The Impact of Athletic Performance on Alumni Giving: An Analysis of Micro Data

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Abstract

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An ongoing controversy in the literature on the economics of higher education centers on whether the success of a school's athletic program affects alumni donations. This paper uses a unique data set to investigate this issue. The data contain detailed information about donations made by alumni of a selective research university as well as a variety of their economic and demographic characteristics. One important question is how to characterize the success of an athletic program. We focus not only on the performance of the most visible teams, football and basketball, but also on the success of the team on which he or she played as an undergraduate.

One of our key findings is that the impact of athletic success on donations differs for men and women. When a male graduate's former team wins its conference championship, his donations for general purposes increase by about 7 percent and his donations to the athletic program increase by about the same percentage. Football and basketball records generally have small and statistically insignificant effects; in some specifications, a winning basketball season reduces donations. For women there is no statistically discernible effect of a former team's success on current giving; as is the case for men, the impacts of football and basketball, while statistically significant in some specifications, are not important in magnitude. Another novel result is that for males, varsity athletes whose teams were successful when they were undergraduates subsequently make larger donations to the athletic program. For example, if a male alumnus's team won its conference championship during his senior year, his subsequent giving to the athletic program is about 8 percent a year higher, *ceteris paribus.*

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1. Introduction

The role of athletics on college campuses has been a matter of intense controversy for years. As the two authoritative books by William Bowen and his colleagues (Bowen and Levin [2005], Shulman and Bowen [2002]) make clear, athletics affects nearly every facet of campus life. The impact of sports on university finances has been a particularly contentious issue. The focus of this paper is on one important aspect of this topic, namely, whether winning teams induce alumni to make more donations, and if so, whether these donations go to the support of the university as a whole or only to the athletic program.

A considerable amount of empirical work has been done on this topic. Papers typically analyze data at the institutional level and focus mainly on the impact of major sports such as football and men's basketball. While interesting and informative, such studies may leave out an important part of the picture. To see why, note that previous research has documented that participation in varsity athletics is positively correlated with subsequent giving (Clotfelter [2003], Dugan *et al.* [1999], Meer and Rosen [forthcoming]). The usual assumption is that this correlation arises because participation in varsity sports increases the affinity that students feel for their college (Monks [2003]). If affection for the team on which an undergraduate played affects his or her attitude toward the institution, then the subsequent success of that team might affect giving behavior. Studies using institutional-level data cannot investigate this phenomenon. Neither can such data allow one to address the closely related question of whether the performance of an alumnus's team at the time he or she was an undergraduate affects subsequent giving.

This paper uses a unique data set to estimate how alumni contributions to a selective research university are affected by the performance of its athletic teams. The proprietary data provided by this university, henceforth referred to as Anon U, contain detailed information about

donations made by alumni as well as a variety of their economic and demographic characteristics. In particular, we know on which teams, if any, each alumnus participated when he or she was an undergraduate. We then gathered data on the performance of each of these teams, allowing us to examine the relationship between performance and an individual's donations.

In Section 2 we briefly review some pertinent research in this area. Section 3 describes the data and econometric framework. The results are presented in Section 4. We find that for males, donations for both general purposes and for the athletic program increase with the success of the alumnus's former team. Further, male varsity athletes whose teams were successful when they were upperclassmen subsequently make larger donations to the athletic program. The results for females are quite different. Neither the contemporaneous performance of their former team nor its performance when they were undergraduates affects giving for either general purposes or for the athletic program. Section 5 discusses the sensitivity of the results to alternative specifications of the model. The results are robust to the exclusion of outliers and to the inclusion of fixed effects. Section 6 concludes with a summary and suggestions for future research.

2. Previous Literature

There is an extensive literature on the relationship between athletic success and alumni giving (see Frank [2004] and Litan *et al.* [2003]). We provide a brief review that focuses on methodological issues.

Several studies examine time series of overall giving at an individual institution and how it varies with the success of major sports teams (Goff [2004], Grimes and Chressanthis [1994]). The advantage of this approach is that one need not be concerned about biases that might emerge from jointly analyzing institutions that are very different with respect to the role played by athlet-

ics. A drawback is that it may be difficult to disentangle the impact of team performance in a given year from any other variable that might have been influencing the giving environment in that year. An alternative and more common approach is to pool time series data on a group of institutions. (See, for example, Turner, Meserve and Bowen [2001], Cunningham and Cochi-Ficano [2002], Litan *et al.* [2003], and Humphreys and Mondello [2005].) Typically, a measure of alumni giving is regressed on some measure of sports success, such as the football team's record, other variables that vary with time, a fixed effect for the institution, and time effects. A number of papers distinguish between general purpose giving and giving to support athletic programs. The distinction is important because an increase in total giving that goes to support athletic programs may have a different impact on the institution than an increase that increases support for general purposes.

The literature shows that few results hold in general. Turner, Meserve and Bowen [2001], for example, find that a winning football season can either increase or decrease giving depending on whether the institution is in Division I-A (which consists of athletic scholarship granting institutions with high minimum football game attendance), whether the school is a small liberal arts college, and so on. Interestingly, their results suggest that it is not clear that a winning football season increases giving to a school's athletic program, let alone giving to support other programs in the institution (p. 822). More generally, taken as a group, the findings in the literature are inconclusive. As Kahn [2007, p. 222] notes, the estimates are sensitive to which variables are included, whether the model includes university fixed effects, how athletic success is defined, whether the sample includes public or private universities, and so on.

One could reasonably conclude from this lack of robustness that the usual assumptions needed for identification when pooling data from different institutions may not be valid in this

context. However, as already noted, analyzing aggregate time series data from a single institution has its own problems. A more sensible approach is to analyze decision-making at a single institution, but at the individual level. Using micro data confers other benefits that are not available in either the time series or panel analyses of aggregate data. First, we can learn more about which team's performance is relevant. The usual assumption is that only the football team's record is important, as well as perhaps one or two other major sports such as men's basketball. But alumni may develop affinities to the teams on which they played as undergraduates—to a former rower, for instance, the performance of the crew team may be more important than that of the football team. Second, with micro data one can learn how characteristics of alumni such as gender interact with team performance in the determination of giving. Third, such data allow us to control as thoroughly as possible for other attributes that may confound the relationship between athletics and giving, such as academic performance.

3. Data and Econometric Model

3.1 Data

Our primary data source is the administrative archives of Anon U's Development Office, which contain information on all alumni donations, both to general funds and to athletic programs, from 1983 to 2006. The data are proprietary and sensitive, and individuals' names were stripped from the records before being made available to us. Our unit of observation is a yearly giving opportunity. For example, if an individual has been an alumna for 5 years, she accounts for 5 giving opportunities in our analysis, starting in the first fiscal year after graduation. Multiple gifts for the same purpose in the same year are summed together. The Development Office data also include information on academic major, extracurricular activities when the alumnus

was an undergraduate, post graduate education, occupation, residence, and whether he or she is married to another graduate of Anon U. The information on extracurricular activities is quite detailed, including every varsity team on which the alumnus played as an undergraduate. We were able to determine each team's conference finish in every year, using publicly available data.[1]

Anon U's Registrar supplemented these data with information on SAT scores, academic honors, ethnicity, type of high school, summary evaluations made by the Admissions Office during the application process, and grade point average. The Registrar's data are available only for the classes of 1972 and onwards, so we restrict our analysis to this group of individuals. Our basic analysis sample has 293,683 observations on 18,892 alumni for males and 156,226 observations on 11,930 alumnae for females. There are 7,228 male former athletes with 107,948 associated observations, while female former athletes number 3,542, with 42,978 associated observations. The mean number of observations per individual is 9.9**.**

As noted above, in our context it is critical to distinguish between general giving and giving to athletic programs.[2] We therefore analyze the amounts donated in any given year for both general funds and the athletic program.[3] The means and standard deviations of each of these variables are detailed in Table 1. The unconditional mean gift for general purposes (in 2006 dollars) is $507 with a standard deviation of $53,669. The mean gift for men is $531 (s.d. = $18,662), while the mean gift for women $463 (s.d. = $87,410). The mean gift to the athletic program is $57 (standard deviation = $1,920); the figure for men is $63 (s.d. = $1,825), while for women, it is $43 (s.d. = $2,141). The relatively large standard deviations for these variables re-

[1] For alumni who were on multiple teams, the team whose season was more successful in a given year is designated as the "own team" in that year.
[2] We define giving to the athletic program as consisting of gifts earmarked for booster or friends groups, athletics prizes, awards, and coaching, as well as gifts to the athletic department and athletic facilities construction and maintenance. Gifts earmarked for club and intramural sports or recreational athletics are considered to be "general purpose."
[3] Pledges without an associated gift are not counted.

flect the presence of enormous outliers. To reduce the likelihood that outliers drive our results, we take the log of the amount given.[4] In addition, we also estimate our models without the top 1 percent of the observations, and find that the results are essentially unchanged. With respect to the probability of giving, about 56 percent of the giving opportunities result in a donation for general purposes and 14 percent for the athletic program. Donation rates for men and women are fairly similar; 54.9 percent of giving opportunities for men result in a donation for general purposes; for women, the figure is 57.9 percent. The corresponding figures for donations to the athletic program are 14.9 percent for men and 11.2 percent for women.

An important question is how to measure team performance. One's initial inclination might be to use the team's won-loss record. However, many sports (such as golf or track) rarely engage in head-to-head competition, instead competing at invitationals with many teams. Therefore, conference championships seem to be the best measure of a team's performance against rivals. We lag team championships by one year because most athletic gifts are made early in the fiscal (and school) year, prior to the start of most teams' seasons.[5] About 11 percent of the observations are associated with an alumnus's own team winning a conference championship. Men's and women's teams are roughly equally successful, with 11.6 percent of men's observations and 10.7 percent of women's observations associated with conference championships.

Most of the remaining explanatory variables are dichotomous. We include an indicator for whether an alumnus was a varsity athlete as an undergraduate. The literature consistently shows that alumni giving is heavily influenced by the affinity that they develop for their schools

[4] A logarithmic transformation presents problems for observations that take a value of zero. As noted below, we set 164 gifts for general purposes that are greater than zero but less than or equal to $1.00 equal to $1.01. Therefore, observations for which there is no giving are associated with $1, whose logarithm is zero. There are no gift amounts in that range for athletic purposes.

[5] When both current and lagged performance are included, current performance tends to be small and insignificant, while lagged performance maintains its explanatory power. We also investigated specifications in which additional lags of performance were included. No consistent results emerged from this exercise.

as undergraduates, and participation in varsity sports is one way in which such an affinity develops. (See, for example, Clotfelter [2001], Monks [2003].) About 34 percent of our observations are associated with alumni who were varsity athletes (36.9 percent for men and 28.0 percent for women). Perhaps, though, the impact of varsity athletic participation depends on how successful one's team was—being on a perennial loser might not engender the same kind of warm feelings as being part of a winning effort. If so, then performance of an alumnus's team when he or she was an undergraduate should be considered. We therefore augment our model with a series of dichotomous variables that take a value of one if the alumnus's team won its conference championship during his or her freshman, sophomore, junior, and senior years, respectively.

We also include other information about the alumni, including years since graduation, gender, ethnicity, SAT scores, ranking of the candidate by the admissions office when they applied to Anon U, course of study, and post-baccalaureate education.

Following Bristol [1991] and Ehrenberg and Smith [2003], the model has a set of indicators for the general economic environment that might affect giving by all alumni, including the percentage change in the S&P 500, GDP, the unemployment rate, and the maximal marginal personal income tax rate. An alternative strategy to account for such factors would be to include time effects; this is not feasible because some of our specifications include variables that sum to the same value for every individual in a given year.

3.2 Econometric Model

We consider first the question of whether in a given year, athletic performance affects the amounts of money that an alumnus donates for general purposes and to the athletic program.[6] In this context, we face two issues that arise in all studies of donative behavior that use individual

[6] One might argue that causation runs in the other direction--higher donations lead to better performance, through, for example, the purchase of better training equipment. Because we measure how giving in this year is affected by athletic performance in the previous year, this possibility seems unlikely to be important.

data. First, a substantial number of the observations are zero; second, there are a few very large outliers. For example, the three largest gifts in our sample are $3.2, $6.2, and $34.5 million. To address the first issue, we estimate each relationship with a Tobit model, which explicitly accounts for censoring.[7] The second problem suggests that we transform the data to reduce the influence of outliers; we take logarithms. Because the logarithm of zero is not defined, we set the 164 positive gifts for general purposes that were less than or equal to one dollar equal to one dollar and one cent (there were no gifts to athletics in that range).[8] In effect, then, we have censoring at the point where the logarithm of the gift is equal to zero, and can then apply a Tobit model straightforwardly. There is, of course, some arbitrariness to this procedure. To assess its robustness, we also estimate the models in levels, eliminating the top one percent of the observations in order to reduce the impact of outliers. As shown below, the substantive results with respect to the impact of athletic performance variables are not affected.[9]

To estimate the model for athletic giving, we use only the sample of former varsity athletes, as they make the vast majority of gifts to athletics.[10] As stressed above, it is not clear what dimension of athletic performance is most relevant - the alumnus's team when he or she was an undergraduate or the performance of the most visible sports, football and men's basketball. Our specification includes all of these variables on the right hand side.[11] To test whether former ath-

[7] We present Tobit estimates for both giving for general purposes and giving to the athletic program. We do not present Tobit results for total giving as well. This would be logically inconsistent—if the variables Y and Z can both be modeled as Tobits, then Y+Z cannot.

[8] No changes emerge when these observations are simply deleted.

[9] The Tobit estimates allow us to calculate not only the marginal effects of the right hand side variables on the unconditional amount of giving, but also on the probability of being censored, that is, the probability of making a gift. These marginal effects and their standard errors are the same up to a constant of proportionality. In Table 2, that constant is 6.3 for Column (1), 4.5 for Column (2), 6.1 for Column (3), and 3.8 for Column (4).

[10] 21,791 of the 22,797 gifts to the athletic program are from former athletes. Many of the remainder seem to be from alumni parents of current students who are not athletes themselves; we would not expect their giving to react to team performance.

[11] A possible additional measure would be the overall performance of all teams while the alumnus was an undergraduate. However, this variable is collinear with the class effects, so both cannot be included. If we were to include

letes react differently to changes in the football and men's basketball teams' performances, we include an interaction between the indicator for having been a varsity athlete and the performance of football and men's basketball, respectively. We also include the other variables described above: a set of team effects (equal to one if the alumnus was on the associated team, and zero otherwise), a set of the alumnus's personal characteristics, and a set of annual variables that characterize the state of the macroeconomic environment. In addition, the model includes location effects (state or foreign country of residence in that year), and class effects (equal to one if the alumnus graduated in a given year and zero otherwise). The class effects control for common influences on alumni in the same class, such as the political milieu when they were undergraduates, the presence of certain professors or administrators, and so on. Given a Tobit specification, donations for individual i in year t, G_{it}, can be written:

$$G_{it} = max[0, \beta_1 * OwnTeamWon_{i,t-1} + \beta_2 * Basketball_{t-1} + \beta_3 * Football_{t-1} + \beta_4 * Athlete_i * Basketball_{t-1} +$$

$$\beta_6 * Athlete_i * Football_{t-1} + \gamma * UndergradPerformance_i + \theta * Team_i + \delta * X_{it} + \lambda * Class_i + \omega * Year_t],$$

where $OwnTeamWon_{i,t-1}$ equals one if the individual's former team won its conference championship in the prior year, $Basketball_{t-1}$ equals one if the basketball team won its conference championship in the prior year, $Football_{t-1}$ equals one if the football team won its conference championship in the prior year,[12] $Athlete_i$ equals one if the individual was a varsity athlete, $UndergradPerformance_i$ is a vector of dichotomous variables indicating whether the individual's varsity team won its conference championship in each of the years he or she was an undergraduate, *Team, Class and Year* are team, class, and year effects, and X_{it} is a set of personal characteristics, some of which vary with time. The standard errors are adjusted for clustering within individuals.

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overall performance, then we would be attributing all factors unique to a given class's undergraduate experience to athletic performance.

[12] Former members of the football team are only affected through their own-team championship variable; that is, for these alumni OwnTeamWon is equal to one if they won their conference championship, but Football is not. Members of the men's basketball team are treated symmetrically.

A consistent result in the literature is that patterns of charitable giving tend to differ by gender (Andreoni and Vesterlund [2001]). We therefore estimate our models separately for men and women.

4. Results

Table 2 shows our basic results for males (in columns (1) and (2) and females (in columns (3) and (4)) In addition to the variables listed in the tables, the models include the other right hand side variables mentioned in the previous section**,** which are suppressed for brevity.

4.1 Males

Column (1) shows the incremental effects on the log of the amount of giving for general purposes.[13] Marginal effects are calculated at the mean, except for binary variables, for which marginal effects measure the change from 0 to 1. When an alumnus's former team wins a conference championship, his giving increases by a statistically significant 7.0 percent. This strikes us as a quantitatively substantial effect. An interesting question is whether this effect varies by sport, and if so, do "individual" sports like swimming differ from "team" sports like crew. There are no clear patterns among different types of teams. Perhaps this is not surprising. At the end of the day, a team is still the sum of its members, and members of "individual" sports can develop as much loyalty to their teams as members of "team" sports.

We turn next to the performance of the football and basketball teams. We find that the impact of football success does in fact depend on whether the alumnus was formerly an athlete. For non-athletes, the effect is statistically insignificant. For former athletes, the effect is given by the sum of the main effect and the interaction, which is statistically different from zero (p =

[13] Note that the reference group in this case consists of both former athletes whose team did not win a championship and non-athletes. When the reference group is limited to former athletes whose teams were unsuccessful, the coefficient on a conference championship is nearly identical to this figure.

0.019). However, the magnitude of the sum, 0.047, is smaller than the own-team effect. The basketball team's record has a negative effect on the amount given (-2.5 percent) for those who are not former athletes; for former athletes, the magnitude is close to zero and statistically insignificant ($p = 0.68$). These results echo those of Turner, Meserve and Bowen [2001], who found that the magnitude and even sign of the impact of a winning season for a visible team are not robust with respect to choice of sample. They conjecture that when alumni see success among these teams, they may believe that the school is spending too much on the athletic program, and therefore reduce their giving (p. 824). Without taking a strong stance, since the effect is small, we note that such a phenomenon might explain our finding. The last four coefficients in column (1) indicate that the performance of one's team as an undergraduate exerts no statistically discernible impact on the amount of giving for general purposes.

Column (2) shows the results for the log of donations to the athletic program. Giving to athletics increases by about 7.6 percent when an alumnus's former team wins a conference championship. A successful football season has a negative effect, and a successful basketball season has a positive effect. The reasons behind these opposing signs are unclear.

The performance of the alumnus's team as an undergraduate has a substantial effect on the amount of subsequent giving to the athletic program. A conference win in the senior year, for example, increases subsequent giving by 8.0 percent each year. The negative effect of a freshman year conference championship may arise from the pressure that these athletes feel to sustain their success. The four coefficients on undergraduate performance are jointly significant ($p = 0.0019$).

4.2 Females

The results for women are in columns (3) and (4) of Table 2. Reading across the first rows, we see that the coefficients on the own team's record are small and statistically insignificant. The success of an alumna's former team affects neither her giving for general purposes nor to the athletic program. The football team's record has no discernible effect on giving, while a successful basketball season results in small but statistically significant decreases in giving for general purposes. Finally, unlike the case for males, when an alumna's team was successful when she was an undergraduate, it generally has no impact on her subsequent giving to the athletic program. Comparing the first two columns in Table 2 with the second 2 columns, it would be fair to say that athletic performance, both contemporaneous and when the student was an undergraduate, is a less important determinant of giving for women than it is for men.

4.3 Intertemporal Considerations

The coefficients in the first row of Table 2 indicate that, at least for males, the performance of an alumnus's former team in a given year increases his donations that year. Perhaps, though, this merely represents a reallocation of a fixed amount of lifetime giving across time rather than an actual increase in giving. To investigate this possibility, we estimate a cross-sectional analogue to our panel model, with the total present value of lifetime giving as the dependent variable. The total number of wins of the alumnus's own team since graduation is significant, indicating that lifetime giving is increased by athletic success. Thus, our estimates are not just isolating an intertemporal shift in giving.

5. Alternative Specifications

In order to assess the robustness of our results, we estimated a number of alternative specifications of our model.

Removing outliers. As is the case at most universities, a few large gifts account for a disproportionate share of total donations to Anon U. For example, the top one percent of positive gifts for general purposes accounted for 70.1 percent of the total in 2006; the corresponding figure for athletic gifts was 62.3 percent of the total. This raises the possibility that our results are being driven by just a few observations. Our use of logs for the left hand side variables attenuates the impact of outliers, but as another check, we re-estimate the Tobit models with the top one percent of donations in each category deleted from the sample. The results are in Table 3a (columns (1a) and (2a)) for men and Table 3b (columns (1b) and (2b)) for women. When we compare these results to their counterparts in Table 2, we see that the estimates are similar. In particular, the current performance of a former athlete's team has a significantly positive effect on both giving for general purposes and athletic giving for men, but no statistically discernible effect for women. Also, the performance of an alumnus's team when he was an undergraduate increases his subsequent giving to the athletic program, but this is not the case for alumnae.

Levels versus logs. A related question is whether the substantive results would change if we analyzed the level of donations as opposed to the logs. The last two columns of Tables 3a and 3b present the results when the Tobit model is estimated in levels, again deleting the top one percent of the donations in each category. If we compare these results to their counterparts in the first two columns in Tables 3a and 3b, respectively, we see that the signs and patterns of statistical significance are similar. Our qualitative results are not sensitive to the distinction between logs and levels.

Fixed effects and permanent income. A drawback to our data set is that it includes no information on income or wealth. One way to deal with this issue begins with the hypothesis that giving depends on the alumnus's permanent income. If so, then a sensible approach is fixed ef-

fects estimation, which controls for any attributes of an alumnus that do not change over time (or at least over the length of our sample period). Indeed, a fixed effects model takes into account any time-invariant unobservable variables that might drive giving, such as affinity to Anon U, generosity, quality of undergraduate experience, and so on. Estimating fixed effects with Tobit is cumbersome. Therefore, we use ordinary least squares. The results are reported in Table 4. Comparing the results for men to those in Table 2, we see that they are remarkably robust. In particular, the magnitudes of the coefficients on own-team performance are very similar. The impact of football success on giving for general purposes in the fixed effects model is somewhat larger than in Table 2, but the results are still quite close. In the same way, a comparison of Table 2 and the last two columns of Table 4 indicates that fixed effects estimation does not lead to any substantial changes for women. We conclude that unobserved differences across individuals are not driving our results.

Substitution between athletic and general purpose giving. Our specification does not provide a direct way to determine whether athletic giving and giving for general purposes are substitutes. To investigate this issue, we examine the allocation of giving by the subsample of alumni who were varsity athletes and made a positive gift to Anon U in a given year. Specifically, we estimate a regression of the proportion of giving that went to the athletic program on the same right hand side variables as in column (2) of Table 2.[14] For men, the coefficient on own team's record is small but precisely estimated, 0.0151 (s.e. = 0.00284). Thus, if an alumnus's former team wins its conference championship, the proportion of his or her gift that goes to athletics increases by only 1.5 percentage points. For women, the effect is tiny and insignificant (-0.00086, s.e. = 0.00273). The impact of football and men's basketball is significant for both men and women, with football having a negative effect and basketball having a positive effect. The coef-

[14] Because the variable is bounded between zero and one, we use two-limit Tobit estimation.

ficients are fairly small, around one percentage point. With respect to the undergraduate athletic experience, a freshman year conference win for men reduces the proportion going to athletics by 1.5 percentage points (s.e. = 0.00314), while junior and senior year wins are positive and significant, about 1.8 percentage points each. For women, only a junior year conference championship is positive and significant. Thus, conference championships during an alumnus's years as an upperclassman shift the proportion of giving to athletics permanently. But the amounts involved are not substantial--out of a total gift of $100 from a male, winning a conference championship as a senior shifts $1.84 to athletics. We conclude that in our data, shifting between giving for general purposes and the athletic program is not an important phenomenon.

Time varying coefficients. Our specification implicitly assumes that the effect of athletic success does not depend on the passage of time. It is the same regardless of the number of years since the alumnus graduated and regardless of the calendar year. It could be, though, that the influence of the athletic program changes with time. One can imagine affinity to one's team either increasing or decreasing with the passage of years. In the same way, it is possible that because of other changes taking place over time (for example, more televised sports available over cable), the impact of athletics at one's alma mater has changed. To investigate these possibilities, we estimated variants of our basic models in which we interacted the team success variables with years since graduation and with a time trend. We were unable to isolate any robust results with respect to the passage of time on the impact of athletic success for either men or women.

5. Summary and Conclusions

We use data on individual alumni from a selective university to estimate the impact of athletic success upon donative behavior. Previous attempts to analyze this question have relied upon institutional level data; the use of micro data allows us to document the importance of sev-

eral variables that simply cannot be investigated with aggregate data. For example, previous studies have focused on the records of the most visible sports, football and men's basketball. Our data allow us to examine the impact of the team on which the alumnus participated. We find that football and men's basketball are less important as determinants of giving than the success of an alumnus's own team. Moreover, among former male athletes, donations to the athletic program depend on the success of the alumnus's team when he was an undergraduate.

Of course, using data from a single institution comes with a price: it is not clear whether our results would generalize to other schools. In particular, at schools with more visible football and basketball programs, the effects of success for those teams might be larger and more robust. That said, there is no reason to believe that former athletes at such institutions fail to develop an affinity for their own teams—our results on the importance of own-team championships could very well generalize. To the extent that this is true and universities care about turning their undergraduates into future donors, it would seem that universities should nurture broad varsity athletic programs. To the contrary, though, many schools have been cutting less visible men's teams in order to focus more closely on football.[15] Hence, examining the degree to which our findings generalize to, for example, large state universities with popular football programs, is an important subject for future research.

[15] See, for example,Vegosen [2007].

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Table 1*
Variable Definitions and Summary Statistics

Variable	Description	Mean	Standard Deviation
DidGenlGive	1 if any donation for general purposes given in year	0.5595	0.4965
DidAthGive**	1 if any donation for athletic purposes given in year	0.1388	0.3458
GenlGive	Total giving for non-athletic purposes for year in 2006 dollars	507.0	53670
AthGive**	Total giving for athletic purposes for year in 2006 dollars	57.32	1921
LogGenlGive	Log of non-athletic giving in year in 2006 dollars	2.486	2.455
LogAthGive**	Log of athletic giving in year in 2006 dollars	0.6427	1.657
OwnTeamRec***	1 if the alumnus's own team won the conference championship in the previous year	0.1126	0.3161
FootballRec	1 if the football team won the conference championship in the previous year, unless the alumnus was a football player	0.114	0.317
BasketballRec	1 if the men's basketball team won the conference championship in the previous year, unless the alumnus was a male basketball player	0.443	0.497
FreshmanRec	1 if the alumnus's team won the conference championship during the alumnus's freshman year	0.08098	0.2728
SophomoreRec	1 if the alumnus's team won the conference championship during the alumnus's sophomore year	0.08365	0.2769
JuniorRec	1 if the alumnus's team won the conference championship during the alumnus's junior year	0.08573	0.2800
SeniorRec	1 if the alumnus's team won the conference championship during the alumnus's senior year	0.09199	0.2890
Athlete	1 if the alumnus played a varsity sport	0.3366	0.4726
Basketball	1 if the alumnus was a member of the men's basketball team	0.01497	0.1214
Baseball	1 if the alumnus was a member of the baseball team	0.01627	0.1265
Hvycrew	1 if the alumnus was a member of the men's heavyweight crew team	0.02579	0.1585
Lightcrew	1 if the alumnus was a member of the men's lightweight crew team	0.02225	0.1475
Xcteam	1 if the alumnus was a member of men's cross country team	0.01079	0.1033
Fencing	1 if the alumnus was a member of the men's fencing team	0.01407	0.1178
Football	1 if the alumnus was a member of the football team	0.05169	0.2214
Golf	1 if the alumnus was a member of the men's golf team	0.00725	0.08481
Icehockey	1 if the alumnus was a member of the men's ice hockey team	0.01351	0.1155
Lacrosse	1 if the alumnus was a member of the men's lacrosse team	0.02069	0.1424

Soccer	1 if the alumnus was a member of the men's soccer team	0.01591	0.1251
Squash	1 if the alumnus was a member of the men's squash team	0.01105	0.1045
Swimteam	1 if the alumnus was a member of the men's swim team	0.01286	0.1127
Tennis	1 if the alumnus was a member of the men's tennis team	0.01132	0.1058
Track	1 if the alumnus was a member of the men's track team	0.02216	0.1472
Volleyball	1 if the alumnus was a member of the men's volleyball team	0.00263	0.05123
Waterpolo	1 if the alumnus was a member of the water polo team	0.00201	0.04476
Wrestling	1 if the alumnus was a member of the wrestling team	0.01039	0.1014
Wbasketball	1 if the alumna was a member of the women's basketball team	0.00545	0.07359
Wxcteam	1 if the alumna was a member of the women's cross country team	0.00655	0.0807
Fieldhockey	1 if the alumna was a member of the field hockey team	0.01210	0.1093
Wfencing	1 if the alumna was a member of the women's fencing team	0.00381	0.06164
Wgolf	1 if the alumna was a member of the women's golf team	0.00072	0.02687
Wicehockey	1 if the alumna was a member of the women's ice hockey team	0.00590	0.07658
Wlightcrew	1 if the alumna was a member of the women's lightweight crew team	0.00131	0.03622
Wopencrew	1 if the alumna was a member of the women's open crew team	0.01722	0.1301
Wlacrosse	1 if the alumna was a member of the women's lacrosse team	0.01413	0.1180
Wsoccer	1 if the alumna was a member of the women's soccer team	0.00914	0.09515
Softball	1 if the alumna was a member of the softball team	0.00435	0.06584
Wsquash	1 if the alumna was a member of the women's squash team	0.00622	0.07860
Wswimteam	1 if the alumna was a member of the women's swim team	0.0091	0.09496
Wtennis	1 if the alumna was a member of the women's tennis team	0.00930	0.09596
Wtrack	1 if the alumna was a member of the women's track team	0.01297	0.1132
Wvlyball	1 if the alumna was a member of the women's volleyball team	0.00730	0.08514
Wwaterpolo	1 if the alumna was a member of the women's water polo team	0.0015	0.03871
Yearssince	Number of years since graduation	12.55	7.557
Yearssince2	Number of years since graduation, squared	214.6	230.4
Spouseisalum	1 if the spouse is an alumnus	0.1348	0.3415
Male	1 if the alumnus is male	0.6528	0.4761
Race/Ethnicity			
White	Omitted Category: 1 if the alumnus is White	0.8407	0.3660

Amerind	1 if the alumnus is a Native American	0.00333	0.05759
Black	1 if the alumnus is Black	0.06033	0.2381
Hispanic	1 if the alumnus is Hispanic	0.03610	0.1865
Asian	1 if the alumnus is Asian	0.06292	0.2428
Secondary Schooling			
Public	Omitted Category: 1 if the alumnus attended public school	0.5747	0.4944
Boarding	1 if the alumnus attended boarding school	0.1407	0.3477
Private	1 if the alumnus attended private school	0.2673	0.4425
Schloth	1 if the alumnus attended another type of school	0.01737	0.1306
SATmath	SAT math score. Scores prior to 1996 are adjusted to reflect re-centering of the scoring scale.	703.2	75.49
SATverbal	SAT verbal score. Scores prior to 1996 are adjusted to reflect recentering of the scoring scale.	702.2	75.10
Admissions Office "Non-Academic" Ranking	Omitted Category: 1 if the alumnus received the highest non-academic ranking from the admissions office	0.03378	0.1807
A			
B	1 if the alumnus received the second highest non-academic ranking from the admissions office	0.4798	0.4996
C	1 if the alumnus received the third highest non-academic ranking from the admissions office	0.4087	0.4916
D	1 if the alumnus received the fourth highest non-academic ranking from the admissions office	0.07395	0.2617
E	1 if the alumnus received the fifth highest non-academic ranking from the admissions office	0.00381	0.06159
Admissions Office "Academic" Ranking	Omitted Category: 1 if the alumnus received the highest academic ranking from the admissions office	0.1501	0.3572
A			
B	1 if the alumnus received the second highest academic ranking from the admissions office	0.4262	0.4945
C	1 if the alumnus received the third highest academic ranking from the admissions office	0.2727	0.4453
D	1 if the alumnus received the fourth highest academic ranking from the admissions office	0.1432	0.3503
E	1 if the alumnus received the fifth highest academic ranking from the admissions office	0.00784	0.08817
Clubsport	1 if the alumnus played on a club team	0.1222	0.3275

Honors	1 if the alumnus graduated *magna*, *summa*, or *cum laude*	0.4571	0.4982
Greek	1 if the alumnus was a member of a fraternity or sorority	0.7405	0.4383
Major Molbio	Omitted Category: 1 if the alumnus majored in molecular biology	0.02179	0.1460
Small Social Science	1 if the alumnus majored in Anthropology, Urban Studies, or Sociology.	0.02849	0.1664
English	1 if the alumnus majored in English	0.1097	0.3126
Economics	1 if the alumnus majored in Economics	0.08041	0.2719
Public Policy	1 if the alumnus majored in Public Policy	0.06041	0.2382
Political Science	1 if the alumnus majored in Political Science	0.08731	0.2823
Psychology	1 if the alumnus majored in Psychology	0.04767	0.2131
History	1 if the alumnus majored in History	0.1207	0.3258
MAE	1 if the alumnus majored in Mechanical/Aerospace Engineering	0.03569	0.1855
EE/CS	1 if the alumnus majored in Electrical Engineering or Computer Science	0.05383	0.2257
Arch & Civ	1 if the alumnus majored in Architecture or Civil Engineering	0.07145	0.2576
Small Humanities	1 if the alumnus majored in Art, Art History, Classics, East Asian Studies, Linguistics, Music, Near Eastern Studies, Philosophy, Religion, or Languages and Literature departments	0.1149	0.3189
Small Engineering	1 if the alumnus majored in “Engineering”, Operations Research and Financial Engineering, or Chemical Engineering	0.03085	0.1729
Small Sciences	1 if the alumnus majored in Applied Mathematics, Astrophysics, Biochemistry, Biology, Chemistry, Ecology and Evolutionary Biology, Geology, Mathematics, Physics, or Statistics	0.1367	0.3436
Minor No Minor	Omitted Category: 1 if the alumnus received no minor	0.7856	0.4104
African/African-American Studies	1 if the alumnus received a minor in African or African-American Studies	0.02007	0.1402
American Studies	1 if the alumnus received a minor in American Studies	0.02385	0.1526
Latin	1 if the alumnus received a minor in Latin	0.00153	0.03913
Finance	1 if the alumnus received a minor in Finance	0.00232	0.04812
Theater	1 if the alumnus received a minor in Theater	0.0132	0.1141
Public Policy	1 if the alumnus received a minor in Public Policy	0.05176	0.2215
Other Engineering	1 if the alumnus received a minor in Architecture, Basic Engineering, Bioengineering, Electrical Engineering, Geological Engineering, Management, Materials Sciences, or Robotics.	0.01869	0.1354

Other Sciences	1 if the alumnus received a minor in Applied and Computational Mathematics, Biophysics, Cognitive Studies, Environmental Studies, Science in Human Affairs, or Neuroscience.	0.02694	0.1619
Other Humanities	1 if the alumnus received a minor in a humanities field	0.05208	0.2222
Teaching	1 if the alumnus received a teaching certificate	0.01358	0.1157
Reunion	1 if the year after graduation is some multiple of 5	0.1889	0.3914
Post Baccalaureate Education			
NoPostAB	Omitted Category: 1 if the alumnus has no advanced degree	0.5246	0.4994
PhD	1 if the alumnus has a Ph.D. or equivalent degree	0.06743	0.2508
Masters	1 if the alumnus has a masters	0.1413	0.3483
JD	1 if the alumnus has a JD	0.1060	0.3078
MDDDS	1 if the alumnus has a medical degree	0.06399	0.2447
MBA	1 if the alumnus has an MBA	0.09670	0.2956
Annual Variables[†]			
SPChange	Percent change in the S&P 500 index	0.09854	0.1538
Election	1 if a presidential election year	0.2565	0.4367
GDP	Gross domestic product in billions of 2000 dollars	8745	1654
Unemp	Unemployment rate	5.654	1.154
TopRate	Maximum personal income tax rate	0.3794	0.04490

*Except where otherwise noted, figures are based on 449,909 observations on gift-giving from 1983 to 2006. 30,822 alumni who graduated from 1972 to 2004 are represented. We set gifts for general purposes that are greater than zero but less than or equal to $1.00 equal to $1.01. Therefore, observations for which there is no giving are associated with $1, whose logarithm is zero.
**Based only on the sample of alumni athletes. There are 150,923 observations on gift-giving from 1983 to 2006. 10,774 alumni athletes who graduated from 1972 to 2004 are represented.
***The variables in this block are defined over the entire sample. Hence, a value of zero occurs either if an individual was not a varsity athlete or the individual was a varsity athlete and his or her team did not win a conference championship.
[†]These variables are based on annual data. The figures presented here weight the annual values by the number of observations in each year.

Table 2*
Determinants of Giving for General Purposes and for the Athletic Program

	Males		**Females**	
Variable	**(1) Amount of gift for general purposes (logs)**	**(2) Amount of gift to the athletic program (logs)**	**(3) Amount of gift for general purposes (logs)**	**(4) Amount of gift to the athletic program (logs)**
Own team's record	*0.07031* *(0.01735)*	*0.07638* *(0.01056)*	-0.00535 (0.02543)	-0.00627 (0.01422)
Football team's record	0.01360 (0.01383)	*-0.03966* *(0.01374)*	-0.02053 (0.01701)	-0.04224 (0.04281)
Athlete* Football team's record	0.03473 (0.02719)	-	0.02647 (0.03592)	-
Basketball team's record	*-0.02503* *(0.01042)*	*0.04460* *(0.00793)*	*-0.03858* *(0.01191)*	0.02239 (0.0214)
Athlete * Basketball team's record	0.02515 (0.02205)	-	0.04732 (0.02911)	-
Freshman Year Conference Win	-0.07597 (0.063)	*-0.07797* *(0.03238)*	0.1408 (0.07784)	0.04961 (0.05245)
Sophomore Year Conference Win	0.07111 (0.06401)	0.03152 (0.03533)	0.03201 (0.08037)	0.00496 (0.03021)
Junior Year Conference Win	0.04129 (0.06437)	0.06772 (0.0378)	-0.08784 (0.07641)	0.07775 (0.07559)
Senior Year Conference Win	0.02301 (0.06268)	*0.08098* *(0.03548)*	0.00814 (0.07333)	-0.00287 (0.02781)

* Columns (1) and (3) show the incremental effects on the logarithm of amount of the gift in a given year for general purposes for men and women, respectively. Columns (2) and (4) show the incremental effects on the logarithm of amount of the gift to the athletic program for men and women, respectively. The figures are marginal effects generated by a Tobit model. Columns (1) is based on the overall male sample of 293,683 observations, while column (3) uses the overall female sample of 156,226 observations. Columns (2) uses the male athlete-only sample, with 107,946 observations, while columns (4) uses the female athlete-only sample, with 42,978 observations. The figures in parentheses are standard errors; coefficients that are statistically significant at the 5% level are italicized. Standard errors are adjusted for clustering based on individuals. In addition to the variables listed, the regressions include the variables listed in the Appendix, as well as team effects, location effects, and class effects, which are not reported for brevity. Full results are available upon request.

Table 3a*
Determinants of Giving for General Purposes and for the Athletic Program (Males)
(Top One Percent of Donations in Each Category Omitted from Sample)

Variable	(1a) Amount of gift for general purposes (logs)	(2a) Amount of gift to the athletic program (logs)	(3a) Amount of gift for general purposes (levels)	(4a) Amount of gift to the athletic program (levels)
Own team's record	*0.06152* *(0.01672)*	*0.07461* *(0.0104)*	*7.335* *(2.749)*	*4.972* *(0.7028)*
Football team's record	0.01309 (0.01338)	*-0.04172* *(0.01356)*	0.4856 (2.012)	*-2.029* *(0.8359)*
Athlete* Football team's record	0.03999 (0.0261)	-	6.195 (3.963)	-
Basketball team's record	*-0.02765* *(0.01)*	*0.04306* *(0.00784)*	0.6403 (1.536)	*2.947* *(0.5130)*
Athlete * Basketball team's record	0.02881 (0.02101)	-	-0.2286 (3.048)	-
Freshman Year Conference Win	-0.07925 (0.05884)	*-0.07827* *(0.03177)*	-7.535 (7.704)	*-5.083* *(2.014)*
Sophomore Year Conference Win	0.05095 (0.05979)	0.02527 (0.03459)	3.462 (7.647)	2.483 (2.315)
Junior Year Conference Win	0.03563 (0.06051)	0.06802 (0.0372)	8.107 (7.999)	4.058 (2.356)
Senior Year Conference Win	0.00778 (0.05899)	*0.07972* *(0.03491)*	0.8286 (7.736)	*5.630* *(2.300)*

Table 3b*
Determinants of Giving for General Purposes and for the Athletic Program (Females)
(Top One Percent of Donations in Each Category Omitted from Sample)

Variable	(1b) Amount of gift for general purposes (logs)	(2b) Amount of gift to the athletic program (logs)	(3b) Amount of gift for general purposes (levels)	(4b) Amount of gift to the athletic program (levels)
Own team's record	-0.00614 (0.02404)	-0.00778 (0.01491)	-0.5058 (2.180)	-0.4879 (0.8509)
Football team's record	-0.00311 (0.01624)	-0.0414 (0.04215)	-0.7120 (1.414)	-1.886 (2.111)
Athlete* Football team's record	0.01691 (0.03338)	-	5.963 (3.171)	-
Basketball team's record	*-0.03857* *(0.0113)*	0.02172 (0.02091)	*-2.955* *(1.077)*	1.065 (1.122)
Athlete * Basketball team's record	0.04266 (0.02701)	-	*5.011* *(2.491)*	-
Freshman Year Conference Win	0.13102 (0.07169)	0.05017 (0.05257)	8.216 (6.143)	3.002 (3.305)
Sophomore Year Conference Win	0.01368 (0.07407)	0.00358 (0.02957)	6.820 (6.836)	1.270 (1.983)
Junior Year Conference Win	-0.06768 (0.07103)	0.07387 (0.07236)	-4.938 (6.480)	2.489 (2.867)
Senior Year Conference Win	0.00039 (0.06835)	-0.00269 (0.02742)	0.8622 (6.053)	0.5888 (1.479)

*The estimates in this table remove the top one percent of the positive gifts given to the athletic program and the top one percent of the positive gifts for general purposes. Columns (1a and b) and (2a and b) show the incremental effects on the logarithm of amount of the gift in a given year for general purposes and to the athletic program, respectively. Columns (3a and b) and (4a and b) show the incremental effects on the dollar amount of gifts made in a given year for general purposes and to the athletic program, respectively. All results report marginal effects generated by a Tobit model. Columns (1a) and (3a) use the overall male sample of 291,987 observations, while columns (1b) and (3b) use the overall female sample of 155,292 observations. Columns (2a) and (4a) use the male athlete-only sample, with 107,785 observations, while columns (2b) and (4b) use the female athlete-only sample, with 42,931 observations. The figures in parentheses are standard errors; coefficients that are statistically significant at the 5% level are italicized. Standard errors are adjusted for clustering based on individuals. In addition to the variables listed, the regressions include the variables listed in Table 1, team effects, location effects, and class effects, which are not reported for brevity. Full results are available upon request.

Table 4*
Fixed Effects Estimates

	Males		**Females**	
Variable	**(1) Amount of gift for general purposes (logs)**	**(2) Amount of gift to the athletic program (logs)**	**(3) Amount of gift for general purposes (logs)**	**(4) Amount of gift to the athletic program (logs)**
Own team's record	*0.06913* *(0.01300)*	*0.06711* *(0.01046)*	0.01583 (0.01815)	0.01883 (0.01338)
Football team's record	*0.02485* *(0.01243)*	-0.0253 (0.01465)	-0.00357 (0.01564)	*-0.0564* *(0.01927)*
Athlete* Football team's record	-0.01299 (0.02156)	-	-0.04187 (0.02861)	-
Basketball team's record	-0.00651 (0.00800)	*0.05571* *(0.009)*	-0.01435 (0.00970)	*0.03497* *(0.01205)*
Athlete * Basketball team's record	-0.01013 (0.01352)	-	-0.01814 (0.01801)	-

* Columns (1) and (3) shows the incremental effects on the logarithm of amount of the gift in a given year for general purposes for males and females, respectively. Columns (2) and (4) shows the incremental effects on the logarithm of amount of the gift to the athletic program. All columns report marginal effects generated by ordinary least squares with fixed effects. Column (1) is based on the overall male sample of 293,683 observations, while column (3) uses the overall female sample of 156,226 observations. Column (2) uses the male athlete-only sample, with 107,946 observations, while column (4) uses the female athlete-only sample, with 42,978 observations. The figures in parentheses are standard errors; coefficients that are statistically significant at the 5% level are italicized. Standard errors are adjusted for clustering based on individuals. In addition to the variables listed, the regressions include years since graduation and its quadratic, an indicator for reunion year and the time-varying annual variables listed in Table 1, which are not reported for brevity. Full results are available upon request.