) highlighted that healthy economic conditions could enhance the ability of individuals to contribute increased voluntary support for academics. McCormick and Tinsley (1990) also indicated that a positive and significant association between personal income status and voluntary contribution existed. However, this phenomenon might not

have happened in this study because the time periods used for analyses were mostly under economic stagnation and its significance was sensitive to model specification. In addition, per capita income might not reflect a certain condition that a graduate of a private school in rural Massachusetts gets a high paying job in New York City. In other words, the per capita income of the area of the school may not be high, but the graduate may have the ability to give back a high sum of money.

Finally, findings clearly revealed evidence that athletic giving had "no" crowding out effects on academic giving. As the coefficients on athletic giving and football winning percentage were statistically significant from zero, there was a significant and positive causal relationship between athletic factors and academic giving. For example, the coefficient on athletic giving implied that for every $1 increase in athletic giving, the current dollars of voluntary support restricted to academic purposes will increase by 48 cents. The coefficients on football winning percentage identified that for every one percent improvement in football win-loss record, the current dollars of volunteer support restricted to academics will increase by approximately $1.5 million.

Findings were consistent with the perspective derived from McCormick and Tinsley (1990) supporting a symbiotic relationship between athletics and academics. They argued that the exclusion of athletic programs could negatively affect the current dollars of volunteer support restricted to academics in institutions of higher education due to the symbiotic relationship between athletics and academics. Successful athletic programs are able to create substantial exposure for schools in higher education, which is equivalent to the advertising effects derived from using traditional mass media outlets (Roy, Graeff, & Harmon, 2008). Further, findings from the current study which point to a positive relationship between enrollment numbers and graduation rates with academic giving might be good news for university administrators who advocate athletic success as a way to increase student applications. Indeed, a recent study by Chung (2013) found support for the "Flutie Effect", noting that athletic success has a significant long-term goodwill effect on future applications (benefiting enrollment numbers) and student quality (benefiting graduation rates). Future research might attempt to empirically connect these constructs. Consequently, a spillover benefit (Grimes & Chressanthis, 1994) rather than crowding out effects exists in the relationships between athletic factors and academic giving. Findings from the current study evidently supported spillover effects of athletic giving on academic giving.

The current study was intended to make three specific contributions to the existing body of literature. First, the study focused on distinguishing private contributions into both academic and athletic giving. This approach allowed for proper examination of the crowding out effects that athletic giving had on academic giving; which differed from most of the previous studies that have typically focused on alumni giving as a whole. Second, in order to examine the association between athletic factors (e.g., football winning percentage, basketball winning percentage, and athletic giving) and the current dollars of voluntary support restricted to academic purposes, the one-year lagged athletic performance and athletic giving were considered in the current econometric models. Several studies indicated that lagged athletic success had more explanatory power to explain the current private donations. (Meer & Rosen, 2009; Rhoads & Gerking, 2000). The contribution could provide empirical evidence to clarify an uncertain financial relationship between athletics and academics in institutions of higher education. The last contribution provided by this study was the employment of fixed effects models to control for university-specific heterogeneity. This method could eliminate potential bias for the model

when unobservable specific-fixed effects might be correlated with independent variables or error term (Ashenfelter, Levine, & Zimmerman, 2003).

Limitation and Future Research

The current study has limitations that provide important guidelines for future investigations although the study provides critical insights on the subject of the crowding out effects of athletic giving on academic giving. First, the use of balanced panel data composed of a relatively small number of cross-sectional and time observations can cause an issue of generalization. Second, institutional heterogeneity can often affect the relationships among the success of intercollegiate athletics, athletic giving, and academic giving. For instance, the institutional fundraising system has been classified into two distinct structures. Some institutions autonomously operate athletic fundraising programs within the intercollegiate athletic department, while other athletic fundraising programs are nested in the institutional-level unit (e.g., department of development). This may also affect different ways of using funds given (e.g., pay bills versus build a new training facility) possibly resulting in direct or indirect impacts on the success of intercollegiate athletics.

Third, the association among athletic performance, athletic giving, and academic giving can be varied across the levels of NCAA competition. Baade and Sundberg (1996) indicated that the success of the intercollegiate athletic department is more significantly related to the annual giving in Division III institutions as opposed to the other Divisions. However, as including fixed effects (e.g., group dummies) soaked up all the across-school differences in any observable or unobservable predictors (Plumper & Troeger, 2007), the present model determined by Hausman statistics could not permit another dummy available to examine effects of NCAA Divisions. Also, due to the difference in the total number of sampled schools in each division, the calculated statistic may be subjugated by the variances for Division III schools. Thus, the test is less likely to correctly identify significant differences in NCAA Divisions even though the different model (e.g., random effect models) would be employed to examine the relationships between athletic giving and academic giving across NCAA Divisions.

It is a necessary condition to develop proper econometric models taking the direct association with other important time-invariant variables into account when explaining the relationships of the current dollars that are restricted to athletics and academics. For instance, future studies will continue to explore whether the NCAA divisions and the institutional fundraising system affect the dollars of voluntary support for athletics and academics. Particularly, the use of a large data set will allow for the development of a robust econometric model. It will also provide more details regarding a donor's giving pattern if future research can utilize micro-level time data (e.g., individual donor data for several decades) in order to analyze the crowding out effects of athletic giving and properly provide future directions for giving campaigns.

In addition, one of our findings suggested that lag correlation might exist in giving data while autocorrelation is a mathematical tool for finding repeating patterns (Weisang & Awazu, 2008). Accordingly, there exists a need for determining the appropriate lags in giving data by using an autoregressive model (AR) or an autoregressive moving average (ARMA) model. This effort will assist researchers in the field of sport management to provide an improved econometric model meeting statistical parsimoniousness.

Finally, although this study is not able to explain the complexity of crowding out effects of athletic giving, it is a preliminary step in understanding athletic related variables that captures the crowd-out effect when one estimates the association between athletic and academic giving. This effort will expand our knowledge base and provide more accurate information for administrators in higher education who are in charge of directing policy and budget in both athletic and academic areas. It is hoped that this study will serve as practical evidence to formulate strategies for a positive symbiotic relationship between athletics and academics.

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