

# College Football and Student Quality

## *An Advertising Effect or Culture and Tradition?*

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ABSTRACT. Intercollegiate sports are said to generate positive advertising that produces many benefits to the host school. Donations, applications, and the academic quality of the student body are some of the mission outcomes thought to rise with the fortunes of the football team. The present study tests these claims for three measures of the academic quality of the entering classes on a 12-year panel of the 233 colleges and universities competing at the highest levels of football. Results show clear positive effects attributable to the football program, though those effects are more the result of the football culture and tradition at the school than the on-field performance of the team. Any sports advertising effects of the football program are minimal when compared to the effects of nonathletic institutional characteristics on the quality of students enrolling at the school.

### I

#### **Introduction**

COLLEGE SPORTS HAVE ENTERED yet another round of the athletics arms race, and schools are again spending millions to upgrade their facilities. In just the past decade, the University of Texas has spent \$150 million to remodel its football stadium, the University of Michigan spent \$266 for upgrades including luxury suites and club seating, while Oklahoma State has kept pace with \$165 million to spend on its programs (McCafferty 2006). Colleges are also allocating millions for coaching—the head football coach at a major state university

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continues to be the highest paid state employee—and the University of Alabama has upped the ante considerably with its recent hire at an annual salary of \$4 million.

Proponents of such athletic spending justify the practice with reference to the general mission of the host college or university. Programs need to build bigger and better facilities in order to attract better athletes and coaches and to maintain fan interest and comfort at the games. This allows a program to be “successful,” and success translates to more pride in the institution, which ultimately leads to benefits for the entire school. The list of presumed consequences of a winning program is long. Alumni give more to the academic programs of the college, corporate donations are attracted by winning football teams, and state legislatures open the checkbooks at appropriation time because of the successful football team. More students apply to the school, as do more out-of-state students, thus raising tuition revenues. The academic quality of the student body rises as better prepared students are drawn by the successful football program, and student retention and graduation increase because the undergraduate experience is enhanced by the presence of big-time intercollegiate athletics. Overall, the college rises in the annual rankings as it can be more selective when crafting a first-year class, percentages of alumni supporting the school similarly rise, and student satisfaction with the undergraduate experience is increased.

What ties together these disparate positive outcomes attributed to big-time athletics is the branding the institution receives via its sports programs. Schools come to be associated with their football and basketball teams and that increases the public’s awareness of the institution and, hopefully, the school’s academic programs and offerings. The school receives attention in the media, especially during the postseason play of football bowls and the NCAA basketball tournament, which further advances public awareness. Hence the claim of an “advertising effect” arising from big-time intercollegiate sports success.

Whether a successful program can deliver as promised is an empirical question and one that the academic literature is just beginning to answer. As might be expected, answers to date offer mixed support, in part because of a relative paucity of data, widely varying definitions

of athletic “success,” and what I will argue is some conceptual confusion surrounding the definition of the advertising effect. I address each of these via an analysis of one aspect of the advertising effect—how big-time football programs are related to the academic quality of the first-year class. After reviewing previous studies of athletic branding and advertising, I make a crucial distinction between the sports culture and tradition at the college or university and the more variable performance on the field.

A pooled panel analysis of football performance at the highest levels of intercollegiate competition shows that both aspects of the football program do indeed influence the credentials of students entering the institution, but the payoff in student quality from any sports advertising is small and can be fleeting.

## II

### **Literature Review**

STUDIES OF THE IMPACT of football on the university writ large were first published over 20 years ago. Early studies (Sigelman and Carter 1979; Brooker and Klastorin 1981) found few relationships between winning percentage and alumni donations or other measures of football success and donations (Sigelman and Bookheimer 1983; Sack and Watkins 1985). Gaski and Etzel (1984) found no relationship between winning percentage and indicators of alumni and nonalumni financial support at 99 Division I programs.<sup>1</sup> Turner et al.’s (2001) study of individual donors yielded no relationship between won-loss record in football and contributions to the general fund for graduates of the selective colleges and universities that comprised their sample. Later studies tend to be more positive about the relationship between football success and donations to the school. Bowl appearances may raise the value of alumni gifts at doctoral institutions (Baade and Sundburg 1996). As well, winning has been related to alumni giving at private colleges (Baade and Sundburg 1996) and at schools belonging to the Bowl Champion Series (BCS; Tucker 2004). Alumni at some Division IA schools, but not other donors, may increase their donations slightly after increased winning by the football team (Rhoads and Gerking 2000).

Some college-seeking teenagers appear to be influenced by football success. At least slight increases in applications have been tied to championship football or basketball seasons (Toma and Cross 1998), higher in-BCS conference winning percentages (Murphy and Trandel 1994; McEvoy 2005), and having a player finish in the top five of the annual Heisman trophy voting (McEvoy 2006). These application increases may even result in increased enrollment, as suggested by Chressanthis and Grimes's (1993) case study. As Mangold et al. (2003) hypothesized, sports programs should help integrate students into campus life and thus successful teams should be one factor increasing student graduation rates. The evidence for this is quite mixed, as findings of no relationship between football success and graduation rates (Mangold et al. 2003), small positive relationships (Tucker 2004; Mixon and Treviño 2005), and even a negative relationship (Tucker 1992) have been reported.

Studies of how football success and advertising influence the academic quality of entering students are relatively numerous. One of the first was McCormick and Tinsley's (1987), which showed that being in a major sports conference increased the average freshman SAT score by 3 percent. Mixon et al. (2004) found a positive relationship between the median SAT score of the entering class and football winning percentage over the period between 1990 and 2000. Highly ranked football teams boosted freshman SAT scores in Tucker and Amato's (1993) analysis of a similar sample of BCS institutions. Bremmer and Kesselring (1993) explicitly investigated the advertising effect of sports on the SAT scores of incoming freshmen. No sport effects were found, and they concluded there was no evidence for an advertising effect. Big-time BCS schools comprised Tucker's (2005a) sample where he found that both participation in postseason bowls and end-of-season rankings in the Associated Press poll produce higher incoming SAT scores, but only after the creation of the Bowl Championship Series in 1996. He concludes that there is strong evidence for an advertising effect as a result. Tucker (2005b) also shows that membership in the major BCS conferences is a factor in the increased SAT scores of a freshman class.

Even a cursory glance at studies linking success in intercollegiate athletics to mission outcomes leads to several conclusions. First,

evidence supporting positive outcomes is decidedly mixed. While some studies lend credence to a sports advertising effect on portions of the school's mission, others find no relationship between sports performance and giving, applications, and so forth. Still other results point to negative impacts on the university from big-time football. Second, the vast majority of prior research has centered on a small subset of schools participating at the highest levels of football. Admittedly, these are the schools from "power" conferences, the programs for which data were most available for early studies, and more recent research has had the laudable goal of maintaining comparability with those initial studies. But this limited sample may have actually truncated both positive and negative relationships in that coefficients are estimated for only those schools where any exposure and positive advertising from sports success can be expected to be greatest. There are other colleges and universities participating in Division I football that may not share the brand identity of the schools studied most extensively by previous research.

A final conclusion that can be reached from a review of this literature is that what is meant by "football success" and "sports performance" varies greatly from study to study. Some use yearly won-loss percentage; others aggregate winning and losing over a specified time period. Postseason bowl appearances are treated similarly. Some authors employ performance indices specific to their study. Another common measure takes end-of-season rankings as the indicator of performance.

What is lacking *across* the advertising effects literature is a consistent use of the central concepts of "athletic branding" and "advertising effects." Both offer the same utility to participating colleges and universities in that sports offer a way to get a school's name "out there" and potentially generate interest in what the institution has to offer prospective students, donors, and other external parties. But having a brand and advertising it are distinct processes, and it is not clear that sports success can yield either for some schools. More importantly, as I argue in the next section, what some have treated as advertising and branding may reflect a much different underlying process.

## III

**Advertising or Culture and Tradition?**

THE SPORTS ECONOMICS LITERATURE focuses on the advertising and branding benefits that accrue from successful athletic programs. A more sociological perspective suggests that what are operating are established sports cultures that privilege some schools over others. Authors indirectly point to this possibility by highlighting the processes that occur over a longer time frame. Mixon and Treviño (2005) call their 10-year average winning percentage a measure of “football heritage” rather than success per se. Murphy and Trandel (1994) say that it is consistent, long-term success that leads to a boost in advertising.

But longer term influences can be contrasted with short-term processes. What is clearly “advertising” is the media attention devoted to college football each fall. Narratives surrounding particular teams and players vary from campaign to campaign, with the attention received by a school likely to depend on the team’s fortunes that season. Spectacular or unexpected success breeds nationwide attention and the greatest publicity for the institution. This has been linked to the advertising effect. Coughlin and Erikson (1985) suggest that it is the “special success” that might boost contributions, a claim similar to Toma and Cross’s (1998) contention that compelling stories and breakout seasons might be the cause of any increases in applications produced by sports.

Relating more stable aspects of intercollegiate athletics to the school’s mission introduces sociological explanations. For example, one thread in the justification of big-time sports is that college athletics are part of the college experience (McCormick and Tinsley 1990) that provides social integration for the school and larger community (Sack and Watkins 1985). Toma (2003) offers the strong argument that college football is a way for alumni to remain connected to the culture of their alma mater while at the same time making the collegiate culture available to those who did not attend the institution. Thus the question: How much of the advertising effect is really the result of different sports cultures and traditions across colleges and universities?

“Tradition” or “institutional age” has often been measured in years since the college or university was founded. This has been used in models of athletic program effects, but with very uneven results. Some

studies (McCormick and Tinsley 1987; Rhoads and Gerking 2000; Tucker 2004) find that the older the institution, the higher the outcome being investigated (SAT scores, donations and graduation rates, and giving, respectively). Other studies (Bremmer and Kesselring 1993) find that age effects dissipate once other statistical controls are entered, impact some mission outcomes but not others (Amato et al. 1996), or are important only within subsets of schools (Baade and Sundburg 1996). Institutional age was found to be unrelated to SAT scores (Tucker and Amato 1993) and retention and graduation rates (Mixon and Treviño 2005).

These mixed results suggest that the school's academic "tradition," as captured by the age of the college or university, may not be the driving force attracting and keeping students at the school or motivating alumni and other donors. As an alternative, I suggest that it may be the sporting tradition at the institution that carries more predictive weight. This is easily measured by the age of the program or how many years the school has been playing football. "Football age" will, of course, be highly correlated with the age of the school itself—older institutions were the ones that invented the game—so that both variables cannot be included simultaneously in any statistical model. But at the margins where newer programs were added to colleges incorporated many years earlier, the age of the institution and the age of the sports program may tap different forms of tradition.

One final aspect of a program's appeal to potential students is how the school's football fortunes capture the attention of local and regional fans. The argument is a variant of that offered by Markovitz and Hellerman (2001) to account for why soccer has never taken hold in the American sports culture. Briefly, certain sports, led by college football, settled into the American "sports space" during the crucial period between 1870 and 1930, and this cultural space became saturated. The sports space is relatively immutable as, once ensconced, sports use their hegemonic power to keep other activities from entering and sharing the public's attention. As a consequence, newer sports (e.g., soccer, golf, tennis, and later auto racing and more recently extreme sports) find it difficult to gain a cultural foothold and become economically dominant like those sports that have historically appealed to all social classes.

Much the same can be said about regional and local sports cultures centered on intercollegiate athletic teams, especially “big-time” football teams. Certain programs gained early prominence, both locally and nationally, during the development of the national sports space, thus placing them firmly in a cultural space that provides distinct advantages for developing brand awareness and advertising for the colleges and universities fielding those teams. These schools also have historically used their hegemonic power to maintain their regional and national prominence. From the 1984 Supreme Court decision allowing schools to negotiate their own television contracts through the creation of the College Football Association to the Bowl Championship Series (comprised of the “power” conferences and independent Notre Dame), a group of programs has been able to leverage their position in ways that help maintain their exposure and economic advantage.

The contention, then, is that what has been called “branding” and the advertising effect of intercollegiate sports is preceded by the creation and maintenance of football cultural “spaces” that are less mutable and transient than some forms of advertising that can arise from seasonal fluctuations in football success. Sigelman and Bookheimer (1983) attempted to tap into this stable component of football culture—via the use of the percent of workers in the state in agriculture as an indicator of a “hotbed” factor—with the expectation that schools in hotbed locales received higher donations as a result of football success. The empirical task is to find additional ways to measure these distinct aspects of what may attract potential students to a college or university. Some suggestions are offered in the following section.

#### IV

#### **Data and Measures**

THE TARGET POPULATION for the current analysis is all colleges and universities competing in the National Collegiate Athletic Association’s Football Bowl Subdivision (previously known as Division IA) or Football Championship Subdivision (formerly Division IAA). As of the fall of 2007, this comprised 119 and 116 institutions with full membership in each subdivision, respectively. This sample is considerably



larger than those used in previous studies of the football advertising effect, where the focus has been primarily Bowl Subdivision schools or a subset thereof. The observations cover the 12-year period between 1994 and 2005. This time frame is consequential, as it straddles the creation of the Division IA Bowl Championship Series in 1998 as well as covering the marked expansion in postseason opportunities via bowl berths.

Three different indicators of the academic quality of the entering class are used as dependent variables. The first is the 75<sup>th</sup> percentile combined verbal and math SAT score reported for those students enrolling in the fall semester. When schools reported only ACT scores, they were converted to the SAT metric using available conversion charts. Second is the percentage of students who had a high school grade point average of 3.0 or better. The last dependent variable is the percentage of the first-year students who graduated in the top 10<sup>th</sup> of their high school class. Note that academic measures based on a student's high school are much more subject to the idiosyncrasies of the particular high school than is the centrally administered Scholastic Aptitude Test. All dependent variables were taken from consecutive years of the *College Board College Handbook*.

Independent variables used here can be divided into four groups: time-varying characteristics of the college or university, fixed attributes of the school, measures of the tradition/culture surrounding the football program, and performance variables that tap the team's success. The size of the college or university is indicated by the total undergraduate enrollment at the school and the number of full-time faculty. Research institutions tend to have both more students and more faculty with research appointments and thus higher values on these variables imply larger student-faculty ratios. To the extent that students with higher academic credentials are drawn to smaller schools, both measures are expected to be negatively related to all three dependent variables.

Schools use financial aid, often in the form of merit scholarships, to attract high-quality students. It is therefore expected that the greater the percentage of students receiving financial aid, the higher the average SAT scores, and percentages of high GPA and top-10 students in the entering class. The academic quality of the college or university

is also a selling point. As in previous studies of the advertising effect, the number of volumes in the school's library is used as a surrogate for the academic orientation of the institution. The financial aid and library variables were taken from various years of the *College Bluebook*.<sup>2</sup> Another measure of the institution's quality is the pay the school gives its faculty. The assumption is that the higher the faculty salaries, the better the institution—a classic case of the “Chivas Regal” effect, where higher cost is assumed to be associated with higher quality. The average salaries for faculty at the level of full professor, associate professor, and assistant professor are included in the models. All salary data come from the American Association of University Professors' annual salary study as reported by the *Chronicle of Higher Education*. The tuition charged by the school is another way schools become branded, via the assumption that higher cost equates to prestige. The cost of attending is measured by the total expense for most years and includes tuition, room, board, and fees.<sup>3</sup> The four economic variables are calculated in real 2004 dollars (in thousands) and all are expected to be positively related to the quality of students attending the school.

Several characteristics of the colleges and universities in the sample are either fixed or treated as fixed over the observation period. A dummy variable for the institution being under public control is used. As private schools tend to be perceived as more prestigious—and those are the ones that are smaller and cost more—this dummy variable should be negatively related to the measures of student quality. Historically black colleges and universities are also flagged by an indicator variable, and this, too, should lead to a negative relationship with the characteristics of the first-year class. Schools with religious affiliation are also identified by a dummy variable, though how religious control should be related to the quality of the entering class is unclear. The research orientation of the institution is measured via two categories of the Carnegie Foundation's new classification scheme (Carnegie Foundation, 2007).<sup>4</sup> Of the eight main classifications applicable to the schools in the sample, the “top” two are used. Research universities with very high research activity are designated by a dummy variable. Those institutions classified as research universities with a high level of research activity are coded as 1 on a second

variable. Given that schools are increasingly using the research university brand as a means of attracting students, we expect that levels of research activity will be positively related to the measures of the quality of the entering class.

Four variables are used to capture the culture and tradition surrounding the school's football program. As discussed earlier, the number of years a school has fielded a team offers a simple measure of the football tradition at the school. This is measured with reference to the first year of observations (1994) and treated as constant for the entire period studied.<sup>5</sup> Per hypothesis, schools with longer football traditions are expected to attract better qualified students.

Markovitz and Hellerman (2001) provide one clue for measuring how engrained the football culture is at the school when they note: "Hegemonic sports culture receives ample representation in other outlets of popular culture such as films, television shows, and, of course, literature" (2001: 11). To tap this phenomenon, the Library of Congress catalog was searched, by school name, for titles about the institution's football program and a simple count was taken under the assumption that the more that was written about the football team at the school, the greater the hegemonic football culture.<sup>6</sup> The count variable was considered to be constant over the observation period, and the total was set to the highest value over the 12-year panel.<sup>7</sup>

A dummy variable indicates membership in the Football Bowl Subdivision. Schools in this subdivision place a greater emphasis on football, especially in terms of expenditures and resources, and to the extent that "big-time" football provides a lure to some students, we would expect this variable to yield a positive coefficient.

Finally, an indicator variable for those schools (including Notre Dame) that are members of conferences with automatic berths in the Bowl Championship Series (BCS) is used. Given that these schools are most often on television and are the subject of the greatest attention in the print and electronic media, the variable is a surrogate for any advertising received. However, these schools are also the ones that historically have emphasized football, are located in geographic regions where football Saturdays are an "event," and have large followings among local and national fans. As such, there is also a culture and tradition component to what is being measured by BCS membership.

Yearly football performance is tapped by three different kinds of variables. First is the most common measure in the advertising effects literature, football winning percentage, and is simply the number of games won divided by the total number of games played over the course of the season. Postseason play can take several forms across the subdivisions, and this necessitates the use of several variables. Appearances in either December or January postseason events indicate participation in the bowls open to Bowl Subdivision schools. Prior to the advent of the BCS, the major bowls were almost always played on New Year's Day or later. After the creation of the Series, the BCS-affiliated bowls continued to be played after the first of the year. The proliferation of postseason opportunities has occurred via games played in December.<sup>8</sup> Teams playing in the Division IAA playoff are indicated by another dummy variable.<sup>9</sup> Given the increased hype surrounding BCS bowls, and the lack of holidays competing for fans' attentions, we would expect January bowl games to produce greater advertising for the participants and thus should have the largest impact if there is an advertising effect drawing better prepared students to the school.

The last time-varying performance measures are designed to capture those conditions that produce the greatest media coverage of a school's season. Winning the mythical national championship for Bowl Subdivision (IA) schools should provide a brief burst of intense advertising for the institution. To a much lesser extent, the same can be expected for winning the playoff subdivision (IAA) championship. A more nuanced measure attempts to capture how programs can quickly become "media darlings" by reversing years of futility on the field or by making it to postseason play for the first time after a long absence. Doing so provides an easy narrative for the media, one that should yield considerable advertising for the college or university. Toma and Cross (1998) find evidence that breakout years do indeed produce bumps in applications as would be expected under the advertising effect hypothesis. A dummy variable for having a "breakout" season is used to measure such campaigns and is given a value of 1 if the school has a winning season for the first time in 15 or more years, makes its initial bowl/playoff appearance, or returns to post-season play after a 15-year stretch of no bowl or playoff invitations.<sup>10</sup>

Unfortunately, the panel is not perfectly balanced, as missing data, movement into the subdivisions, and different lag structures take their toll. When the dependent variable is the 75<sup>th</sup> percentile for SAT scores of the first-year class, the case base is 233 programs with schools having between 1 and 11 years of data when performance measures and school characteristics are lagged for one year. Those models average 7.7 years of observations. The high school credentials of the entering class are less well reported. Thirty schools (13 percent) are lost either due to missing data on the percentage of freshmen with a high school GPA of 3.0 or better or because the program had not been competing in one of the subdivisions for more than two years and thus a two-year lag for performance effects could not be tested on those schools. When the dependent variable is the percentage of entering students in the top 10 percent of their high school class, the case base is 213 schools (a drop of 9 percent). An average of 6.5 and 7 years of data are available for the last two dependent variables and, as will be seen, the case base is sufficiently large to detect significant effects in all models.

## V

**Model and Results**

THE ANALYSIS PROCEEDS via a series of random effects GLS models, which are summarized in Table 1. Each dependent variable is first regressed against the set of school characteristics (Model A). This baseline model is then augmented by the indicators of the football program's tradition and culture (Model B). The various measures of the team's performance are then added to Model B and tested separately, first by winning percentage (Model C), then by the three forms of postseason appearances (Model D), and finally by the three kinds of notable accomplishments (Model E).

Note that a series of trend dummy variables for year are included in the model, though those coefficients will not be reported.<sup>11</sup> All time-variant school characteristics were lagged one year, as were football performances defined by winning percentage and highly successful breakout years.<sup>12</sup> Given that the published data for schools are reported for the previous year (e.g., the characteristics for the entering

Table 1

Summary of Random Effects GLS Estimates with Robust Errors  
for Academic Characteristics of the First-Year Class

Variable	75 Percentile SAT Score	Percentage with High School GPA 3.0 or Better	Percentage from Top 10 <sup>th</sup> of High School Class
MODEL A (School Characteristics)			
Intercept	1,133.164* (30.76)	57.368* (6.70)	4.929 (6.44)
Undergraduate enrollment <sub>t-1</sub>	-0.097* (-0.05)	0.002 (0.01)	0.008 (0.01)
Full-time faculty <sub>t-1</sub>	-0.000 (0.00)	0.002* (0.00)	-0.002* (0.00)
Percentage of students receiving financial aid <sub>t-1</sub>	0.090 (0.08)	-0.015 (0.02)	0.032* (0.01)
Number of volumes in library <sub>t-1</sub>	0.001 (0.00)	0.000 (0.00)	0.000 (0.00)
Average full professor salary <sub>t-1</sub>	1.447* (0.38)	0.147† (0.08)	0.296* (0.07)
Average associate professor salary <sub>t-1</sub>	-0.371 (0.56)	0.100 (0.11)	-0.140 (0.11)
Average assistant professor salary <sub>t-1</sub>	0.382 (0.59)	-0.036 (0.13)	0.276* (0.11)
Total costs to attend <sub>t-1</sub>	1.080* (0.52)	0.093 (0.11)	0.150 (0.10)
Public institution	-111.938* (15.81)	-5.964† (3.58)	-18.674* (3.56)
Historically black institution	-145.547* (17.05)	-28.535* (3.57)	-6.826 (4.85)
Religious affiliation	-26.374† (15.19)	3.027 (3.61)	-4.528 (3.68)
Research university with very high research activity	129.269* (13.23)	14.343* (3.01)	17.475* (3.08)
Research university with high research activity	55.492* (10.91)	7.729* (2.54)	3.921 (2.73)

Table 1 *Continued*

Variable	75% Percentile SAT Score	Percentage with High School GPA 3.0 or Better	Percentage from Top 10 <sup>th</sup> of High School Class
MODEL B (Adding Culture, Tradition, and Level of Competition to Model A)			
Years playing football (at start of panel)	0.834* (0.15)	0.088* (0.03)	0.108* (0.04)
Number of books written about school's program	1.921* (0.77)	0.345† (0.19)	0.438 (0.45)
Bowl Subdivision (IA) membership	-21.283* (9.61)	0.697 (2.99)	-2.432 (3.27)
Bowl Championship Series conference membership	18.296* (7.48)	1.234 (2.06)	1.384 (1.09)
MODEL C (Adding Winning Percentage to Model B)			
Winning percentage for season <sub>t-1 or t-2</sub>	2.489 (4.09)	1.974* (0.86)	-0.775 (0.85)
MODEL D (Adding Postseason Appearances to Model B)			
January bowl appearance <sub>t-1 or t-2</sub>	1.122 (2.98)	2.084* (0.72)	0.976 (0.79)
December bowl appearance <sub>t-1 or t-2</sub>	0.084 (2.67)	1.123* (0.49)	0.142 (0.56)
Championship playoff appearance <sub>t-1 or t-2</sub>	3.157 (6.17)	1.267 (0.83)	-0.088 (0.59)
MODEL E (Adding Notable Accomplishments to Model B)			
Won national championship (IA) <sub>t-1 or t-2</sub>	-17.289 (15.34)	-0.878 (2.00)	-0.866 (2.06)
Won playoff championship (IAA) <sub>t-1 or t-2</sub>	3.678 (5.98)	2.960† (1.55)	0.478 (1.11)
Had a breakout season <sub>t-1 or t-2</sub>	12.660* (4.81)	0.220 (1.53)	1.387 (1.47)

*Note:* All models include T-1 dummy variables for year. Football performance variables are lagged one year when SAT and percentage top-10 students are the dependent variable, two years when percentage with a 3.0 GPA is the dependent variable. Standard errors are given in parentheses.

\* $p < 0.05$ .

† $p < 0.10$ .

class usually refer to the year prior to the publication date), this effectively tests how a football team's success influences the composition of the class the following fall.<sup>13</sup> Initial runs using the percentage of first-year students with a GPA of 3.0 or better as the dependent variable found that it took a two-year lag for any performance effects to emerge, and those will be the ones reported. The implications of this anomaly are discussed later.

The characteristics of the college or university account for the vast proportion of systematic variation—the pseudo  $R^2$  for Model A is 0.69—and most of the systematic variation lies between schools, not within them over the 12-year observation period. The larger the enrollment at the institution, the lower the 75<sup>th</sup> percentile of SAT scores, with each additional 1,000 students lowering the class's profile by one point. (The effect is only significant at the 0.10 level after the football variables are entered.) As in other studies, higher faculty salaries draw better students, with an SAT increase of about 1.4 points per \$1,000 paid to full professors. The total cost of attending the college or university has a similar effect, with the SAT scores raised by 1.08 points per \$1,000. Both these economic variables support the presumed perception that higher institutional costs are associated with better institutional quality. No other time-varying independent variables influence the SAT scores of the entering class.

Public schools draw first-year students with a 75<sup>th</sup> SAT percentile that is, on average, 112 points lower than those at private colleges and universities. Being a historically black institution also lowers the academic profile by over 140 points on the combined SAT scale. The effect for schools with a religious affiliation in Model A ceases to be significant once the athletic variables are introduced. Research universities attract better students, with the SAT profile raised by over 125 points at schools with very high research activity and 55 points at schools with high research activity.

The football program at a school does indeed influence the composition of the first-year class, as shown in Model B. Each year the school has played football (i.e., "tradition") raises the SAT scores by 0.83 points. Football culture, as measured by books written about the program, matters as well, with 75<sup>th</sup> percentile scores rising by almost 2 points for each book published. The football competition



variables produce conflicting results. Schools that play in the Football Bowl Subdivision have, all else equal, first-year students with SAT scores 21 points lower than those playing at the Football Championship level. Being a member of a “power” conference (BCS) essentially compensates for this drop by raising scores by 18 points. These four aspects of the football program raise the explained variance by 4 percent.

The yearly fortunes of the football team are less strongly related to the SAT scores of first-year students. Neither the winning percentage (Model C) nor postseason appearances in a bowl or the Championship Playoff (Model D) have significant impacts. Winning championships (Model E) also do not influence this form of student quality. Memorable seasons, however, do appear to produce positive advertising for the school. As Model E shows, the 75<sup>th</sup> percentile SAT score is increased by over 12 points in the class after a breakout season.

When the high school grade profile of the entering class is used as the measure of student quality, a different story emerges.<sup>14</sup> First, the set of models in Table 1 account for less of the variation in the percentage of first-year students with a high school grade point average of 3.0 or better, as the pseudo  $R^2$  is 0.5. However, much more of the systematic variation lies within institutions—the within-school  $R^2$  is estimated to be 0.38. This suggests that at least some aspects of student quality may be more responsive to year-to-year changes in the on-field performance of the football team, as the performance measures are potentially the most variable aspects of the models being estimated.

Second, the GPA measure is less responsive to the characteristics of the school (Model A), as fewer variables are significant. The size of the faculty matters, with every 10 additional faculty raising the percentage of B or better students by 0.02, and full professor salaries continue to remain predictive, though only at the 0.10 level of significance. Being a public institution drops the percentage of these students by about 6 percent, and historically black schools have an even larger drop of 28 percent. Research universities continue to have an attraction for quality students as defined by high school grade point averages. Fourteen percent more students with higher GPAs are found at very high research activity colleges and universities, with an effect about

half that size seen for institutions with a high level of research. Both of the effects for research status are, however, attenuated when the variables for football competition are introduced, dropping to 10.21 ( $p < 0.05$ ) and 4.68 (n.s.), respectively.

Two components of the school's football culture and tradition are related to the percentage of students with a high school 3.0 GPA or better in the first-year class. Every 10 years of football tradition increase this aspect of the freshman class profile by 0.8 percent. Each previous book about the school's football program leads to an increase by about one-third of 1 percent. Both effects are quite small. Coupled with the lack of impacts for Bowl Subdivision competition and BCS membership, we see few positive results for cultural influences on the quality of entering students.

As mentioned previously, using a two-year lag for football success allows some advertising effects to emerge. Increases in the football team's winning percentage (Model C) can add a greater percentage of higher GPA students to the first-year mix. For Division IA teams, bowl appearances also significantly boost the quality of entering students, with January bowls producing a 2 percent boost in the GPA measure and December bowls a 1 percent increase (Model D). Winning the IAA championship raises the percentage of B or better students by almost 3 percent (though the effect is significant at only the 10 percent level). However, neither finishing first in the national standings (for IA teams) nor having a breakout season attracts these types of students.

The last column of Table 1 offers results for the third measure of student quality. Like the results for high school GPA, variation in the percentage of entering students from the top 10<sup>th</sup> of their class is less easily explained as the different models account for roughly 56 percent of the variation. Like the findings for the 75<sup>th</sup> percentile of SAT scores, the vast majority of systematic variation lies between institutions (an  $R^2$  of 0.55) rather than within them (an  $R^2$  of 0.06). Thus, the measure may be telling us something different about the academic composition of the first-year class.

Schools with larger faculties appear less attractive to students from the top of their high school class. Financial aid can clearly be used as a recruiting tool, with each additional 10 percent increase in students receiving aid translating to a one-third percentage increase in top-10

freshmen. Every \$1,000 increase in full professor salaries raises the percentage of students from the top of their high school class by one-third of a percent, with the average salaries for assistant professor now having a comparable impact. No other time-varying school characteristics are significant in Model A or subsequent equations. Public schools continue to have lower values on these indicators of student quality, now dropping the percent of top-10 students by over 18 points. Research universities with very high research activity remain a draw, as this characteristic raises the profile of the first-year class by 17 percentage points. Other characteristics of the college or university, while significant for other dependent variables, have no influence on the last measure of student quality.

Evidence for a football tradition or advertising effect is scant when high school top-10 standing is the measure of student quality. The football tradition itself draws these kinds of top students, with every year of competition increasing the mix of the first-year class by 0.11 percent. After that, no other tradition, culture, or football performance variable reaches statistical significance in Models B through E.

## VI

### **Discussion and Conclusions**

THE RESULTS HERE lead to the inescapable conclusion that some portion of the college-seeking high school population is drawn to schools offering big-time college football in either the Bowl or Championship Subdivisions. Positive, significant influences of the football program were found for all but one of the indicators of competition and performance for at least one measure of student quality. Schools with longer football traditions and established cultures have first-year students with better academic credentials. Consistent with a presumed advertising effect and the branding of the school's football program, SAT scores and percentages of students with B or better GPAs or top-10 standings rise when schools have seasons that could lead to greater media coverage. At first glance, there is much support for the claim that a successful football program can raise the quality of entering students and thus the academic profile of the institution as a whole.

The current findings do, however, suggest several caveats to such conclusions. First, one must be careful about results based upon samples consisting primarily of schools in BCS conferences. Looking at only schools with “power” programs hides several results that come from analyzing a broader range of institutions. Yes, BCS membership is associated with an improved quality for the entering class at the institution (but only when SAT scores are used), though this effect could not be seen in a truncated sample as it would be relegated to the intercept of the models estimated. The negative insight from the more inclusive sample is that membership in the highest level of competition is shown to *lower* this same outcome as Football Bowl Subdivision (Division IA) schools tend to enroll students with combined SAT scores below those playing a less visible form of football.

Second, the advertising effect is presumed to be greatest when teams have “successful” seasons, and this expectation is at least partially borne out for several empirical definitions of “success.” While the effects are inconsistent across the various forms of student quality studied, winning, bowl appearances, and the Division IAA championship can increase the academic profile of the entering class. Thus there is at least some evidence that a school’s brand awareness grows with the seasonal fortunes of its football team. Breakout football seasons also produce the expected effect in that the rise in the 75<sup>th</sup> percentile score is relatively large, 12 points on the combined SAT scale. But using this positive outcome as a justification for having big-time football to improve the academic mission or spending money to upgrade facilities and ultimately improve the quality of the undergraduate study body appears to be fool’s gold. Given the stringent definition of the breakout measure—15 years of losing or no bowl appearances—a school may have to go through years of futility to reap any benefits. The expenses incurred during this time could not possibly outweigh the one-time benefit from the splashy success, and there is little evidence that schools are able to sustain this boost via the other athletic variables tested here. It should also be remembered that neither of the other measures of student quality were significantly influenced by a breakout season.

It is the more stable, and less malleable, aspects of football programs that provide the relatively consistent influences on the aca-

demographic makeup of the entering class. The number of years playing football (“tradition”) has a positive impact on all forms of measures of student quality studied here. The ingrained football culture as measured by books about the school’s program, some published over half a century ago, also raises student quality as indicated by the 75<sup>th</sup> percentile SAT score and GPA outcomes. These positive effects attributable to the sports program need, however, to be put in context. Take the values estimated for the coefficients in Table 1 at face value for a moment. A school that has been playing football for 75 years receives an increase of 63 points in first-year SAT scores. If this school’s program is literally storied through 10 books, an additional increase of 19 points can be expected. BCS membership can bring about another increase of 18 points. A 100-point jump in the 75<sup>th</sup> percentile of SAT score is considerable and swamps any increase that can be attributed to the on-field performance of the team. While the metrics differ, the same conclusion is reached using the other measures of student quality.

Hence the claim that the football culture and tradition at the school are much more important in attracting well-prepared students than the advertising produced during a given season. This is consequential for those wishing to use intercollegiate football to raise the academic profile of the institution. Schools cannot easily move into BCS membership, nor can they quickly invent the tradition and culture reflected by long-standing competition and fan interest. Colleges and universities that have already done so have a distinct advantage in recruiting any students drawn by athletic programs. While it certainly is possible to develop more culture and tradition at an institution, it is a long-term process, and latecomers are playing a game of “catch up” in which they are unlikely to overtake those ahead of them in the culture/tradition queue.

Moreover, there is evidence for some heterogeneity in how potential students respond to the football culture and success at these colleges and universities, and this could further dilute the potential gains from advertising and branding. Those students with the better academic credentials (especially as measured by the SAT scores) seem to respond to the fixed and stable aspects of the school’s football program such as longer football traditions, more engrained

football cultures, and competition at the most elite level of “big-time” football. In contrast, the percentage of entering students with a high school GPA of B or better potentially includes a pool with lower test scores and high school standing than captured by the other dependent variables. As hypothesized by an advertising effect, this group of students responds to winning and bowl appearances, applies to the school, is accepted, and attends. What is intriguing is that, unlike the other forms of student quality, B or better students are influenced by athletic performance two years removed. This suggests that one subset of potential applicants adds visibly successful programs to the list of schools they will consider during their junior year of high school. Those schools remain on the applicant’s list when it comes time to go through the application process. Future research should investigate if any advertising produced by football performance differentially impacts subgroups of the college-seeking population. If so, uniform positive benefits across the target audiences cannot be assumed.

Some will be relieved by the fact that the positive influences we have seen for football programs are dwarfed by the impact of the characteristics of the school itself. Continuing the reliance on the coefficients from Table 1, a school that pays its full professors the average salary in this sample (\$90,000) raises the SAT profile of its entering class by 130 points. If costs are \$35,000, scores rise by another 32 points, and another 129-point increase comes if the school is a research university with very high research activity. Of course, there are countervailing influences depending upon whether the school is public or historically has served a black or religiously oriented undergraduate population. But, not surprisingly, the magnitude of all of these influences is much greater than any attributable to the advertising generated by the fortunes of the football team, or even the more predictive cultural/traditional standing of the program.

In sum, there is some evidence to support the marketing claims made by proponents of spending on big-time football programs. Advertising effects, albeit small ones, can be shown for the on-the-field performance of the team. Larger impacts can be seen for the more stable football culture and tradition that exist at some big-time

schools. While real, these effects exist at the margins of what draws individuals to a college or university. Of more import are academic reputation, the perceived (if not real) quality of the institution, and economic considerations of cost and aid. A focus on these aspects of the school would be a more effective recruiting tool.

### Notes

1. The organizational structure of competition has changed greatly over the years. The truly “big-time” programs are now located in Division IA, which is seen as the highest level of competition. Within this group are the so-called power conferences with easier access to the major bowls via the Bowl Championship Series. Other schools compete at Division IAA where expenditures, and exposure, are generally less. Division IAA schools are eligible to participate in a 16-team playoff that crowns a national champion at that level. The NCAA recently renamed the two divisions, with Division IA now called the Football Bowl Subdivision and Division IAA now the Football Championship Subdivision. Interestingly, the change was motivated in part by the brand confusion produced among IAA schools whose other sports programs were somehow seen as less than “Division I.”

2. The *Bluebook* was a biannual publication prior to 1999. For the gaps in these variables during the earlier portion of the observation period, the value from the prior year was used to replace missing data.

3. For a few years, the cost variable is the total of tuition, room, and board only. For public schools, in-state tuition was used under the assumption that in-state students comprise the largest proportion of the entering class. As noted by an anonymous reviewer, the cost of attending may not be strictly exogenous, especially if it results in an additional form of branding for the institution.

4. The Carnegie classification system has changed several times over the years covered by the current study. Unfortunately, newer versions are not backward compatible with older ones and thus it is not possible to create a time-varying version of the research orientation of the institution. Further details about the changes and the schools falling into each category can be found at the Foundation’s website ([www.carnegiefoundation.org](http://www.carnegiefoundation.org)).

5. Allowing this variable to increment yearly after the start of the panel adds no additional information to it.

6. This measure has considerable face validity. Two-thirds of the schools in the sample have had no books written about their football program, despite the average of 1.77 books per school. The University of Notre Dame tops the list with a staggering 36 different books published about its football program—this total does *not* include books about famed coaches or players. Other schools with high values are the universities of Alabama, Nebraska, and

Michigan and the Ohio State University. The measure also captures the genesis of college football as Harvard, Yale, and the U.S. Military Academy have nonzero counts.

7. One consequence is that for some schools, a book published in, say, 2005 would still be included in the school's count for 1994. The argument for doing so is that any culture surrounding a football program should evolve, or disintegrate, slowly. Allowing the variable to change via publications released during the 12 years of the panel runs counter to the concept being measured.

8. The difference between January and December bowls is both substantively and economically significant. Between the 1994 and 2005 seasons, postseason slots in the higher-paying January bowls ranged between 14 and 20. During that time, there was a statistically significant ( $p = 0.030$ ) increase in December bowl opportunities. Twenty schools played in a December bowl at the end of the 1994 season, and this number steadily increased to 40 by December 2005.

9. The bowl variables are thus effectively interactions between level of competition and postseason play.

10. Approximately 1 percent of all seasons are defined as breakout ones under these criteria. Using the less stringent time frame of 10 years doubles the number of such seasons, though this did not change the results when SAT scores or top-10 class ranking were the dependent variables. The shorter time frame for the breakout definition did, however, considerably weaken the findings when high school GPA was the dependent variable. The implications are that any advertising that accrues from a football success requires a truly exceptional season and that the results presented should be interpreted as the upper bound for the impact of breakout seasons.

11. The year variables attempt to control for any number of trends that might influence the relationships studied. These include differences in the size or quality of the yearly cohort of college applicants, economic fluctuations that might delay some students' college attendance, and short-term changes in football interest and media coverage.

12. Preliminary runs not shown found no differences in conclusions and negligible differences in coefficients when school characteristics and football winning percentage or having a breakout season were set to two-year lags.

13. When students apply during the fall, any advertising effects from a football season might influence only the choice among acceptances from schools to which the individual had already applied. Bowl appearances, for example, may come after the formal application cycle, and this is even more likely for students making use of early admission programs. The advent of rolling admissions further complicates the selection of an appropriate lag structure, as prospective students may apply year-round to some schools. While preliminary runs suggest that the present findings are not sensitive to



use of longer lags (see note 12), the choice of the appropriate lag remains an issue for future research in the advertising effects literature.

14. As noted by an anonymous reviewer, portions of this measure, and that for percentage from the top 10<sup>th</sup> of their high school class, are subject to state policies conditioning acceptance standards either via proportions of in-state versus out-of-state students or guaranteeing acceptance to students with a certain high school average. This may be one reason why we find negative effects for being a public institution on all dependent variables.

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