

**The Flutie Effect:
The Influence of College Football Upsets and National Championships
on the Quantity and Quality of Students at a University**

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Abstract: Using a panel study of universities, we find a positive correlation between winning either an upset victory or a national championship in football and the number of applications and students enrolling at the successful university. Surprisingly, we also find that winning a national championship decreases the number of top tier students who choose to attend the university, while there is no statistically significant relationship between an upset win and the quality of incoming students at a school. Overall, our results suggest that athletics serve as a consumption amenity, leading students to apply and enroll at the victorious university.

Introduction

In 1984 Boston College quarterback Doug Flutie threw a Hail-Mary touchdown pass against the University of Miami, giving Boston College an unexpected upset victory. In the two years following this win, applications to Boston College increased by 30 percent (Chung 2013). This phenomena has subsequently become known as the “Flutie Effect.” In 2007 Appalachian State University blocked a field goal in the final seconds of a game against the University of Michigan securing another iconic upset victory. After the win Appalachian State experienced their own “Flutie Effect” where applications increased 15% the year after the upset, a number that was sustained through 2010 (Hansen 2011). The same effect on applications has also been linked to college football championships. Toma and Cross (1989) found a notable increase in applications both in absolute terms and relative to peer schools following a national championship victory.

To test the influence of athletic success in football on both student applications and enrollment, we utilize data on NCAA football championships and upsets as measured and published by a well-known Sports Mathematician Kenneth Massey. We choose the Massey method because it is a computer generated rating system and not a subjective measure of an upset victory. Using a thirteen year fixed-effects panel model, we analyze the “Flutie Effect” on both the incoming quantity and quality of students at a university that experiences either a college football upset win or national championship.

Literature Review

Several studies have examined the impact that playoff and championship victories have on a university. Toma and Cross (1998) studied the impact of winning an NCAA National Championship in football or in men's basketball on the quantity of applications submitted to a school. They found a positive increase in the number of applications received by a school after a National Championship win. Pope and Pope (2009) further identified that a school's success in football or men's basketball, as measured by a top 16 ranking in basketball or a top 20 ranking in football, is accompanied by an increase of 2% to 8% in applications received at the school. Examining the SAT scores of these applicants, Pope and Pope (2008) discerned that the increase was comprised of both low and high scoring applicants.

Additional studies have found that athletics have the tendency to bolster the quality of students that enroll at a university. Smith (2009) discovered that increases in student quality are a function of the sports culture and tradition surrounding a school. McCormick and Tinsley (1987) identified a positive correlation between a winning football season and an increase in the incoming year's freshman SAT scores. Murphy and Trandel (1994) found that an improvement in a school's football record increased the number of applicants to that school. While Mixon, Trevino and Minto (2004) and McEvoy (2005) both discovered a positive relationship between football win percentages and applications received, supporting the idea that collegiate football impacts the institution's admissions process.

In a more recent study Segura and Willner (2018), analyzing how Bowl Game invitations affected median SAT scores, found the scores increased at the participating universities. Their study outlined how regular season wins had little effect on admissions, but the advertising effect from a FBS Bowl Game increased total number of applications and median SAT scores by 8-21

points. Similarly, Jones (2009) found that simply appearing in a Bowl Game caused an increase in applications received and admission yield, but only for male students, and also found that the applications received and admission yield for both male and female students were positively related to the Nielsen Rating of the Bowl Game.

Segura and Willner (2018), focusing on football Bowl Game invitations, discovered that invitations served to increase the median SAT scores at the participating universities. However, Smith (2008) discovered that success in Division One basketball did not influence the proportion of students from the top ten percent of their class, or the proportion of National Merit Scholars, attending the university. Tucker and Amato (2006) found that there was no consistent evidence to suggest a highly successful basketball team influencing the average SAT scores at a university. Pope and Pope (2014) determined that when a university has a banner year in either football or men's basketball the average SAT test scores sent to that university increased by ten percent. Chung (2013) showed that lower scoring students have a higher preference for athletic success than do higher achieving students with better SAT scores. Caudill, Hourican and Mixon (2018), examining the elimination of a football program at a university, found that the applicant pool decreases and the average ACT test scores fall when the football program is eliminated. Overall, the literature suggests that athletic success positively influences both the quantity and quality of students at a university.

To our knowledge there have been no studies, beyond case studies, that have analyzed the influence of upsets on a university's applications, enrollment and student quality. In one case study at Appalachian State University, following their upset win over the University of Michigan, found a 25% increase in the total number applicants two years succeeding the win, with a diminishing influence in the third year after the upset. (Trivette n.d.) One difficulty in

analyzing the influence of an upset win on a university is selecting how to identify which win would qualify as an upset. To avoid the subjectivity of assigning upset wins, we have identified an upset win using a system developed and published by well-known Sports Mathematician Kenneth Massey. The "Upset" score is the level of "extremeness" of the games per Massey's methodology¹.

Data

To test the impact of an upset win, we use data on 122 Division I football programs for thirteen seasons from 2000 to 2013. This sample represents all NCAA Division I FBS (formally D-IA) schools from the Atlantic Coast Conference (ACC), the Big 12 Conference, the Big 10 Conference, Conference U.S.A., the Mid American Conference (MAC), the Mountain West Conference, the PAC 12, the Southeastern Conference (SEC), the Sun Belt Conference, the Western Athletic Conference and the Ivy League Conference. These schools also represent the universities with the highest athletic budgets. We then matched these schools with a data set licensed from Peterson's Data that contained data on freshman applications, admissions, enrollment, as well as student quality as measured by mean SAT test scores and the number of freshman enrollment from the top ten and twenty-five percent of their high school class.

The Massey Upset and championship data was cross referenced with the Peterson Institutional dataset to create a master dataset from which the descriptive statistics and analyses are derived. When trimmed to include only FBS Division I schools for the 13 years of

¹The Massey Upset Rating number mimics the idea of an inverse p-value. The higher the number the greater the extremeness of the upset. For example, a Massey Upset rating of 150 corresponds to a p-value of 1/150 on the null hypothesis, meaning that teams were rated correctly prior to that game. Details of the Massey Rating Methods can be found at <https://www.masseyratings.com/theory/massey.htm#overview>. We included all Massey scores over 140 in our data set.

longitudinal data, the dataset included 21 upset wins. In the Massey dataset, upsets are ranked in order of an upset coefficient labeled “Massey Rank”. This coefficient was developed by Kenneth Massey and assesses an upset on the winners’ rank at the end of the season, strength of schedule and competitive parity. A comprehensive list of the upset winners can be found in Table 1A. In table 1B we list all the schools who were considered National Champions at the end of the season. Due to the nature and timing of a football season, our upsets are reported in the fall of the season, while football championships are reported in the spring of the following year. Therefore, an upset in the 2009-2010 season is listed in 2009, while the national championship is listed in 2010.

The dependent variables we used were from the Peterson Undergraduate data set, which provided our measure of freshman applications, admissions, and enrollment. We also examine student quality at these universities by the percentage of the incoming freshman class that were in the top ten percent and in the top twenty-fifth percent of their high school class, as well as their average SAT score.

Methods and Results

Using a fixed effect regression technique to control for differences between universities and over time, we analyzed how an NCAA football upset influenced applications, admissions and enrollment as well as the quality of students enrolled at these schools. The university fixed effect controls for all university characteristics that are time invariant including whether the school is religious, private or public. To control for changing University quality over time we included the university’s endowment as a control variable. To control for athletic quality we used the yearly win percentage of the football team.

Additionally, we used year fixed effects to control for changing demographics of students and macro-economic conditions that change over time. The model we estimate is:

$$1) Y_{it} = \beta_1 \text{Win\%} + \beta_2 \text{Upset} + \beta_3 \text{lagUpset} + \beta_4 \text{lag2Upset} + \beta_5 \text{Champion} + \beta_6 \text{lagChampion} + \beta_7 \text{lag2Champion} + \beta_7 \text{Endowment} + \beta_i \text{University} + \beta_t \text{Year} + \varepsilon$$

We report the means and standard deviation of both the dependent and independent variables in Table 2. The mean football win percentage at the schools was .505 (slightly higher than .500 because these schools also play some games against other schools outside our dataset). The mean number of applications received was 14,002. The number of freshman admitted is on average 7,919. The number of average freshman enrolled is 3,370. To account for differences in size between the universities studied, we log the number of applications, admissions, and enrollment in our regression analysis. In terms of measuring student quality, we found that 34% of freshman enrolled came from the top ten percent of their high school class and 58% of freshman came from the top twenty-five percent of their high school class. We also found that the mean grade point average of enrolled freshman was 2.57 and the mean SAT score was 998.²

We report the results that football upsets and championships have on student enrollment and quality in Tables 3 through 4. In table 3, we delineate the influence of upsets and championships on applications, acceptances, and enrollments. To help clarify our results, we convert the coefficient on the log variable to a percentage using the formula $100[\exp(\beta) - 1]$, where β is the coefficient on the relevant dummy variable.

Our results show that a football upset increases applications by 6.6% one year after the upset and 7.1 % two years after the upset. In addition, the upset increases admittances to a university by 6.0% one year after the upset. Lastly, an upset increases a universities enrollment

² The mean score was determined by summing the mean SAT verbal score of 490 and the mean SAT mathematical score of 508. When analyzing the scores separately the results did not change.

by 5.9% the year after the upset and 7.2% two years after the upset. Our results further show that applications to a university increase 7.1% the year of the championship. However, while a championship has no effect on the overall admissions to the university, it does increase enrollment 6.5 percent the year of the championship and 5.2 percent the year after the championship. Our results indicate that the “Flutie Effect” exists for universities for both a football upset and a football championship.

Our findings further suggest that unlikely athletic success through an upset victory increases the number of applications to a university, and with the larger pool of applicants, the university chooses to admit more students. Alternatively, championships do not influence the admittance decisions by the university. Therefore, when a university wins a national championship or an upset, it appears that a larger number of admitted students then then choose to enroll in the university. In terms of magnitude, the “Flutie Effect” leads to an average of 196 more students enrolling at a university the year after the upset and 237 more students enrolling two years after the upset. Furthermore, a national championship increases enrollment by 213 more students the year of the championship and 170 more students the year after the championship.

In Table 4, we report the results of an upset win on the quality of freshman students enrolled at a university. For all measures of student quality, we find no statistically significant effects following an upset victory. Interestingly, however, winning a national championships reduces the percentage of students from the top ten or top twenty-five percent of their high-school class that choose to attend the university. This result is consistent with a recent study by Jacob et al. (2018) that found students place a high value on consumption amenities, such as student activities, sports, and dormitories when choosing a college. In their view, universities

serve as country clubs that not only provide academic services, but also consumption amenities to their students. Their study finds that the heterogeneity in student preferences account for the variation of academic amenity spending across universities. These different preferences have led some schools to draw students to their door by offering football and basketball programs that enhance the student experience. However, their study also found that high achieving students are less influenced by the sports amenities when considering a university.

Discussion and Conclusions

University athletic programs are uniquely situated to serve as a visible and accessible liaison between a school and the general public. This relation has led to the metaphor “Athletics truly is a front porch to the University. It is not the most important room in the house but it is the most visible and what comes with that is opportunity and responsibility.” as stated by Scott Barnes the University of Pittsburgh Athletic Director in 2015. Further, in their recent article on NCAA organization, Sanderson and Siegfried (2017) observe: “When universities incur financial losses on athletics, universities seem to double down, spending even more on salaries for coaches and improving physical facilities, rather than viewing losses as a signal to redeploy assets and efforts.” They conjecture that increased athletic spending could attract greater appropriations from state legislators; boost private donations to the university; and attract more applicants and increase enrollment. Our findings on football championships and upsets are consistent with the Sanderson and Siegfried (2017) hypothesis, finding that winning either a national championship or an unexpected upset victory has a positive impact on the number of applications received and on the number of students opting to enroll at the victorious university.

Surprisingly, we also find that elite quality students are less likely to attend a university after a national championship victory, while upset wins have no influence on the quality of those students entering the institution. Ultimately, these results show that winning an upset victory or a national championship in college football increases the amount of media attention a school receives, which then allows the university to be the beneficiary of an advertising effect. This additional advertising or “Flutie Effect” translates into measurable increases in applications and enrollment for the school, further strengthening the correlation between university athletics and the overall advancement of the institution.

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Table 1A: Upsets

| <u>Massey*</u> | <u>Date</u> | <u>Rank</u> | <u>Winner</u> | <u>Score</u> | <u>Rank</u> | <u>Loser</u> | <u>Score</u> |
|----------------|-------------|-------------|-------------------------|--------------|-------------|----------------|--------------|
| 714 | 11/16/02 | 114 | Army | 14 | 66 | Tulane | 10 |
| 468 | 10/6/07 | 62 | Stanford | 24 | 2 | USC | 23 |
| 240 | 10/13/01 | 33 | Auburn | 23 | 2 | Florida | 20 |
| 239 | 11/17/11 | 34 | UAB | 34 | 24 | Southern Miss | 31 |
| 227 | 12/1/07 | 52 | Pittsburgh | 13 | 3 | West Virginia | 9 |
| 218 | 10/11/08 | 114 | New Mexico State | 48 | 69 | Nevada | 45 |
| 209 | 9/20/03 | 49 | Marshall | 27 | 12 | Kansas State | 20 |
| 193 | 10/22/11 | 41 | Texas Tech | 41 | 8 | Oklahoma | 38 |
| 190 | 9/1/08 | 79 | Fresno State | 24 | 30 | Rutgers | 7 |
| 180 | 9/22/07 | 99 | UNLV | 27 | 32 | Utah | 0 |
| 174 | 10/11/03 | 21 | Florida | 19 | 2 | LSU | 7 |
| 173 | 9/29/12 | 70 | MTSU | 49 | 41 | Georgia Tech | 28 |
| 168 | 8/31/02 | 98 | Louisiana Tech | 39 | 30 | Oklahoma State | 36 |
| 164 | 10/21/00 | 111 | Connecticut | 38 | 90 | Akron | 35 |
| 152 | 10/24/09 | 59 | Iowa State | 9 | 17 | Nebraska | 7 |
| 152 | 11/11/00 | 110 | Central Mich | 21 | 49 | Western Mich | 17 |
| 149 | 11/18/11 | 37 | Iowa State | 37 | 3 | Oklahoma State | 31 |
| 149 | 10/24/09 | 57 | Texas A&M | 52 | 24 | Texas Tech | 30 |
| 147 | 10/6/01 | 87 | Kansas | 34 | 41 | Texas Tech | 31 |
| 145 | 9/22/07 | 88 | Syracuse | 38 | 41 | Louisville | 35 |
| 144 | 11/24/01 | 60 | Oklahoma State | 16 | 10 | Oklahoma | 13 |

***Massey Upset Score:** The "Upset" score is the level of "extremeness" of the games per Massey's methodology. The higher the number the more extreme the upset. The link for our first year of measured upsets is www.masseyratings.com/extgms?s=cf2000&x=U then the date listed in the link changes chronologically for each year between 2000 through 2012.

Table 1B: Championships

| Year | School |
|-------------|--------------------------------------|
| 2000 | Oklahoma |
| 2001 | Miami (Florida) |
| 2002 | Ohio State |
| 2003* | Louisiana State, Southern California |
| 2004 | Southern California |
| 2005 | Texas |
| 2006 | Florida |
| 2007 | Louisiana State |
| 2008 | Florida |
| 2009 | Alabama |
| 2010 | Auburn |
| 2011 | Alabama |
| 2012 | Alabama |
| 2013 | Florida State |

* In 2003 there was no consensus champion so both the co-champions are included.

Table 2: Means

| Independent Variables | Mean (Standard deviation) |
|------------------------------|---------------------------------------|
| Football Win Percentage | .515 (.224) |
| Endowment | \$958m (213m) |
| Dependent Variables | Means (Standard deviation) |
| Freshman Application | 14,002 (8,858) |
| Freshman Admittance | 7,919 (4,741) |
| Freshman Enrollment | 3,270 (1,669) |
| Top 10% High School | 34% (25) |
| Top 25% High School | 58% (27) |
| Mean S.A.T. Score | 998 (423) |

Schools=122 Years=13

Table 3: Influence of Football Successes on the Quantity of Students

| | Log Applications | Log Admissions | Log Enrollment |
|-------------------------|------------------|------------------|------------------|
| Football Win Percentage | -.002 (.022) | .014 (.018) | .009 (.015) |
| Upset | .008 (.034) | .046 (.029) | .036 (.024) |
| Lag: Upset | .064* (.033) | .036 (.028) | .058** (.025) |
| Lag2: Upset | .069** (.032) | .058** (.028) | .070** (.022) |
| Championship | .069* (.041) | .022 (.035) | .063** (.028) |
| Lag: Championship | .033 (.040) | -.006 (.034) | .051* (.027) |
| Lag2: Championship | .035 (.039) | .002 (.033) | .021 (.026) |
| Endowment | .030 (.045) | -.058 (.038) | -.044 (.030) |
| School fixed effects | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes |
| R-sq | | | |
| Within | .628 | .516 | .262 |
| Between | .011 | .034 | .001 |
| Overall | .061 | .034 | .001 |

Schools=122 Years=13 (standard errors)

*significant at ninety percent level, **significant at ninety five percent level

Table 4: Influence of Football Upsets on Student Quality

| | Mean SAT Scores | Top 10% High School | Top 25% High School |
|----------------------------|--------------------|------------------------|------------------------|
| Football Win Percentage | 46.35 (37.64) | -3.85** (1.50) | -5.42** (2.38) |
| Upset | -34.90 (60.07) | 3.02 (2.39) | 5.33 (3.79) |
| Lag: Upset | -25.81 (56.86) | 1.65 (2.26) | 2.15 (3.59) |
| Lag2: Upset | -46.99 (57.89) | 1.07 (2.30) | 2.23 (3.66) |
| Championship | -57.87 (72.39) | -5.83** (2.88) | -8.39* (4.57) |
| Lag: Championship | -52.36 (70.71) | -7.21** (2.81) | -9.02** (4.46) |
| Lag2: Championship | 11.57 (70.08) | -.95 (2.79) | -.87 (4.42) |
| Endowment | .026 (.079) | .050 (.032) | .001 (.005) |
| School fixed effects | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes |
| R-sq Within | .049 | .063 | .043 |
| Between | .018 | .041 | .007 |
| Overall | .019 | .034 | .004 |

Schools=122 Years=13 (standard error in parentheses)

*significant at ninety percent level, **significant at ninety five percent level