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The Impact of Winning an NCAA Men's Basketball or Football Championship on Academic Quality

Eggers F. Eggers
Appalachian State University

Peter A. Groothuis
Appalachian State University

Abstract

Collegiate sports programs are often characterized as the front porch of a university, serving to publicize the institution and draw students to the door. We analyze how winning either a national championship in men's NCAA Division One basketball or football influences the academic quality of students attending the university. Our findings suggest that winning a national championship in men's basketball slightly increases the quality of students at a university, while winning a football championship slightly lowers the quality of students who enroll at a school as measured by academic test scores and high school rank. Our results demonstrate that winning a national championship may serve as signal to prospective students of the amenity mix available at a university, thereby influencing student enrollment decisions.

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Contact: Eggers F. Eggers - eggersaf@appstate.edu, Peter A. Groothuis - groothuispa@appstate.edu.

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1. Introduction

University athletic programs serve as a visible and accessible connection between a school and the general public. Members of the public and potential students could view a school's athletic successes as a signal regarding the overall quality of the university. This association between sports and education helps to explain why institutions of higher learning invest significant monetary resources in athletics as opposed to more traditionally academic endeavors. This concept is supported by Jacob, McCall and Stange (2018) who found that students place a high value on consumption amenities, such as sports, student activities, and dormitories. In their view, universities serve as country clubs that not only provide academics, but also use consumption amenities to entice students to attend the school. In particular, they find that heterogeneity in student preferences account for the variation of academic amenity spending across universities. These different preferences have led some institutions to attract students to enroll by offering football and basketball programs that enhance the student experience.

Our study examines the impact of winning a Division One men's basketball or football national championship on a university's student academic profile. Unlike previous studies, we focus on how winning a championship influences the distribution of student quality among various achievement categories, as opposed to simply examining mean or median test scores. Our research question is not examining the marginal impact of winning a men's basketball or football national championship. Instead, our research question follows more of an event study framework and questions how the event of winning a national championship in basketball or football serves as a proxy for extreme university athletic prowess by measuring the extent to which students across academic quality distributions care about those characteristics of a university. We find there is a slight positive effect on the student profile at a school in terms of student quality following an NCAA men's basketball championship, while there is a slight negative effect on student quality following a football championship.

2. Related Literature

The impact of athletics at a university has a long history in economics. Baade and Sundberg (1996) found that a postseason bowl game appearance by a university's football team increased alumni giving; however, Turner et al. (2002) noted that improvement in a team's football win to loss record did not increase alumni giving at private universities. Humphreys (2006) discerned that when a university fields a "big-time" college football program, state appropriations increase. Goidel and Hamilton (2006), in a survey of the general public, found that a majority of individuals think that athletic success and academic quality at a school are positively connected, an idea which was later supported by Trenkamp (2009) who examined subjective factors to determine whether academic rankings were influenced by athletic success. Clotfelter (2015) also found that diehard fans are linked to a university more by state residence than school attendance. Further, Fisher (2009) and Mulholland, Tomic and Scholander (2014) established that NCAA football success increased peer assessment scores as ranked by US News and World Report College Rankings, while Cox and Roden (2010) also found that US News and World Report Rankings increased for universities who won either a football or basketball championship.

Focusing on students currently attending a university, Mixon and Trevino (2002) observed a positive and significant relationship between a universities' winning percentage in

football and overall graduation rates. Tucker (2004) also noted that having a highly successful football team positively impacted overall graduation rates and increased alumni giving; however, the same study also indicated that having a successful basketball team does not significantly impact either of these measures. Alternatively, Lindo, Swensen and Waddell (2012) and Hernandez-Julian and Rotthoff (2014) both observed that athletic success in football lowers students' academic performance during a successful season. Additionally, White, Cowan and Wooten (2017) analyzed student's alcohol consumption and found that drinking increased when their university team participates in the NCAA postseason basketball tournament. These findings suggest that university athletics can have both a positive and negative impact at a university.

There has also been a significant amount of research focusing on the influence of athletic success on future student enrollment and academic quality. Baumer and Zimbalist (2019) found that a successful football program at a university is associated with more applicants to the school, while Murphy and Trandel (1994) observed that an improvement in a school's football winning percentage also increased the number of applications a school receives. Mixon (1995) noted that athletics play a positive role within the mission of higher education by attracting higher quality students to a school. Chressanthis and Grimes (1993) further discerned that enrollment rises and falls with the success of a school's football program. Toma and Cross (1998) analyzed the effects of winning an NCAA National Championship in football or men's basketball on the number of applications submitted to a school, and found a significant positive increase in applications after the championship. Their study was the first to claim that college athletics are a "front-door" to a university because sports are one of the only aspects of an institution that reach outside the academic world. Pope and Pope (2009) measured athletic success in terms of playoff berths and found that a school's success in football or men's basketball is often accompanied by an increase of 2% to 8% in applications received. Similarly, Jones' (2009) study observed that simply appearing in a Bowl Game caused an increase in applications received and admission yield at a school. Interestingly, this increase was only found for male students, while the admission yield for both male and female students were positively correlated with the Nielsen Rating of the Bowl Game.

Mixon, Trevino and Minto (2004) also found a positive and significant relationship between football win percentage and applications received, supporting the idea that collegiate football impacts an institution's admissions profile. McEvoy (2005) found a positive relationship between the number of applicants at a university and a winning football team, but did not find the same significance with men's or women's basketball success. Smith (2009) observed that prolonged success in athletics is much more beneficial for a university than a single upset win or the acute advertising effect brought about by a playoff berth or bowl game appearance. His contention is that continued athletic success leads to a more solid sports culture at a school, and therefore a higher perceived quality of the institution. More recently, Anderson (2017) using a propensity score approach, found that universities who performed better than expected in football saw an increase in applications, enrollment and donations. Collier et al. (2020) noted a "Cinderella Effect" in men's basketball for private schools when they experience unexpected success in the NCAA March Madness tournament, suggesting that unexpected athletic success has an impact on student enrollment decisions. Lastly, Eggers et al. (2019 and 2020) found that athletic malfeasances, as measured by post season bowl bans in football and tournament bans in basketball, lowered applications and enrollment at the infracting universities.

Focusing on student academic quality, Caudill, Hourican, and Mixon (2018) ascertained that when a university eliminates a football team, their applicant pool shrinks and their American

College Testing (ACT) scores fall. Further, McCormick and Tinsley (1987) found that a winning football season increased in the incoming year's freshman SAT scores. Segura and Willner (2018), focusing on football Bowl Game invitations, noted that Bowl Game invitations served to increase the median SAT scores at the participating universities. Conversely, Smith (2008) discerned that Division One basketball success does not influence enrollment decisions among the proportion of students from the top ten percent of their class or the proportion of National Merit Scholars attending the university. Additionally, Tucker and Amato (2006) found there is no consistent evidence to suggest a highly successful basketball team influences average Scholastic Assessment Test (SAT) scores. Pope and Pope (2014), further studying SAT scores, determined that when a university has a stellar year in either football or basketball, the total number of test scores sent to that university increased by ten percent but there was no effect on student enrollment. They additionally determined that Black students, male students and students who played sports in high school are more influenced by athletic success. Lastly, Chung (2013) focused on SAT score distributions and found that lower than average SAT scoring students have an increased preference for athletic success than do high achieving SAT students. Overall, the literature suggests that the success of a football or basketball program has some influence on both the quantity and academic quality of students who choose to attend a university.

3. Data and Methods

To test the impact of winning a national championship in either men's basketball or football on the academic quality of incoming students at a university, we use data from 119 Division I (FBS, formally D-1A) schools from 2000 to 2013, or a fourteen year panel. This sample represents all schools from the Atlantic Coast Conference (ACC), the Big 12 Conference, the Big 10 Conference, Conference U.S.A., the Mid-American Conference (MAC) , the Mountain West Conference, The PAC 12, the Southeastern Conference (SEC) , the Sun Belt Conference, the and the Western Athletic Conference. In Table 1, we list the national champions by year and note that during the time of our study there was no championship tournament in football, so some years have multiple champions identified using various methods.

Table 1: List of NCAA Men's Football and Basketball Champions

Year of Championship	Basketball University	Football University*
2000	Michigan State	Oklahoma, Miami (Florida)
2001	Duke	Miami (Florida)
2002	Maryland	Ohio State, USC
2003	Syracuse	LSU, Oklahoma, USC
2004	Connecticut	USC
2005	North Carolina	Texas
2006	Florida	Florida, Ohio State
2007	Florida	LSU, Missouri, USC
2008	Kansas	Florida, Utah
2009	North Carolina	Alabama
2010	Duke	Auburn, TCU
2011	Connecticut	Alabama, LSU, Oklahoma State
2012	Kentucky	Alabama, Notre Dame

* These champions are named by various College Football selectors

To control for team quality by year, we include the win percentages of both football and men's basketball. To control for school resources, we include the college endowment. For our dependent variables, we use data from the Peterson Undergraduate Data Set, which provides our measure of academic quality. We examine student academic quality at these universities as measured by the percentage of the incoming freshman class that were ranked in the top ten percent of their high school class, and how these students scored on both the math and verbal sections of the SAT and ACT academic achievement tests. We report the means and standard deviation of both the dependent and independent variables in Table 2. The average football and basketball win percentage is higher than .500 because we focus only on the top conferences in the NCAA who often play schools in smaller conferences not included in the dataset. The average endowment at the schools included in our study is $958 million.

Table 2: Means and Proportions

Variables	Percent of Freshman Class (Standard deviation)	Percentile
SAT Math Score (700-800)	13.3% (16.7)	92nd and above
SAT Math Score (600-700)	28.2% (16.4)	75th to 91st
SAT Math Score (500-600)	28.5% (16.7)	41st to 75th
SAT Math Score (400-500)	13.6% (12.9)	1st to 40th
Total SAT Math	85.8% (34.9)	1st to 100th
SAT Verbal Score (700-800)	9.8% (13.1)	94th and above
SAT Verbal Score (600-700)	25.1% (15.9)	73rd to 93rd
SAT Verbal Score (500-600)	31.2% (16.8)	39th to 72nd
SAT Verbal Score (400-500)	16.0% (13.7)	1st to 38th
Total SAT Verbal	85.0% (35.7)	1st to 100th
ACT Score (30-36)	13.5% (17.5)	93rd and above
ACT Score (24-29)	34.7% (18.7)	73rd to 92st
ACT Score (18-23)	32.5% (21.4)	38th to 72th
ACT Score (12-17)	5.7% (8.1)	11th to 37th
Total ACT	86.4% (34.3)	1st to 100th
Top 10% High School	34% (25)	
Basketball Win Percentage	.562 (.168)	
Football Win Percentage	.515 (.224)	
Endowment	$958m (213m)	

In Table 2, we also report the dependent variables for various student quality measures. For both math and verbal SAT scores, our quality measures are the percentage of students who enroll at a university from each of the one-hundred-point ranges on the test. On the math portion of the SAT, our data shows that on average thirteen percent of a university's students scored above the 92nd percentile, or earned a score of between 700 to 800. Twenty-eight percent of those students scored in the 600 to 700 range, or the 75th to 91st percentile. Another twenty-eight percent of students scored between 500 and 600, in the 41st to 74th percentile. About fourteen percent of students scored in the 400 to 500 range, or the 1st to 40th percentile range. Overall, eighty-six percent of students in our dataset reported a score on the math section of the SAT.

For SAT verbal scores, our data shows that about ten percent of a university's students scored above the 94th percentile, or a score of between 700 and 800. Twenty-five percent of students scored in the 600 to 700 range, the 73rd to 93rd percentile. Thirty-one percent scored between 500 and 600, or in the 39th to 72th percentile, while roughly sixteen percent scored in the 400 to 500 range, in the 1st to 38th percentile range. Overall, eighty-five percent of the students in our dataset reported an SAT verbal score.

When examining ACT scores, thirteen percent of students reported scores from the 93rd and above percentile, or a score of 30 to 36 on the ACT. Thirty-five percent of students reported scores from the 73rd to 92nd category, a score of 24 to 29, while thirty-two percent reported scores of 18 to 23, in the 72nd to 37th percentile of test takers. Lastly, six percent of students reported an ACT test score of 12 to 17, or in the 11th to 37th percentile. Overall, eighty-six percent of students reported an ACT score. We further measure student academic quality by examining an incoming student's high school class rank. Our data indicates that roughly thirty-four percent of enrollees at the universities studied came from the top-ten percent of their high school class.

To further analyze the influence of winning a men's basketball or football national championship on a university's academic profile, we use the fixed effect regression technique. This technique controls for differences between universities over time. Using this method, we analyze how winning a championship influences the quality of students enrolled at these institutions. The university fixed effect controls for all university characteristics that are time invariant, including whether the school is religious, private or public. The year fixed effect also control for the changing demographics of students and macro-economic conditions that change over time. In addition to the fixed effect regression technique, we further cluster the standard errors by university. The strength of this technique allows us to capture the transitory effect of winning a national championship, where the permanent aspects of this event are captured in the fixed effect.

The model we estimate is listed below, where Championship is a dummy variable equal to one if university won the championship and t* is the year of the championship.

$$Yit = \beta_0 + B_1 * Basketball\ Winning\ Percentage_t + B_2 * Basketball\ Championship_{t^*} + B_3 * Basketball\ Championship_{t^*-1} + B_4 * Basketball\ Championship_{t^*-2} + B_1 * Football\ Winning\ Percentage_t + B_2 * Football\ Championship_{t^*} + B_3 * Football\ Championship_{t^*-1} + B_4 * Football\ Championship_{t^*-2} + Bi * University_i + Bt * Year_t + \varepsilon_{it}$$

4. Results

We report the results of winning a men's basketball or football national championship on a university's academic profile in Tables 3 through 5. In Tables 3 and 4, we report the impact of winning an NCAA national championship on the quality of freshman students enrolled at a university by focusing on the student's verbal and quantitative SAT Scores. We find that winning a basketball national championship has no effect on the percentage of top achieving students who enroll at a university. These students are identified as individuals who scored over 700 on the verbal or mathematical portions of the SAT test. However, we do find that winning a championship increases the percentage of students at a university who earned between a 600 and 700 on the verbal SAT by two and a half percentage points both one and two years after the championship victory. Alternatively, winning a football championship has no effect on the enrollment of high academic achieving students; however, a football championship does increase the enrollment of average achieving students who scored between a 500 and 600 on the SAT.

Table 3: Verbal SAT Scores

Variable	Verbal SAT Over 700	Verbal SAT 600-700	Verbal SAT 500-600	Verbal SAT 400-500
Basketball Win Percentage	.106 (.766)	-.448 (1.760)	-1.039 (2.287)	-.403 (1.821)
Basketball Champion	.347 (.538)	1.420 (1.069)	.036 (1.854)	.047 (.449)
Lag1: Basketball Champion	.099 (.749)	2.364* (1.478)	-.374 (1.486)	-.062 (.483)
Lag2: Basketball Champion	-.021 (.662)	2.841** (1.125)	-.835 (1.833)	-.797 (.752)
Football Win Percentage	.105 (.721)	1.524 (1.3120	1.173 (1.907)	1.197 (1.566)
Football Champion	-2.18 (2.287)	-2.370 (2.957)	-.037 (2.454)	-.195 (1.235)
Lag1: Football Champion	.761 (1.016)	.253 (1.849)	3.494* (1.982)	.885 (1.184)
Lag2: Football Champion	.466 (1.163)	1.250 (2.047)	2.540 (2.519)	.618 (1.296)
Endowment	.0004 (.0004)	-.0001 (.0003)	-.0001 (.0003)	-.0002 (.0002)
Constant	8.128** (.784)	22.969** (1.341)	31.189** (1.572)	15.327** (1.262)
R-squared Within Between Overall	 .083 .515 .217	 .038 .003 .004	 .019 .013 .009	 .019 .013 .009

Schools=119 Years=13 Fixed effects by university and year. Clustered Standard errors in parentheses. *significant at 90% level **significant at 95% level

Table 4: Math SAT Scores

Variable	Math SAT Over 700	Math SAT 600-700	Math SAT 500-600	Math SAT 400-500
Basketball Win Percentage	-.886 (1.012)	-.985 (1.717)	-1.953 (2.139)	-.581 (1.559)
Basketball Champion	.191 (.774)	1.980 (1.501)	.231 (1.648)	-.139 (.380)
Lag1: Basketball Champion	.672 (.608)	1.804 (1.748)	-.457 (.921)	-.129 (.295)
Lag2: Basketball Champion	1.079 (.741)	.568 (1.360)	-.553 (1.457)	-.057 (.521)
Football Win Percentage	.121 (.899)	.735 (1.266)	1.213 (1.860)	.901 (1.530)
Football Champion	-3.654 (2.934)	-.828 (3.202)	-.502 (2.277)	.382 (1.231)
Lag1: Football Champion	-.727 (1.152)	2.091 (2.167)	3.363* (2.228)	.382 (1.231)
Lag2: Football Champion	-.531 (1.241)	1.935 (2.005)	2.793 (2.830)	.547 (.954)
Endowment	.0013** (.0004)	-.0007* (.0003)	-.0005** (.0002)	-.0003 (.0002)
Constant	10.982** (.785)	26.659** (1.421)	28.232** (1.647)	16.160** (1.262)
R-squared Within Between Overall	 .156 .502 .350	 .073 .019 .001	 .021 .097 .050	 .016 .097 .035

Schools=119 Years=13 Fixed effects by university and year. Clustered Standard errors in parentheses. *significant at 90% level **significant at 95% level

We find no other changes in enrollment for students who earned in the lower test scoring category of 400 to 500 for either basketball or football. This effect is consistent for both the verbal and mathematical portions of the SAT. Our results show that winning a national championship in men's basketball increases the number of students enrolling at a university who scored between the 75th to 90th percentiles on the SAT exam, while winning a national championship in football increases the number of students who earned between the 40th and 75th percentile on the SAT exam.

Table 5: ACT Scores and High School Rank

Variable	ACT Score (30-36)	ACT Score (24-29)	ACT Score (18-23)	ACT Score (12-17)	High School Top 10%
Basketball Win Percentage	-3.051 (2.584)	-.168 (2.488)	-3.607* (1.955)	-.873 (.766)	-1.112 (1.944)
Basketball Champion	1.841 (1.319)	-3.522 (3.336)	-2.956* (1.583)	-.385 (.347)	8.869* (3.272)
Lag1: Basketball Champion	2.186 (1.411)	1.768 (3.338)	1.277 (1.983)	-.071 (.383)	-.561 (2.503)
Lag2: Basketball Champion	2.053* (1.261)	-1.652 (2.710)	.953 (1.771)	.284 (.345)	-9.047 (9.346)
Football Win Percentage	-2.397 (2.141)	-.315 (2.306)	-.849 (1.987)	-.022 (.768)	-3.598** (1.737)
Football Champion	-5.722 (4.270)	2.130 (3.040)	-.478 (1.300)	-.139 (.279)	-3.617 (4.034)
Lag1: Football Champion	-2.737 (1.974)	2.449 (2.189	-.095 (1.762)	-.176 (.227)	-4.471 (3.474)
Lag2: Football Champion	-2.541 (1.919)	1.468 (1.642)	.119 (2.021)	-.069 (.241)	-5.539* (3.069)
Endowment	.0009 (.0007)	-.0008 (.0005)	-.0001 (.0001)	.0002 (.0001)	.0005 (.0005)
Constant	13.500** (2.082)	32.494** (2.060)	36.878** (1.350)	7.034** (.559)	31.784** (1.284)
R-squared Within Between Overall	 .157 .022 .014	 .068 .002 .015	 .056 .019 .016	 .078 .040 .002	 .086 .017 .026

Schools=119 Years=13 Fixed effects by university and year. Clustered Standard errors in parentheses. *significant at 90% level **significant at 95% level

In Table 5, we report the results for students who took the ACT and then enrolled at a national championship university. We find that winning a championship in basketball increases the enrollment among top achieving students, those students earned between a 30 and 36, or the 93rd percentile and above, on the ACT exam by 2 percentage points. This effect occurs two years after the championship. However, winning a championship in basketball lowers the attendance of students at a school who earned between 18 and 23 (or in the 38th to 72nd percentile) by three percentage points the year of the championship. In addition, we find that winning a national championship in men's basketball increases the enrollment of students who are in the top ten percent of their high school class by 8 percentage points the year after the championship.

Winning a football championship, however, has no effect on the enrollment of students from any category of the ACT exam, but winning a football championship serves to lower the

percentage of students who scored in the top ten percent of their high school class by five percentage points two years after the football championship. Overall, our results demonstrate that winning a national championship in men's basketball slightly increases the academic quality of students attending the university, while winning a national championship in football slightly decreases the academic quality of students attending the university.

5. Discussion and Conclusion

Our findings suggest that winning an NCAA men's basketball championship in Division One men's basketball slightly increases the academic quality of incoming students at a school as measured by test scores and high school rank. Conversely, our findings further suggest that winning an NCAA football championship in the Division One Bowl Subdivision serves to slightly decrease the academic quality of incoming students as measured by high school rank. These conflicting results challenge the theory that athletic success serves as a signal for university quality by drawing more academically qualified students to the university, and instead strengthens the premise that a university is seen more like a country club, offering a mix of amenities that appeal to heterogeneous students. Ultimately, the minor impact on student quality brought about by winning either a basketball or football national championship appears to contradict the idea that athletic success substantially enhances a university's student academic profile as measured by SAT scores, ACT scores or high school rank.

These relatively modest changes in student quality detected by our analysis are possibly due to the fact that all the NCAA men's basketball or football champions in our dataset are known to be some of the top basketball and football programs in the nation. Therefore, much of the effect of athletic success at these schools could potentially be captured in the university fixed effect. However, because the schools in our dataset are known to be high achieving basketball or football schools, the modest changes in academic quality found at these institutions following an NCAA championship is informative by indicting how athletic success can change the academic profile of a university.

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