The Impact of Collegiate Athletic Success and Scandals on Admissions Applications

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Abstract

This paper examines how the quantity and quality of admissions applications to Division 1 colleges and universities were affected by two non-academic factors: (1) performance of a school's men's basketball and football teams; and (2) scandals associated with these athletic programs. Admissions data from 2001 – 2017 were compared to team performance during their football and basketball seasons in order to understand how these non-academic factors contribute to an individual's decisions to apply for admission. A multivariate linear regression model with school and year fixed effects supported the hypothesis that athletic success positively affects the quantity of applications, increasing them by up to 3% in basketball and 11% in football in the following application period. Seasonal football success was also shown to have negative impacts on the distribution of standardized testing scores of future applicant classes, however these scores were shown to increase when a team played their best season in five or more years. Additional analysis of the effects of athletic program scandals reveals a significant negative effect on the number of applications received, although a deep dive into a few of the most prominent scandals suggests that the benefits associated with violating NCAA rules may, under the right circumstances, be well worth the risk.

I.   Introduction

In recent years, collegiate athletics have found their place alongside professional sports as staples of American entertainment. In 2018, the NCAA Football Championship Game drew 28.4 million viewers, more than any other sporting event that year except the Super Bowl. In the same year, the March Madness men's basketball tournament generated more viewership and revenue than any other sporting post-season, with over 100 million viewers from 180 countries tuning in throughout the three weeks of play (Figure 1). Collegiate teams in these two sports provide their schools with the unique opportunity for international publicity in a non-academic context, which begs the question: how are these schools affected by this worldwide popularity and the spotlight of ongoing international media scrutiny, particularly in a time of 24-hour news cycles and robust social media?

Effects such as increased athletic revenue and better athletic recruiting classes are clear, but researchers have begun to analyze the effect that athletic success may have on admissions applications, and ultimately on academic quality. Tucker et al. (1993) first considered this in their paper *Does Big- time Success in Football or Basketball Affect SAT Scores?* They ultimately determined that football success was positively correlated with an increase in SAT scores in the following application period. This research sparked an ongoing wave of analyses of athletic and other non-academic factors that may contribute to increasingly-competitive freshman classes. This paper aims to build upon the conclusions first presented by Tucker et al. in 1993, as well as provide an updated perspective to this problem by considering additional factors such as basketball performance and athletics scandals.

To date, the research on the impact of athletic programs on applications is marked by two major themes. First, it is almost exclusively focused on collegiate football. Football is the biggest college sport many times over by revenue and viewership. In fact, the average collegiate football

team brings in more revenue ($31.9 million) than the next 35 teams' average combined (Gaines and Nudelman, 2017), with basketball the clear number two at $8.2 million. Past studies have proven or referenced the positive correlation between a successful football program and both quantity and quality of admissions applications (e.g. McCormick and Tinsley (1987), Tucker and Amato (1993), Siegelman and Brookheimer (1983), Rhodes and Gerking (2000), and Baade and Sundberg (1994)). However, the significant gap in this research in recent years paired with the lack of non-football variables under consideration provide ample room for contribution within this field. In his 2010 article *Anomalies in Tournament Design*, Robert Baumann acknowledged that "while numerous studies have demonstrated positive effects of football success on applications... Systematic proof of basketball's effect on admissions has proven more elusive." This paper looks to fill in part of this gap and to provide updated analyses regarding the effects that football success has on admissions applications.

The second theme is that the independent variables analyzed are largely macro factors that reflect year-over-year success, such as head-coach win percentage or number of national championships won, rather than individual seasonal success or lack thereof. This work will therefore provide a more detailed analysis than those that have come before it by considering the impacts that a single season's team performance can have on applications.

Additionally, my work will also take in to consideration novel factors such as the presence of athletics scandals and superstars, which may play a significant role in this relationship. This will provide a more complete and accurate understanding of the athletics-related factors that influence students' decisions about applying to a given school and will shed light on the degree to which they value each of these factors individually and as a whole.

In addition to these two themes, it is also apparent that the current research on this subject suffers from dating, as the most referenced papers were published in the late 90s and early 2000s.

With the increasing popularity and ever-changing nature of athletics, as well as the evolving media and entertainment landscapes, it is important to reconsider previous conclusions from a modern perspective in order to ensure that they have not lost accuracy with age.

In order to analyze this relationship, I will look at the impact that college basketball and football success, or lack thereof, has on both the quantity and quality of applications to that school. The dependent variables, quality and quantity of applications, will be represented by the number of applicants received and their standardized testing score distributions. While test scores are clearly a limited and imperfect way to determine the quality of applicants, they are the most objective data available. This information is released by schools and consolidated following each application period (roughly November – March).

The independent variables in this analysis will encompass the seasonal performance of a both a school's basketball and football teams. Additionally, I investigate the effects of athletics scandals and the resulting NCAA investigations on applications. These effects have only been previously studied on an individual basis for the most significant scandals, and never in an academic context. Including these effects in to my analysis will help answer questions about the risks to a school's reputation that come as a result of fielding sports teams.

I use a linear regression model with school and year fixed effects to illuminate the causal impacts of athletics on institutions of varying size and quality. This analysis was facilitated by, but also acts as a complement to, the previous football-centric work in this field and will help shed light on whether this literature was subject to omitted-variable bias by due to the lack of basketball and scandal variables in their models. I am able to compare my results with those offered in previous literature to understand how the passing of time and the consideration of basketball affect the outcomes of this relationship.

Given the massive audiences garnered by the basketball tournament and football bowl games, I hypothesize a positive correlation between athletic success in these contexts and the quantity, but not the quality, of applications received during the following admissions cycle. This hypothesis is rooted in the idea that these events act as advertising for their institutions for millions of spectators, including many potential applicants and their families, but that the applicants that choose to apply to a school as a result of athletic success are not of notably higher or lower quality than their peers. These individuals may note a school's performance in athletics and apply for admission for several reasons. They may look forward to the entertainment provided by athletics or want to be associated with a famous or widely-admired institution. They also may equate athletic success with overall school quality as well as the promise of future performance. There is evidence for both of these connections in literature surrounding collegiate football success, and this paper will quantitatively draw additional conclusions with the new perspectives of basketball and athletics scandals.

This is an important and relevant question to tackle given the increasing attention and scrutiny that collegiate athletic programs are receiving, and I hope that my work will be able to shed light on questions such as how these sports fit in to the college and university system in the United States, and what their future may hold.

Section 2 of this paper will briefly review the previous literature that analyzes the impacts of collegiate sports on admissions applications. Sections 3 and 4 describe the data and empirical methodology used to complete the analysis. Section 5 presents the results, while section 6 discusses them and places them within the context of previous work. Section 7 provides a deeper analysis of the impacts that athletic scandals have on their institutions. Section 8 concludes the work.

II.   Literature Review

The idea of analyzing the impact of college sports on admissions applications is not a novel one. There have been many articles and research studies done that consider this very idea. This section outlines how my work differs from those of previous authors and explains what areas of knowledge I either address for the first time or am building upon.

The most conclusive and frequently-cited paper in this field is Devin and Jaren Pope's *The Impact of College Sports Success on the Quantity and Quality of Student Applications* (2009). The Pope brothers do consider basketball success in their work, but limit their analyses to the small number of "top programs" in both football and basketball. Their work combines a great deal of previous research with their new analyses to create four key findings:

> (1) football and basketball success significantly increases the quantity of applications to a school, with estimates ranging from 2% to 8% for the top 20 football schools and the top 16 basketball schools each year; (2) private schools see increases in application rates after sports success that are two to four times higher than public schools; (3) the extra applications received are composed of both low- and high-SAT-scoring students, thus providing potential for schools to improve their admission outcomes; and (4) schools appear to exploit these increases in applications by improving both the number and the quality of incoming students.

While Pope's investigation is both exhaustive and substantial, it suffers most severely from dating. Although the paper is ten years old, they used data from 1983 to 2002. Given that my years of focus are 2001 to 2017, only 2 years will overlap between our works, presenting the opportunity for an updated and more detailed analysis of what factors most significantly drive applications, and how they may have changed since this paper was published.

Robert Baumann's *Anomalies of Tournament Design* (2010) is one of the few papers that addresses the relationship between applications and basketball. Baumann devotes most of the paper to discussing the incentives for a team to perform well during the regular season in order to receive a higher seed in the tournament, and whether or not the current seeding system is in fact the most equitable and rewarding for the schools. He discusses how teams naturally want to make it farther in the tournament, and that one of the added benefits of doing so is publicity that may increase "both the number and the quality of applicants to the school as well as inducing higher alumni giving." This is the only basketball-related-application conclusion made by Baumann in the paper, and he later notes that while this topic has been explored for football, there exists a great gap with respect to basketball.

In the paper referenced in the above quotation, McEvoy (2005) investigates the "relationship between dramatic changes in NCAA Division I-A intercollegiate athletics team performance and undergraduate admissions applications." McEvoy considers all collegiate Division 1 sports, but finds that only football's winning percentage has a statistically-significant relationship with the number of applicants to a school. McEvoy's model considered only the change in win percentage from year to year of a given school's athletic team. Additionally, in the 13 years since this paper was published, much has changed in the world and in collegiate sports. Specifically, the emergence of smart phones and the increased accessibility of news and media has helped their enthusiastic and growing audiences and fandoms access and share information about them more easily and frequently than ever before. I therefore suggest that this study is both dated and limited in its methodology of a largely-macro analysis of factors that may be influencing applications to a given school.

Robert Goidel's (2006) *Strengthening Higher Education Through Gridiron Success* addresses the question of how football team performance motivates students to apply to a school.

Goidel observes a relationship between a school's athletic success and perceived academic quality. He concludes that "a substantial proportion of the population believes that athletic success and academic quality are connected," but that "less-educated respondents are more likely to make such connections." This conclusion suggests that the distribution of standardized testing scores may be negatively affected by the additional applicants that are applying to a school as a result of athletic success, and it will be interesting to compare this conclusion with my own given the thirteen years that have passed since Goidel published his work.

No research exists that addresses the impact of athletics scandals on admissions applications.

My analysis will both use and build upon the existing research on the effects of athletic successes on applications, and I will take in to considerations factors that have grown in significance in recent years, such as the media buzz around a team, and the "superstar" effect that individual players can have. My work will focus on single-season factors that affect to both the quantity and quality of applications in order to contribute to an understanding of the key drivers – both small and large – that affect this relationship.

III.   Data

The dependent variables in this analysis will be yearly admissions data for each Division 1 school. This information for each application season can be found as a subset of the yearly datasets published by the Integrated Postsecondary Education Data System (IPEDS). This organization collects and compiles data on hundreds of aspects of each school and reports their findings annually. They receive their data from the National Center for Education Statistics, and most of the previous literature on this subject worked with datasets derived or taken directly from the IPEDS.

The most relevant data points for this paper from the IPEDS dataset are application numbers, along with their gender breakdowns, and the standardized testing scores for these applicants. Each school reports the number of male and female applications they receive in a given year, as well as the 25th and 75th percentiles for either or both of the SAT and ACT composite scores. These variables can be cleaned and consolidated for each school in order to determine how they change year-over-year in the presence or absence of athletic success.

Two distinct complications arise with the IPEDS data that must be tackled before an analysis can begin. Firstly, IPEDS data dates back to 2001, which presents the issue that from 2005 – 2016, the SAT was scored out of 2400 instead of the previous and current 1600. The need for consistent measures first requires the conversion of all of these scores to base 1600. Secondly, not every school has data for both their SAT and ACT scores. This created the need to develop a methodology for comparing scores between the two exams.

Both of these complications were address by utilizing the CollegeBoard concordance tables. These are tables that are published every year aimed at "establishing a relationship between scores on assessments that measure similar (but not identical) constructs" (CollegeBoard, 2018). They outline, for each distinct SAT and ACT score, what the corresponding ACT and SAT scores are respectively given the distribution of performance on both exams in each given year. These tables also offer conversion rates from the base-2400 SAT to both the base-1600 SAT and the ACT. I therefore was able to convert each SAT composite score from each year in to an ACT score by utilizing each year's concordance table, and use ACT composite score as the singular dependent variable concerning quality of the applicant class.

Previous studies have not considered how athletics may affect male and female applications differently, making this perspective a novel one and important focus of my work. It

will be interesting to see if and how different levels of success, as well as athletics scandals, impact the genders in different ways, and whether these impacts are consistent with how the two genders view and follow sports in general.

Given that most of what people remember from a given season is determined by how a school finished the season, the main basketball independent variables will be the men's team's performance in the March Madness Tournament, and the football variables will be the final Associated Press (AP) rank of each team with the exception of the national champion and runner-up. Men's basketball tournament data was pulled from a project done by *The Washington Post* that contained the complete history of March Madness, and the football AP Poll data was retrieved from the Associated Press website.

I choose to use tournament performance rather than AP Poll rankings for basketball variables in order to capture the impact on applications of each incremental round in the tournament rather than simply just the objectively "best" 25 teams each year. A large aspect to the "madness" of the tournament is the fact that the most successful teams from the regular season often are not the final 8 or 4 teams remaining in the bracket; however, the teams that make it further are remembered more vividly by the audience given their exposure through more rounds and days of the tournament. The unique design to the college basketball postseason lends itself well to analysis of this kind, and I will therefore be using tournament performance as a measure for men's basketball success rather than AP poll ranking, as I will for football.

Including any higher-level variables such as points per game, strength of schedule, upset performance, and player efficiency would be problematic given that they would likely be both less explanatory and highly correlated with the variables previously mentioned. Therefore, given that they are likely less important, they will not be included in the regressions due to multicollinearity. This unfortunately will make it difficult to capture individual phenomena, such

as when in the 2018 NCAA men's tournament, UMBC was the first ever 16 seeded team to upset a number 1 seeded team in the first round. This was a monumental win for the school, but it is difficult to create a variable that would capture such victories while at the same time avoiding bias so as to not hinder the accuracy of the others.

The third set of independent variables that I will consider are athletics scandals such as those at the University of Louisville in 2015, University of North Carolina in 2014 and University of Southern California in 2011. Collecting data on these scandals and others is difficult- what constitutes a scandal? Can we factor in the severity of the scandal?

To begin, I found a list of Wikipedia pages under the category "College athletic controversaries in the United States" (Wikipedia). Wikipedia organizes pages such as these under broader umbrellas within their filing system, and because there is no objective way to determine what is and isn't a "scandal" amongst the hundreds of NCAA investigations, I chose this admittedly-imperfect starting point because each of these events received enough attention to warrant its own page on the site. Wikipedia listed 48 scandals on this page spanning 63 years, with 33 of the 48 scandals occurring within the 17 years of my dataset (2001–2017). This supports the idea that the increased accessibility to information and media in recent years has had unique impacts on athletics, as these entities have facilitated information around these scandals to spread much quicker and further than they would have in the past.

Each of these scandals was coded in to their respective schools within the dataset in the year in which they were uncovered. Most of these events took place over the course of several years, though they were not made public until sometime after the violations began. This methodology will allow me to capture the effects of media attention to these scandals on applications.

During my analysis, I will take into account a lagged effect that all of these factors may have on applications. These lagged variables will capture the residual impact that a given level of athletic success, or lack thereof, has on the application period *following* the one directly after the end of a sporting season. This is done in previous research (Pope, 2009), and helps to provide an understanding of how the passing of time impacts the relationship between athletic success and admissions applications. Additionally, performance in a given season is likely a rough indicator of both expectations and performance in seasons to come, even in light of the frequent "one and done" elite players in men's basketball.

There are 129 Division One (D1) schools that have both men's basketball and football teams spanning 17 years of applications from 2001-2017 within the dataset. Although there are more D1 men's basketball teams than there are football, in order to look at the impacts of both sports simultaneously on their respective schools the dataset must only consider those that have both. It is also the case that, for the most part, the schools that do the best in the men's basketball tournament also have a D1 football team, as evidence by the fact that within these years they made up 220 of the 272 teams that advanced past the 2nd round of the tournament and all but one champion (Villanova). This presents over 2,000 observations from which to draw statistical conclusions about the impact of athletic success and scandals on applications to a given school.

IV.   Empirical Specification

My analysis will use regression models with school and year fixed effects in order to isolate and understand the impact of athletics on the number and quality of applications to a given school i in time t. The first step in doing this is to create year and institution dummy variables to capture the natural change in admissions over time, roughly a 6% increase year-over-year, and to have the ability to control for nuances such as location, size, quality and

reputation of each unique school within the dataset. Tables will be included in the appendix to display the models without the inclusion of the year fixed effects so as to highlight the potential omitted-variable bias that would exist without them.

The panel data design establishes different baselines (intercepts) for each school in each year of the data. This will provide a model that explains much more of the variation in the dependent variables than would a traditional linear model. Additionally, variables such as applications and enrollment that depend greatly on the size of a school will be transformed by taking their natural logarithm in order to deal with heteroskedasticity and to remove the bias that, for example, a 2% increase in applications is a much bigger number for a school that typically receives 30,00 applicants than receives 5,000.

Standardized test scores provide the most objective measure of the overall quality of an incoming class to a school. As explained before, I will look at ACT composite scores that were either reported by the school or transformed from the corresponding SAT score for schools that did not report ACT data. The dataset specifically posts the 25th and 75th percentiles of these scores, and I will therefore regress the athletics variables on to both of these metrics to understand how they affect both the floor and ceiling of the quality of applications.

The coding and representation of these athletic variables are important to explain. For the basketball variables, given that 64 teams make the tournament every year (not including losing play-in teams), the lowest metric for a successful season can be represented by teams that made the tournament. Meeting this bar puts the schools on the radars of the millions of spectators and individuals who watch this first round and/or choose to fill out their own brackets. With this as a baseline, it is important to then capture the marginal impact of each consecutive round that a team makes in the tournament. This will help explain what kind of effect that each incremental degree of success has on a school, from the round of 64 up until the championship game.

Schools will therefore be coded as the furthest round that they made but did not advance from. This methodology ensures that there is not perfect collinearity between, for example, making the final four and making the elite eight. Additionally, I pair together the rounds of 64 and 32, as well as rounds of 16 and 8, yielding five distinct "levels" that a team can achieve each year in the tournament: losing in the round of 64 or 32, losing in the round of 16 or 8, losing in the final four, losing in the championship game (the runner-up), and winning the championship. We can then interpret the coefficients on the first three levels as the marginal impact of making it to a given round and no further, and the final two as the impact of losing and winning in the championship game.

The football variables were coded similarly, but with different metrics. Given that there has only recently emerged a college football playoff, and only includes four teams, the best way to capture seasonal football performance for a given school is through their end-of-season Associated Press (AP) ranking. The AP publishes the top 20 teams in the country at the end of each season. However, in some instances the winner and loser of the national championship game do not represent numbers 1 and 2 in the poll, so additional indicators were created to capture the team that won and lost in each championship game.

Five categories were therefore created to capture the varying levels of success that a given team had in a football season. The indicators were: teams #20 - #11 (Top 20), #10 - #6 (Top 10), #5 - #3 (Top 5), the runner-up and the champion. For similar reasons to those mentioned above, it could not be a pure Top 20, Top 10, Top 5, #2 and #1 given that indicators for each consecutive level would then be perfectly correlated with the indicators for the previous levels. These categories were used, rather than using rankings directly, so as to not fix the difference between each ranking and to give more data points in each group.

A single indicator variable was given to a team if that team was home to the Heisman trophy winner in a given year. Although in every year in the dataset with the exception of 2016 (Lamar Jackson at Louisville) the Heisman winner was also a member of a team in the final AP poll, the Heisman schools are roughly evenly distributed across the 5 categories coded above, removing the risk of multicollinearity.

Finally, two variables were created to indicate whether a team had exceeded its best football or basketball "level" of performance within the last five or more years. This can be understood as whether a team made it further in the tournament, or whether it achieved a better AP Poll ranking, than it had within the previous five years of play, inclusive of the year in question. This variable was designed to capture the effect of a team's performing above its recent historical average, making their performance more noteworthy, and likely garnering more media attention, than those of more dynastic competitors. Finally, an indicator variable was created to signal whether a school was exposed in an athletics scandal in a given year.

As explained earlier, for all of the previously-mentioned variables I created identical indicators within the dataset except with one year of lag. So, for example, Duke University's row for the 2015 year indicates that Duke won the national championship, but also that in 2014 it lost in the Round of 64. This was done for each variable in the dataset to understand the residual effect that any given success might have on a school in the application period following the one directly after a given season.

With the understanding and coding of the athletic indicator variables, it was next important to consider the timing associated with the seasons of both of these sports and the application periods that would likely first be affected. The NCAA basketball season begins in early November, and ends in early April, while the NCAA football season begins in late August and ends in early January. The college application season can begin as early as late November,

but most applications are due in early January, with January 1 being the most common deadline. Given that this is directly following the end of the football regular season and prior to the championship game, as well as only in the early stages of the basketball season, it is unlikely that either sports have a significant impact on where students apply until the application season in the fall following their conclusions. For this reason, for example, the 2014-2015 football and basketball seasons will be regressed on to the 2015-2016 application season. This is consistent with previous literature (Pope, 2001).

In order to begin the regressions, dummy variables were created for each year and school except one. I then performed the two regression models below on the admission's dependent variables. Considering this relationship with and without lagged effects is important in understand how the passing of time influences the effects of these regressors, as well as what a single vs multi-year snapshot of this relationship looks like. $X_{i,t}$ represents the dependent variables outlined above - the log of applications (total, male, and female) and composite ACT score 25th and 75th percentiles:

(1) $X_{i,t} = Round64/32_{i,t} + Round16/8_{i,t} + Final4_{i,t} + RunnerUp_{i,t} + BBChampion_{i,t} + BestBBSeasonin5_{i,t} + FBTop20_{i,t} + FBTop10_{i,t} + FBTop5_{i,t} + FBRunnerUp_{i,t} + FBChamp_{i,t} + BestFBSeasonin5_{i,t} + Heisman_{i,t} + AthleticScandal_{i,t} + \sum_{t=2002}^{2017} YearDummy_t + \sum_{i=2}^{129} SchoolDummy_i + \varepsilon_{i,t}$
   a. Regression without lagged variables

(2) $X_{i,t} = Round64/32_{i,t} + Round64/32Lag1_{i,t} + Round16/8_{i,t} + Round16/8Lag1_{i,t} + Final4_{i,t} + Final4Lag1_{i,t} + RunnerUp_{i,t} + RunnerUpLag1_{i,t} + BBChampion_{i,t} + BBChampionLag1_{i,t} + BestBBSeasonin5_{i,t} + BestBBSeasonin5Lag1_{i,t} + FBTop20_{i,t} + FBTop10_{i,t} + FBTop5_{i,t} + FBRunnerUp_{i,t} + FBChamp_{i,t} FBTop20Lag1_{i,t} + FBTop10Lag1_{i,t} + FBTop5Lag1_{i,t} + FBRunnerUpLag1_{i,t} + FBChampLag1_{i,t} + BestFBSeasonin5_{i,t} + BestFBSeasonin5Lag1_{i,t} + Heisman_{i,t} + HeismanLag1_{i,t} + AthleticScandal_{i,t} + AthleticScandalLag1_{i,t} + \sum_{t=2002}^{2017} YearDummy_t + \sum_{i=2}^{129} SchoolDummy_i + \varepsilon_{i,t}$
   a. Regression with lagged variables

V.   Results

This section presents the findings from the running equations (1) and (2) above. The coefficients in these tables can be interpreted as the marginal increase to the dependent variable (natural log of applications in Table 1 and composite ACT score in Table 2) as a result of each of the athletic variables listed in the in the leftmost column.

Starting with a look at application quantity, Table 1 presents results of running equations 1 and 2 on the natural logarithm of total, male and female applications.

Table 1: Effect of Athletics on the Quantity of Admissions Applications

			Log Applications			
	Total	Male	Female	Total	Male	Female
Round of 64 / 32	-0.025**	-0.020*	-0.030***	-0.029**	-0.026**	-0.031***
	(0.011)	(0.012)	(0.011)	(0.012)	(0.012)	(0.012)
Sweet 16 / Elite 8	-0.022	-0.015	-0.028	-0.025	-0.020	-0.028
	(0.018)	(0.019)	(0.018)	(0.018)	(0.019)	(0.019)
Final 4	-0.039	-0.045	-0.034	-0.041	-0.051	-0.032
	(0.035)	(0.037)	(0.036)	(0.036)	(0.038)	(0.037)
BB Runner-up	-0.073	-0.068	-0.080	-0.070	-0.068	-0.075
	(0.049)	(0.051)	(0.050)	(0.050)	(0.051)	(0.050)
BB Champ	-0.005	-0.0002	-0.009	-0.014	-0.013	-0.015
	(0.048)	(0.050)	(0.049)	(0.049)	(0.051)	(0.050)
Best BB Season in 5 Years	0.023	0.020	0.027*	0.029*	0.027	0.030*
	(0.016)	(0.016)	(0.016)	(0.016)	(0.017)	(0.016)
Round of 64 / 32_Lag				-0.005	-0.0003	-0.009
				(0.011)	(0.012)	(0.012)
Sweet 16 / Elite 8_Lag				0.014	0.024	0.006
				(0.019)	(0.019)	(0.019)
Final 4_Lag				-0.004	-0.011	0.001
				(0.036)	(0.037)	(0.037)
BB Runner-up_Lag				-0.014	-0.012	-0.017
				(0.049)	(0.050)	(0.050)
BB Champ_Lag				0.045	0.035	0.053
				(0.047)	(0.049)	(0.048)
Best BB Season in 5 Years_Lag				0.010	0.011	0.008
				(0.016)	(0.016)	(0.016)
FB 11-20	0.044***	0.047***	0.043***	0.029*	0.031*	0.028*
	(0.016)	(0.016)	(0.016)	(0.016)	(0.017)	(0.016)
FB 6-10	0.071***	0.081***	0.063***	0.051**	0.059**	0.044*
	(0.022)	(0.023)	(0.022)	(0.022)	(0.023)	(0.023)
FB 3-5	0.068**	0.069**	0.065**	0.042	0.042	0.040
	(0.027)	(0.028)	(0.027)	(0.027)	(0.028)	(0.028)
FB Runner-up	0.053	0.049	0.057	0.034	0.031	0.037
	(0.045)	(0.046)	(0.045)	(0.047)	(0.048)	(0.048)
FB Champ	0.126***	0.117**	0.133***	0.107**	0.097**	0.115**
	(0.046)	(0.047)	(0.046)	(0.047)	(0.048)	(0.047)
Best FB Season in 5 Years	-0.031	-0.024	-0.035*	-0.009	-0.001	-0.014
	(0.021)	(0.021)	(0.021)	(0.021)	(0.022)	(0.022)
Heisman	0.036	0.033	0.039	0.023	0.021	0.025
	(0.047)	(0.049)	(0.048)	(0.048)	(0.049)	(0.048)
FB 11-20_Lag				0.035**	0.042***	0.029*
				(0.015)	(0.016)	(0.016)
FB 6-10_Lag				0.051**	0.057**	0.045**
				(0.022)	(0.023)	(0.022)
FB 3-5_Lag				0.032	0.033	0.029
				(0.027)	(0.028)	(0.027)
FB Runner-up_Lag				0.047	0.046	0.047
				(0.045)	(0.046)	(0.045)
FB Champ_Lag				0.096**	0.087*	0.100**
				(0.047)	(0.048)	(0.048)
Best FB Season in 5 Years_Lag				0.025	0.033	0.022
				(0.021)	(0.022)	(0.022)
Heisman_Lag				-0.028	-0.029	-0.026
				(0.048)	(0.050)	(0.049)
Athletics Scandal	-0.063**	-0.076**	-0.052*	-0.064**	-0.079**	-0.053*
	(0.031)	(0.032)	(0.031)	(0.031)	(0.032)	(0.031)
Athletics Scandal_Lag				-0.073**	-0.085***	-0.063**
				(0.031)	(0.032)	(0.032)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2016	2016	2016	2016	2016	2016
R^2	0.949	0.950	0.950	0.950	0.951	0.951
Adjusted-R^2	0.945	0.945	0.946	0.946	0.946	0.946

Note: Standard error in parentheses. * = significant at the 10% level; ** = significant at the 5% level; *** = significant at the 1% level

The minimal significance of most of the basketball success indicators is immediately apparent. We see a negative impact on all applications as a result of losing in either of the first two rounds of the tournament, and a positive effect on female applications of a team's surviving in the tournament longer than it had in the past five or more years. However, all other indicators of success are insignificant.

The variables concerning football success carry much more significance. Winning the football championship as well as finishing within the top 20 or top 10 in the AP Poll all bring positive impacts on the quantity of applications in the present and the future time periods, and finishing within top 5 has significance in the absence of lagged effects. We do not see any relationship between winning the Heisman trophy (an indicator for having a football superstar) on applications; however, we do see a statistically-significant negative impact of an athletics scandals on both male and female applications.

Interpreting the variables on this table is not straightforward as the dependent variable is the natural logarithm of applications. However, given that the coefficients are relatively small, their magnitudes are approximately the percent increase in the number applications to a school following the presence of their indicators. For example, if a team finishes within the top 20 football schools, they experience roughly a 2.9% increase to their applications in the following admissions cycle, and a 3.5% increase in the cycle after that, all else equal.

More precisely, taking, for example, a school that in the absence of any of the indicators above would receive 10,000 applications, finishing within the top 20 in the final football AP Poll would yield them $e^{\ln(10,000) + 0.029} = 10,294$ applicants in the following application period.

Turning now to analyze the effects of athletics on the quality of applications to a school, Table 2 shows the results of running regressions (1) and (2) on the composite ACT score 25th and

75th percentiles both with and without the lag variables. The average ACT score is a 20.8, and the maximum is a 36.

Table 2: Effect of Athletics on the Quality of Admissions Applications

	ACT Composite Score			
	25th Percentile	75th Percentile	25th Percentile	75th Percentile
Round of 64 / 32	-0.013	-0.013	-0.008	-0.029
	(0.058)	(0.051)	(0.060)	(0.053)
Sweet 16 / Elite 8	0.090	0.025	0.095	0.025
	(0.092)	(0.081)	(0.094)	(0.083)
Final 4	-0.109	0.080	-0.067	0.086
	(0.180)	(0.158)	(0.186)	(0.164)
BB Runner-up	-0.069	-0.109	-0.065	-0.150
	(0.243)	(0.214)	(0.246)	(0.217)
BB Champ	0.271	-0.134	0.226	-0.188
	(0.263)	(0.232)	(0.268)	(0.236)
Best BB Season in 5 Years	-0.001	-0.049	-0.001	-0.035
	(0.080)	(0.071)	(0.083)	(0.073)
Round of 64 / 32_Lag			-0.045	0.025
			(0.059)	(0.052)
Sweet 16 / Elite 8_Lag			-0.048	0.081
			(0.097)	(0.085)
Final 4_Lag			0.133	0.277*
			(0.185)	(0.163)
BB Runner-up_Lag			-0.259	-0.108
			(0.249)	(0.219)
BB Champ_Lag			-0.099	-0.071
			(0.248)	(0.219)
Best BB Season in 5 Years_Lag			0.104	0.004
			(0.082)	(0.072)
FB 11-20	-0.228***	-0.068	-0.285***	-0.088
	(0.083)	(0.073)	(0.086)	(0.076)
FB 6-10	0.002	0.010	-0.026	-0.027
	(0.112)	(0.099)	(0.116)	(0.102)
FB 3-5	-0.279**	-0.150	-0.355**	-0.242*
	(0.137)	(0.121)	(0.142)	(0.125)
FB Runner-up	0.028	0.301	0.036	0.206
	(0.225)	(0.198)	(0.236)	(0.208)
FB Champ	-0.336	0.052	-0.384*	0.056
	(0.226)	(0.199)	(0.231)	(0.204)
Best FB Season in 5 Years	0.319***	0.118	0.384***	0.162*
	(0.106)	(0.094)	(0.111)	(0.098)
Heisman	0.113	0.122	0.092	0.138
	(0.233)	(0.206)	(0.238)	(0.210)
FB 11-20_Lag			-0.083	0.092
			(0.082)	(0.073)
FB 6-10_Lag			0.181	0.142
			(0.112)	(0.099)
FB 3-5_Lag			-0.041	-0.003
			(0.140)	(0.124)
FB Runner-up_Lag			0.039	0.230
			(0.235)	(0.207)
FB Champ_Lag			-0.160	0.500**
			(0.238)	(0.210)
Best FB Season in 5 Years_Lag			0.236**	-0.028
			(0.111)	(0.098)
Heisman_Lag			0.052	0.069
			(0.243)	(0.214)
Athletics Scandal	-0.128	-0.067	-0.110	-0.041
	(0.154)	(0.136)	(0.155)	(0.137)
Athletics Scandal_Lag			-0.092	-0.084
			(0.157)	(0.138)
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*
School fixed effects	*Yes*	*Yes*	*Yes*	*Yes*
Observations	1819	1819	1819	1819
R^2	0.953	0.952	0.954	0.953
Adjusted-R^2	0.949	0.948	0.949	0.948

Note: Standard error in parentheses. * = significant at the 10% level; ** = significant at the 5% level; *** = significant at the 1% level

Only 1 indicator for basketball success, the lagged variable for losing in the final four, is significantly different from zero at the 10% level; all others are not. For football, we see a negative relationship between finishing in the top 20 and top 5 ranges and the 25th percentiles of scores, as well as a negative impact on the 75th percentile for finishing ranked within the top 5. Scores are positively affected by a team performing the best is has in the past five or more years, and by winning the national championship after one year of lag.

There is no impact on the quality of applications as a result of winning the Heisman nor from athletics scandals.

The appendix contains the regressions from Tables 1 and 2 without the inclusion of school fixed effects to highlight the omitted-variable bias that would exist without their presence.

VI.   Discussion

In this section I will interpret the results presented above in order to provide general themes from which we can better understand the relationship between athletics and applications.

Quantity of Applications

Table 1 summarizes the findings of the impacts of athletics on the quantity of applications received. We see a generally positive relationship between football success and applications to a given school both with and without one year of lag and school fixed effects. Winning the national championship, as well as final rankings within the top 11-20 and 6-10, carry significance in both of the application periods following the success.

It is interesting to note the distribution of the magnitudes on the coefficients of football success indicators against the level of success itself. Finishing in the 6-10 ranking group results in a larger increase to applications than does finishing in the 11-20 range; however, finishing in

within the ranks of 3-5, or even being the runner-up in a given year, do not carry significance when lagged effects are included. This is suggestive of a relationship that is not strictly increasing between the level of success of a football team and the increase in applications received in the future. Winning the national championship in football brings the largest impact on applications, increasing applications by 10.7% in the year following the victory, and an additional 9.6% in the subsequent application cycle.

Comparing these football coefficients by their impacts on male vs. female applications, we see an interesting narrative emerge as to how the effects football success vary across genders. Of the three indicators that carry significance, males have coefficients that are greater on the two lower markers of success, finishing within the top 20 or top 10, but females respond more dramatically to a national championship than do males. Although these differences are not statistically significant from one another in most instances, the relative magnitudes of the point estimates nonetheless are suggestive of the sizes of their reactions.

This disparity suggests that males' value lower levels of success more than females, whereas females value the highest level of success (a national championship) more than males. This is consistent with viewership data, as Neilsen shows that women represent only 19% of regular-season viewers of NCAA football, but 34% of bowl game viewers. This suggests that females tend to view the championship-level games more so than less important games and provides a partial explanation to these results. This is of course only one way to dissect this disparity, and only applies to the average male and female viewer.

Basketball success has a more nuanced impact on the quantity of applications received by a school. Table 1 shows that losing in the round of 64 or 32 has a negative effect on applications in the following season, but that no other coefficient of individual tournament success is significant. However, basketball does have a positive impact on the number of applications

received when a team has their best season in five or more years. Under this circumstance, female applications increase by 3%, significant at the 10% level, and males by 2.7%, significant at the 11% level.

This is an interesting result. When a team outperforms its recent historical performance, it is likely to receive more media attention that other teams that also make it to a given round in the tournament. A jump in team performance may cause people to believe that their program is on the rise, and therefore wish to join the school to be a part of the future success. Additionally, given that this variable is not significant for football teams, it perhaps indicates that individuals are more receptive to increases in program quality for basketball teams than they are for football.

The Heisman-winning school variable does not affect quantity of applications, which was surprising as having an athletic superstar brings in more media attention and viewership to the school, which I hypothesized would drive applications in a way similar to pure athletic success. One possible explanation may be that most Heisman winners go to the NFL in the year immediately following their victory, meaning that future applicants would not get to experience that player, or the success they bring, during their time at the school.

Lastly, it is also shown in Table 1 that the quantity of applications are hurt significantly by athletics scandals, decreasing male applications by 7.9% the year immediately after their emergence, and 8.5% the following year. Female applications are reduced by 5.3% and 6.3% in these periods. This result suggests that sports teams do not only provide benefits to a school, but risks as well, since athletics scandals may suppress future application numbers. Given this relationship, and that no academic paper has proven this before, Appendix A presents a detailed analysis of the different types of athletic scandals, how they come about, and how they each uniquely impact their institutions.

Quality of Applications

Now with the understanding of when and in what direction athletic success and scandals drive the number of applications, I turn next to my results on the how these factors affect the quality of these applications as measured by composite ACT score (or the SAT score equivalent converted in to an ACT score). Table 2 presents my findings on this relationship.

With the exception of the lagged effect of losing in the final four, which increases the 75th percentile by slightly over a quarter of a point at a 10% significance level, basketball tournament success does not impact the 25th or 75th percentiles of future applicant's composite ACT scores.

The indicators for football success have an interesting effect of the distribution of testing scores. Finishing within the poll rankings of 11-20 brings the 25th percentile of scores down by 0.29 points, and the top 3-5 teams see their 25th and 75th percentiles decrease by 0.35 and 0.24 points respectively. Winning the NCAA football championship has the worst effect on scores, at -0.38 to the 25th percentile, although one year later the 75th percentile is shown to increase by half a point, the largest magnitude change exhibited. Scores are only shown to unilaterally benefit from a team having their best season in five or more years, where both the floor and the ceiling of scores benefit in the short run.

These results are very interesting, as considering them within the context of those from Table 1 suggests that although football success brings in more applications, these applications tend to be of lower quality than the school would have experienced otherwise. These results are consistent with previous research (Goidel 2006, Pope 2009) suggesting that less-competitive applicants are more likely to be enticed by football success, perhaps because they make a connection between athletic success and "perceived academic quality" (Goidel, 2006).

Athletics scandals do not affect the quality of applications to a school, nor does having a Heisman winner in football.

Comparisons with Previous Findings

It is difficult to compare my individual results with those that have come before due to the disparity in measurements for success, however at a high level we are able to compare the significance of each sport on the quality and quantity of applications in order to reveal the novel contributions that this paper has on the field.

Pope et al. (2009) provide the best opportunity for a direct comparison given some overlap in our success indicators. They saw an increase of 7.6% to the log of applications following a national championship in football using data from 1983 to 2002. My results indicate that the national championship brings in a 10.7% increase to applications, suggesting that in recent years the benefit to a school, measured by the number of applications they receive, of winning at the highest level has increased.

The Pope brothers also concluded that finishing within the top 20 football teams yields an increase to applications between 2% and 8%. My findings, however, suggest that this range is 3% to 10% for total and male applications, and 3% to 11.5% for female applications. This is indicative of a general increase in the relationship between football success and the quantity of applications received.

This paper also considered the impacts of basketball on the quantity of applications, concluding that the top 16 basketball schools each year also experience increases to the quantity of their applications of 2% to 8%, depending on the year and whether the school was public or private. I used different metrics, but was nonetheless unable to find such a relationship, other than that losing within the first two rounds decreases applications by 2.6% for males and 3.1% for females. No other work has considered the impacts on each gender's applications that result from athletic success.

Other notable papers, such as Mixon and Hsing (1994) and Ressler (1995), do not allow for comparisons as they focus on the ratio of in vs. out of state applications rather than their absolute value.

Turning next to my contributions on the impacts of athletic success of the quality of applications, I turn again to Pope et al. (2009) for comparisons. They were able to consider a more granular breakdown of standardized testing scores, and were therefore able to conclude that, across both men's basketball and football, the "the extra applications received are composed of both low and high scoring students," indicating that the distribution of these scores as I measure them may not be affected.

However, I see that in the application period directly following the success, the 25th percentile of scores is negatively impacted following a school finishing in the top 11-20, 3-5, and as the champion. This is contrary to the results presented by Pope et al., and indicative of the fact that football success brings in more lower quality applications than it does higher.

Other work considers the impacts of year-over-year success, for example Tucker et al. (1993) found that if a school met a certain 10-year-average ranking threshold, they saw a 3% increase in SAT scores during that time. My work uses different metrics, but sees that a school having their best season in five or more years yields a 0.38 point increase to the 25th percentile of ACT scores, and a 0.16 point increase to the 75th percentile, indicating that the overall quality applicant pool increased as a result of this short-term historical success.

Conclusions

So why doesn't basketball matter as much as football? At first glance, it seems as though Tables 1 and 2 allow us to conclude that football has a much larger effect on both the quantity and quality of applications to a school than does basketball, but is this really the case?

It is important to note that, with the exception of the *Champion* and *Runner-up* indicators, we cannot accurately compare the coefficients on basketball success with those of football because I use different measures for success. Whereas the basketball indicators take advantage of the unique postseason design of the March Madness tournament, there exists no comparable entity in football, and therefore the final AP Poll was used to measure the success of a football team in a given year. These different measurements of success make comparisons between all but the outcome of the championship games in both sports inaccurate. Thus, we cannot confidently say that "football matters more than basketball across the board" in the relationship between athletics and admissions.

However, we can conclude the following: with the exceptions of losing in the first two rounds, which negatively affects quantity, and of the lagged effect of losing in the final four, which positively affects quality, the outcomes of each season's men's March Madness tournament don't have a meaningful impact on the quantity or quality of applications. Given how large an audience the tournament garners, this result is both surprising and confusing.

One explanation for this could be that using depth in the March Madness tournament is not the best measure of basketball success; perhaps another measure, such as AP Poll rank, would have yielded more significant results. I used tournament results in order to take advantage of the unique design to the college basketball postseason, as well as because teams that go deeper in the tournament receive more media attention than ones that do not. At the same time, however, the best teams don't always make it the furthest, such as when top-seeded UVA lost in the first round in 2018, and applications may therefore be more affected by true team quality rather than by media attention and viewership. Future studies could use the final AP Poll rankings for both basketball and football to bring to light an accurate comparison between various levels of success across the two sports.

A second explanation could simply be that potential applicants do value basketball less than they do football. The average football team brings in 3.9 times the revenue than the average men's basketball team does (Nudelman), and a 2018 Gallup poll revealed that 37% of Americans listed football and their favorite spectator sport, with basketball being in second place at just 11%. This disparity in revenue and viewership, paired with collegiate football's significant effects on the quantity and quality of admissions applications, is substantial evidence that football is still king in America.

VII. Athletics Scandal Analysis

Given the significant impacts that athletic scandals have on the quantity of applications received by a school, it is important to dissect these events further in order to shed light on how they come about and the impacts that they have on their institutions. Appendix A contains a more detailed analysis of this relationship.

There are three main types of athletics scandals: monetary benefits, academic benefits, and moral misconduct. Monetary-benefit scandals are the most frequent in the dataset, making up 16 of the 33 occurrences in the past 17 years. The NCAA strictly prohibits providing athletes or recruits with any financial incentive to attend one school over another, but it is well-known that these rules are often bent and broken. Monetary benefits can come in many forms, from cash, to extra textbook money, to providing the parents of a player with a job, but they all have the same goal: to help bring players to a given school over the others that they are considering.

When it comes to how monetary benefit scandals impact non-athlete students, it comes down to the precedent that the team and the school are setting for how they wish to succeed. By giving themselves an unfair advantage in the recruiting process, they are exhibiting a will to cheat their way to athletic success, a value that is likely at odds with some potential applicants.

Additionally, the punishments for these offences are often light, typically coming in the form of probation or a fine, and therefore teams are not wholly discouraged from committing them. Given the increasing accessibility to information, it is likely that we will see more of these scandals come to light in the future in the absence of stricter punishments being handed down from the NCAA.

The second form of athletic scandals is that of giving academic benefits to players, such as excessive tutoring or looser academic requirements. These scandals make up 9 of the 33 in the dataset, but they are not necessarily less frequent than those of monetary benefits. It is difficult to prove that a tutor is giving too much help to a student, or that a teacher or class has lower expectations of an athlete than they do for others, and therefore investigations in to these offences are often not conclusive, as evidence by the ongoing investigation in to the University of North Carolina that began in 2011.

The incentive to a recruit to attend a school that they know will have looser academic standards for them lies in their opportunity to focus more on their development as a player. Many athletes come to a school with the hope of playing their sport professionally afterwards, and therefore wish to focus as much energy to achieving this as they can. At the same time, however, the main purpose of a college or university is to provide their students with a high-level education, and thus when a school loosens their standards to excel in athletics they are failing at this very purpose. It is not difficult to see, therefore, why an applicant would be deterred from applying to a school that exhibits this behavior, as it may be indicative of the fact that they will receive a lower quality education than they would elsewhere. This perspective is likely a significant contributor to the overall negative impact that athletics scandals have on the quantity of applications received.

The final form of athletics scandals are those of moral misconduct. It is difficult to define these scandals as they are usually unique and isolated events. Instances such as the Louisville sex scandal in 2015 and the Penn State child molestation scandal in 2012 are two of the more notable occurrences under this umbrella.

Despite these events typically being committed by just one or a small group of people, they are nonetheless indicative of an inability to judge character on the behalf of the institution they are a part of. It suggests to applicants that the school has a lack of regard for the integrity of the individuals they employ or the players they field, and ultimately reflects very poorly on the school in question. These scandals often receive the harshest punishments from the NCAA, coming in the form of forfeited scholarships or future postseason ineligibility.

Athletics scandals are an unfortunate yet important variable to the relationship between athletics and admissions applications, and until the NCAA begins to enforce stricter punishments on schools indicted in such violations, we can remain sure that they will continue to occur for years to come.

VIII. Conclusion and Future Research

Institutions of higher education are made up of their student bodies. There exists a constant competition between such institutions to continue to attract the most talented high school students in the country in order to ensure that their schools is better tomorrow than it is today. In years past, students may have been attracted to a school for its exceptional departments or funding for research, however the growing ubiquity of entertainment sports in American society has meant that collegiate athletics now more than ever are driving students to apply to colleges and universities. Nationally televised athletic success serves as a marketing vehicle for

the school, allowing them to both get their name out to prospective students, as well as putting on display the opportunity for these individuals to be a part of future athletic success.

This paper combines a quantitative analysis of the relationship between athletics and the quantity and quality of applications to US colleges and universities over the past 17 years, and serves as a complement and an addition to previous work in this fields that were both lacking in depth and dated. My results update many and reaffirm some of the previously held conclusions around the relationship between football success and applications. I show that increasing levels of football success have increasingly positive effects on the number of applications that a school receives in the subsequent admission periods, but also that these applicants tend to have lower standardized test scores unless the team is the national champion.

Additionally, through the new lens of basketball success alongside that of football I conclude that previous literature in this field has suffered from excluding indicator basketball of basketball success as I was able to find instances of significant relationships between March Madness performance and the number of applications sent to a school, as well as remove any bias that may have existed due to a school experiencing simultaneous basketball and football success.

Considering the impacts of athletics scandals proved to be a novel yet important addition to my analysis as I found that these events reduce the quantity of applications in both years following them being brought to light, but was also able to provide anecdotal evidence for their upside potential via a qualitative analysis (Appendix A). This important perspective has become ever more worthy of consideration in recent years as news media around athletic teams is being consumed more often than ever by the general public, and investigations continue to open about the ethics and motivations behind collegiate athletics.

Future work might consider a financial analysis on improving one's athletic programs through additional funding so as to provide a model for the price of driving applications through athletics compared to more conventional factors such as updated amenities and departmental advances. Such work would complement this paper as it would create a more holistic understanding of the methods employed by schools to drive applications and their rationale for doing so.

Additionally, as athletics scandals continue to occur, future work could also empirically analyze the effects that each of the three types of scandals have on applications. This work was unable to do so given how few observations there were for each, however it is likely that in the future there will be a sufficient sample size such that a statistical analysis will be possible

It is the hope that these results provide a clear and thorough understanding as to how athletic programs impact applications to institutions of higher education, and place further importance on the role that collegiate athletics have assumed within American society.

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Figures

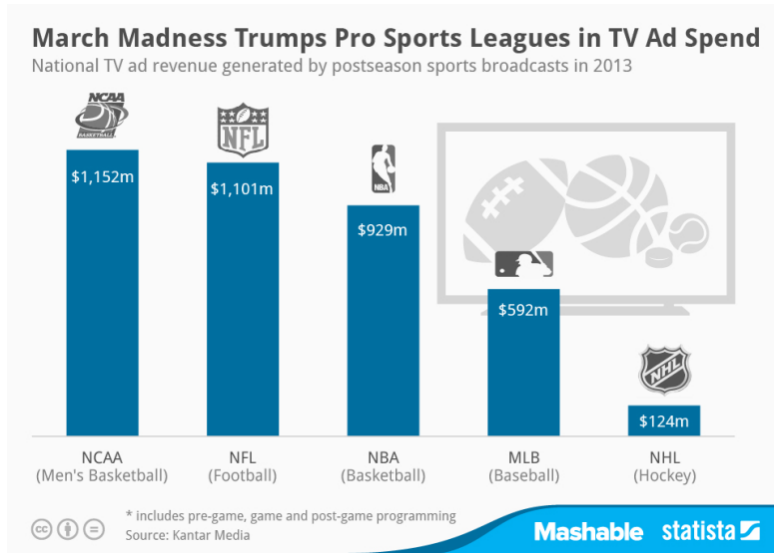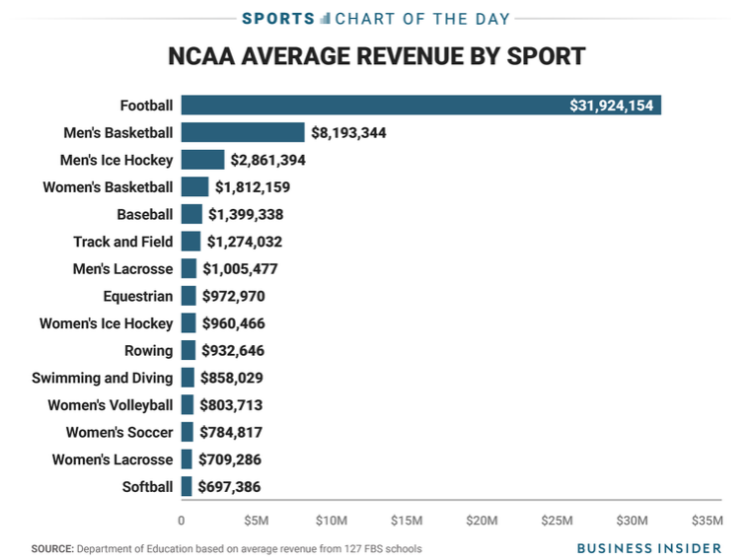Figure 1: March Madness TV ad revenue vs. other postseasons

Figure 2: collegiate sport revenue by team

Appendix A: Extended Scandal Analysis

In this appendix I take a closer look at the different types of athletics scandals and use anecdotal evidence from a handful of them in order to tell their stories in ways that a regression model is unable to do. I will outline the three main types of scandals, their implications for the team and the school, and the punishments they receive from the NCAA in order to provide a qualitative understanding of how these infractions can affect a team, its school, and its non-athlete students.

Monetary Benefits

The most common scandals are those involving provided prohibited monetary benefits to players or their families. Under NCAA regulations, student-athletes are not allowed to make money from their "likeness" (NCAA Bylaws, Section 12.5) until they turn professional. However, there is a long history of under-the-table payments to players or their families from coaches, team affiliates and boosters in an effort to sway a recruit's decision towards one school over another.

These monetary benefits can come in many forms and sizes, from direct deposits to extra textbook money to providing jobs to the parents of players, but regardless of how these cash flows materialize, they are a deliberate infraction of NCAA rules intended to gain an advantage on the field with improved recruiting classes. These benefits take advantage of the fact that 86% of all student-athletes live in poverty (NCPA), making the prospect of financial gain prior to a professional contract is very enticing. When top recruits are considering several programs of similar quality, it is not unreasonable to think that a few thousand dollars would be enough to bring them to one school over another.

Of the 33 scandals that have occurred in the 17 years of my dataset, 16 of them involved monetary benefits given to the player, and these are just those proven through NCAA investigation. Frequent rumors and public suspicions align with the widely-held perception that these benefits are likely much more common than are publicized due to mutual interests in hiding them.

Given the positive impacts that monetary benefits can have on a team through better recruiting classes, it is interesting to consider instances in which they may have benefitted a school's athletics or applications. A prime example of this came from 2005 to 2009 at the University of Alabama. In 2009, a news story broke that for the previous five years the team had been giving its football players excessive amount of money for textbooks, and that the players were able to use their extra funds to purchase and sell books to their peers for a profit. At this time, Alabama in the middle of a historic stretch of football success, going from finishing unranked from in 2001 and 2002 to finishing within the top 10 and a national championship in the five-year stretch between 2005 and 2009. After their exposure, the NCAA vacated some of their wins during this time frame but did not rule them ineligible from future play not make then forfeit any scholarships. Alabama would go on to win two more national titles in three years, and their applications rose from 9,100 in 2004 when they began providing benefits to their players, to 20,000 in 2009 when they were ultimately caught, to 31,000 in 2013 after their third national championship. During this same time frame their 25th percentile of ACT scores remained constant, but their 75th percentile increased from 26 to 32.

It would be neither fair nor accurate to attribute these increases in the quantity and quality of Alabama's applications solely to athletic success, much less to say that the reason for this success is that they were providing players with prohibited monetary incentives. However, it is also difficult to rule out these factors in this equation. Although this is not the story for all of the

other schools that were found guilty of monetary-benefit violations, we do see similar narratives at the University of Michigan in 2003 and the University of Southern California in 2010, suggesting that is not as much of an anomaly as it might initially seem.

How might providing monetary benefits to players impact non-athlete students or potential applicants? The model shows that athletics scandals as a whole result in fewer applicants in the years following their emergence, so it is important to consider how each type might have this effect.

It is difficult to see how monetary benefits to players would have a tangible impact on other students, as the money going their way is either from the team budget or boosters rather than the school itself, under which case one could argue that these payments detract from school funding. However, it is nonetheless indicative of the school, or those affiliated with it, lacking the moral integrity to compete fairly, instead opting to cheat their way to greater success. Additionally, in select circumstances the NCAA hands down punishments that require teams to forfeit scholarships or make them ineligible for postseason play. These punishments have a real effect on the future quality of a team, and an applicant might therefore be discouraged from applying to a school whose football or basketball team was handicapped during his or her time there. These types of punishments are rare, however, and occur most frequently as a result of moral misconduct scandals, as I will explain later.

Academic Benefits

The second most common type of scandal involve *academic* benefits given to student-athletes. This includes but is not limited to tutors that will complete work for the student, easier classes intended for athletes, or looser grading requirements. These benefits allow the athletes to focus more on improving their performance on the field and their chances at turning pro, and to

be less concerned with academic responsibilities. For some student-athletes, these benefits may be necessary to retain eligibility. They also provide a longer-term incentive for a student to attend one school over another, as it presents them with a greater opportunity to reach their highest potential and get drafted by a professional team earlier or in a lower round.

Academic benefits represent 9 of the 33 scandals in the dataset, although this may not be evidence for them occurring with less frequency than monetary benefits. Whereas cash flows are easier to track and uncover, proving that a school deliberately lowered standards or provided excessive help to a student-athlete is much more difficult. Identifying how much tutor help is too much, or determining with certainty that a teacher had lower standards for one student over another, is extremely difficult. For these reasons, academic-benefit scandals remain nuanced and murky, and often an investigation will open but will not result in any sanctions due to lack of evidence, as was the case with the University of North Carolina in both 2011 and 2014. Other instances of notable academic benefit scandals came at Binghamton in 2010 and Syracuse in 2015.

In terms of non-athletic impacts, it is much easier to see why a potential applicant would be discouraged from applying to a school that has been caught in an academic scandal. The purpose of a college or university is to provide a higher education to all those who attend, and by lowering certain standards for some students, it is both failing at its main purpose for some and falling short for others. The classes and teachers than have lower standards for athletes are likely to also enroll non-athlete students as well, whose academic experiences are therefore suffering at the expense of the athletic benefit of others. Providing academic benefits to student-athletes is therefore unfair to all of the students at a school, and this paper shows that schools do end up paying a price for it – both from the NCAA and from applicants.

Moral Misconduct

The last and least frequent type of scandal are those that involve moral misconduct on the behalf of a team's coaches or players. These scandals involve individuals purposefully acting without moral integrity – through domestic abuse, sexism, racism, etc. These scandals, although they are rare with only 8 occurrences in the past 17 years, tend to receive the most media attention, as well as the harshest punishments, both self-instituted and from the NCAA.

Examples of moral misconduct scandals include, most notably, the Louisville sex scandal in 2015, the Penn State child sex abuse scandal in 2012, Joe Mixon's domestic abuse in 2014, and BYU's premarital sex scandal in 2010. These scandals make the biggest headlines as they are the most shocking to hear about given their lack of athletic context and, in some cases, criminal nature.

Each of these events are unique, and this type of scandal often is a result of the actions of one individual or a small group of people, but is nonetheless reflective of the school's failure in ability to judge character of athletes or coaches, and therefore reflects poorly in its own way on the institution. In 2016, the year after Louisville was caught in a scandal involving them hiring sex workers for players and recruits, Louisville's applications were down 11% for females and 6% for males. This dramatic change, especially for female applicants, is indicative of the fact that the basketball team, acting on the behalf of the school, acted with a clear disrespect for women, and applicants showed their disapproval in the years to follow.

Narratives such as these are why individuals may choose not to apply to a school in the years following an athletics scandal involving moral misconduct and help to explain some of the risks that a team takes on when they field an athletics team.

Synthesizing

Athletics scandals are a unique and growing component to collegiate athletics. Each of the three types of scandals have their own impact of their schools and their non-athlete students. It is last important to note the kinds of punishments handed down by the NCAA or the institutions themselves when these events are brought to light.

Punishments range in severity from probation, to fines, to forfeiting scholarships, to postseason ineligibility. Although it has been shown here that the actions behind certain scandals can have real benefits to athletic teams, it is not always the case that the punishment erases these benefits, suggesting that there are instances in which the risk-reward may be in favor of the schools under the right circumstances.

Consider, for example, the instance of the University of Alabama from 2005 to 2009 outlines above. As a result of this scandal, the team was placed on probation as was forced to vacate wins from the seasons in which they violated NCAA rules. However, these punishments, although seemingly severe, do not have a real impact on the future of the team, and in no way handicaps them for cheating their way to success. Although the team faced embarrassment and was perhaps judged as a result, the school still continued to grow its number of applicants as well as in their football dominance which has been unparalleled ever since. This is a common theme amongst these scandals, and begs the question of whether the punishments for infractions such as these are hard enough?

Out of the 33 scandals considered in this paper, only 8 of them resulted in forfeited scholarships or postseason ineligibility, the two metrics that have a real impact on the quality of the team. Of those 8 instances, 4 of them came on 8 scandals involving moral misconduct, meaning that of the 25 monetary or academic benefit scandals, only 4 of them ended up having implications for the future success of the team in question.

As collegiate athletics become increasingly more competitive, it is important that its governing body takes action to remove incentives for fraudulent success. It is unlikely that activities such as those presented in this section will cease to occur without stricter punishments and more rigorous checks and balances for the teams. I hope that this work helps to provide understanding as to why these infractions take place, and the impact that they have on their respectively school both academically and athletically.

Appendix B: Additional Tables

Effect of Athletics on Admissions Applications

			Log Applications			
	Total	Male	Female	Total	Male	Female
Round of 64 / 32	0.158***	0.161***	0.171***	0.074*	0.074*	0.085**
	(0.037)	(0.039)	(0.038)	(0.042)	(0.044)	(0.043)
Sweet 16 / Elite 8	0.320***	0.324***	0.337***	0.192***	0.193***	0.204***
	(0.057)	(0.060)	(0.058)	(0.064)	(0.067)	(0.065)
Final 4	0.409***	0.394***	0.446***	0.166	0.145	0.195
	(0.124)	(0.130)	(0.126)	(0.134)	(0.141)	(0.136)
BB Runner-up	0.437**	0.464**	0.418**	0.259	0.283	0.228
	(0.180)	(0.189)	(0.183)	(0.186)	(0.194)	(0.189)
BB Champ	0.551***	0.523***	0.600***	0.352**	0.321*	0.391**
	(0.169)	(0.177)	(0.172)	(0.178)	(0.186)	(0.181)
Best BB Season in 5 Years	-0.129**	-0.133**	-0.130**	-0.043	-0.044	-0.040
	(0.057)	(0.059)	(0.057)	(0.060)	(0.063)	(0.061)
Round of 64 / 32_Lag1				0.107***	0.107**	0.118***
				(0.041)	(0.043)	(0.041)
Sweet 16 / Elite 8_Lag1				0.241***	0.249***	0.248***
				(0.066)	(0.069)	(0.067)
Final 4_Lag1				0.258**	0.241*	0.286**
				(0.131)	(0.137)	(0.133)
BB Runner-up_Lag1				0.364**	0.386**	0.342*
				(0.183)	(0.191)	(0.186)
BB Champ_Lag1				0.464***	0.442**	0.498***
				(0.171)	(0.179)	(0.173)
Best BB Season in 5 Years_Lag 1				-0.127**	-0.124**	-0.131**
				(0.058)	(0.060)	(0.059)
FB 20-11	0.179***	0.203***	0.169***	0.099*	0.119*	0.090
	(0.055)	(0.057)	(0.056)	(0.058)	(0.061)	(0.059)
FB 10-6	0.328***	0.355***	0.317***	0.221***	0.239***	0.213**
	(0.077)	(0.080)	(0.078)	(0.083)	(0.087)	(0.084)
FB 5-3	0.378***	0.386***	0.388***	0.235**	0.239**	0.243**
	(0.092)	(0.096)	(0.093)	(0.099)	(0.104)	(0.100)
FB Runner-up	0.267	0.291*	0.265	0.065	0.096	0.049
	(0.165)	(0.173)	(0.168)	(0.177)	(0.185)	(0.180)
FB Champ	0.519***	0.508***	0.546***	0.364**	0.348*	0.390**
	(0.165)	(0.172)	(0.167)	(0.172)	(0.180)	(0.174)
Best FB Season in 5 Years	-0.099	-0.092	-0.113	-0.002	0.007	-0.015
	(0.076)	(0.080)	(0.077)	(0.081)	(0.084)	(0.082)
Heisman	0.097	0.035	0.154	0.019	-0.039	0.072
	(0.179)	(0.187)	(0.181)	(0.181)	(0.189)	(0.183)
FB 20-11_Lag1				0.096*	0.120**	0.079
				(0.056)	(0.059)	(0.057)
FB 10-6_Lag1				0.163**	0.182**	0.151*
				(0.082)	(0.086)	(0.083)
FB 5-3_Lag1				0.199**	0.210**	0.196*
				(0.100)	(0.105)	(0.102)
FB Runner-up_Lag1				0.181	0.223	0.153
				(0.168)	(0.175)	(0.170)
FB Champ_Lag1				0.395**	0.378**	0.416**
				(0.175)	(0.183)	(0.178)
Best FB Season in 5 Years_Lag1				-0.013	-0.015	-0.016
				(0.080)	(0.084)	(0.081)
Heisman_Lag 1				0.037	-0.034	0.102
				(0.181)	(0.190)	(0.184)
Athletics Scandal	0.050	0.021	0.075	0.035	0.003	0.063
	(0.117)	(0.123)	(0.119)	(0.118)	(0.123)	(0.120)
Athletics Scandal_Lag 1				0.044	0.021	0.065
				(0.119)	(0.124)	(0.120)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
School fixed effects	No	No	No	No	No	No
Observations	2016	2016	2016	2016	2016	2016
R²	0.166	0.151	0.171	0.180	0.164	0.186
Adjusted-R²	0.154	0.138	0.159	0.162	0.146	0.167

Note: Standard error in parentheses. * = significant at the 10% level; ** = significant at the 5% level; *** = significant at the 1% level

Effect of Athletics on ACT Composite Scores

	ACT Composite Score			
	25th Percentile	75th Percentile	25th Percentile	75th Percentile
Round of 64 / 32	0.894***	0.995***	0.528**	0.567***
	(0.207)	(0.178)	(0.235)	(0.201)
Sweet 16 / Elite 8	1.498***	1.507***	0.972***	0.915***
	(0.315)	(0.270)	(0.357)	(0.305)
Final 4	1.406**	1.715***	0.363	0.591
	(0.676)	(0.581)	(0.734)	(0.629)
BB Runner-up	1.488	1.585*	0.729	0.720
	(0.954)	(0.820)	(0.987)	(0.846)
BB Champ	3.749***	3.220***	3.002***	2.376***
	(0.989)	(0.850)	(1.035)	(0.887)
Best BB Season in 5 Years	-0.445	-0.611**	-0.089	-0.215
	(0.312)	(0.268)	(0.333)	(0.285)
Round of 64 / 32_Lag1			0.387*	0.555***
			(0.228)	(0.195)
Sweet 16 / Elite 8_Lag1			1.053***	1.180***
			(0.368)	(0.315)
Final 4_Lag1			0.586	0.832
			(0.719)	(0.616)
BB Runner-up_Lag1			0.629	0.846
			(1.006)	(0.862)
BB Champ_Lag1			2.360**	2.098**
			(0.955)	(0.818)
Best BB Season in 5 Years_Lag 1			-0.251	-0.410
			(0.319)	(0.274)
FB 20-11	1.144***	1.196***	0.760**	0.811***
	(0.312)	(0.268)	(0.332)	(0.285)
FB 10-6	1.550***	1.379***	1.009***	0.823**
	(0.424)	(0.364)	(0.462)	(0.395)
FB 5-3	1.883***	1.755***	1.266**	1.096**
	(0.506)	(0.435)	(0.551)	(0.472)
FB Runner-up	2.296***	2.391***	1.575*	1.554*
	(0.883)	(0.759)	(0.950)	(0.813)
FB Champ	1.816**	2.175***	0.984	1.376*
	(0.873)	(0.750)	(0.915)	(0.784)
Best FB Season in 5 Years	-0.287	-0.355	0.128	0.062
	(0.418)	(0.359)	(0.443)	(0.379)
Heisman	0.073	0.078	-0.242	-0.207
	(0.960)	(0.825)	(0.971)	(0.831)
FB 20-11_Lag1			0.741**	0.841***
			(0.321)	(0.275)
FB 10-6_Lag1			0.754*	0.702*
			(0.450)	(0.385)
FB 5-3_Lag1			1.123**	0.918*
			(0.562)	(0.482)
FB Runner-up_Lag1			1.724*	1.660**
			(0.936)	(0.802)
FB Champ_Lag1			0.941	1.646**
			(0.953)	(0.816)
Best FB Season in 5 Years_Lag1			-0.073	-0.116
			(0.443)	(0.380)
Heisman_Lag 1			-0.418	-0.448
			(0.990)	(0.848)
Athletics Scandal	0.672	0.560	0.461	0.382
	(0.630)	(0.542)	(0.636)	(0.545)
Athletics Scandal_Lag 1			0.757	0.595
			(0.639)	(0.548)
Year fixed effects	Yes	Yes	Yes	Yes
School fixed effects	No	No	No	No
Observations	1819	1819	1819	1819
R^2	0.091	0.113	0.105	0.133
Adjusted-R^2	0.075	0.098	0.083	0.112

Note: Standard error in parentheses. * = significant at the 10% level; ** = significant at the 5% level; *** = significant at the 1% level