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Abstract:

Successful college football programs draw students to a university. This effect extends to university administrators, who provide higher peer rankings to schools with successful football programs. We analyze the opposite effect, how athletic malfeasance resulting in football postseason bowl bans influences peer rankings and other university measures at the sanctioned school. Surprisingly, we find that the peer ranking increases the year of the football bowl ban but decreases the year after the ban. We further find that bowl bans increase a school's acceptance rate, decrease alumni giving, and decrease academic quality at the sanctioned university.

JEL Codes: Z2, I2
Key Words: Education, (Anti) Flutie-Factor, NCAA, Athletic Malfeasance

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Introduction

University athletic programs are uniquely situated to serve as a signal of university quality to potential students, alumni, and even peer institutions. People outside a university often find it difficult to discern if an institution is being managed or operated efficiently. For this reason, members of the public use different proxies for the perceived quality of a school, and one such proxy is a school's athletic successes or failures. For instance, Mulholland et al. (2014) found a Flutie Effect in the US News and World Report's (USNWR) *America's Best Colleges* rankings. They found that administrators and faculty provide higher peer ratings to schools with a highly ranked football program.

Additionally, Jacob et al. (2018) noted that for every dollar a university spends on academics, the institution spends forty-five to eighty cents on consumption amenities. Their finding suggests that many universities allocate significant monetary resources to dormitories, athletic programs, and student recreational facilities, hoping to attract students with a preference for these amenities. The affiliation between sports and education helps explain why higher learning institutions invest significant monetary resources in athletics as opposed to increasing their spending on academic endeavors.

Prior studies have illustrated how athletic successes can lead to increases in the quality and quantity of applicants in the overall student body. Our research expands on this prior work by detailing the influence of athletic malfeasance on a university as measured by peer rankings, alumni giving, and various student profile measures. For our study, we use data from the USNWR college rankings. Our findings indicate a negative effect on the student profile when a university's athletic program is caught cheating. We further find when gross malfeasance is detected in an athletics program that leads to the imposition of an NCAA football postseason

bowl ban, there are negative impacts on alumni giving, student quality, and acceptance rates. But surprisingly, we find that a school's peer ranking in USNWR improves the year of the bowl ban; however, this is a temporary effect as the improved ranking falls by the same magnitude the following year after the ban.

Related Literature

Multiple studies have investigated the relationship between athletic success and student quality. An early study by McCormick and Tinsley (1987) found a positive relationship between SAT scores and athletic success when examining football performance. Mixon (1995) also found a similar positive relationship between basketball tournament games and student SAT scores. Additionally, Mixon, Treviño, and Minto (2004) noted a positive association between football win percentages and SAT scores.

The relationship between academics and athletics has been tested in many studies, but the correlation between the two has not always proven to be beneficial for a school. While Bremmer and Kesselring (1993) found a positive association between athletic success and SAT scores, the results of this study were not statistically significant. Further, Tucker and Amato (1993) did not find consistent support that basketball success provides a boost to SAT scores (although they do support the idea that football success distributes higher-quality students towards those schools with successful programs). A later study by Tucker and Amato (2006) analyzed a multi-year sample of basketball success, allowing for lags in freshmen SAT scores, and discovered significantly positive results until the second half of the time period studied when the Bowl Championship Series (BCS) football was introduced.

Athletic success also has a disparate impact on the academic distribution of students. Pope and Pope (2009) noted that lower academic achieving students had a greater response to athletic success as measured by SAT scores. In addition, Chung (2013) discovered a positive relationship between athletic success and SAT scores, noting that while all students are affected by athletic success, lower-scoring students seem to be more heavily impacted. Pope and Pope (2014) later expanded this study and discerned that students who were athletes, from out-of-state, Black, or male students were the most likely to be impacted by a winning sports season. They also reasoned that SAT scores increased based on winning seasons, and this effect continued if the team advanced in postseason matches.

Looking more specifically at results from football, Murphy and Trandel (1994) analyzed the relationship between a football team's winning record and the number of applications the institution received. They noted a positive and significant increase in applications sent to a school, albeit this increase was small in magnitude. Smith (2008) found similar results but indicated that merit-based criteria had a larger impact on potential students than athletic-based criteria. McEvoy (2005) also found a positive and significant relationship between sports and applications, with football being the primary driver of increased applications.

Additional research examining the impact of athletics on a university's academic profile indicated that a school is likely to experience changes to the student profile when that institution is featured positively in a news story, had an upset victory, or was implicated in some form of controversy surrounding their championship season (Toma and Cross, 1998). Caudill, Hourican, and Mixon (2018) found that cutting a university's football program contracts the student applicant pool and lowers incoming class quality as measured by ACT test scores. Using "Cinderella" runs in the NCAA Basketball Tournament, Collier et al. (2020) noted that

applications and freshman enrollments increase at schools that make these unexpected runs. Lastly, Eggers et al. (2021) showed that a "Flutie Effect" exists for both the winning team and the losing team in a game identified as a significant upset, with both schools seeing an increase in applications, and the winning school experiencing an increase in enrollment.

The impact of athletic success on a university is not only found in enrollment numbers or incoming student quality but is also present when analyzing current students enrolled at the institution. Both Lindo et al. (2012) and Hernández-Julián and Rotthoff (2014) found that athletic success at a school negatively impacted the overall GPA on campus. In contrast, prior research by Tucker (2004) showed that football success increased graduation rates. Mixon and Trevino (2005) also found a positive relationship between football success and both freshman retention rates and graduation rates. There are studies, however, that have found that basketball success does not impact graduation rates (Tucker), or change the average SAT scores of the incoming class (Tucker and Amato, 2006).

The correlation between athletics and the university has also been examined by looking beyond academic metrics. One of these metrics is the relationship between donor behavior and athletics (Monks, 2003 and Rhoads and Gerking, 2000). Humphreys (2006) also found that state appropriations increase by having a big-time football team, and these results are even larger when fielding a successful big-time football team.

Alter and Reback (2014) discovered that students considering colleges are impacted by both academic and other quality-of-life rankings. Lovaglia and Lucas (2005) noted an association between highly visible athletics programs and increased university prestige in a survey of students at one institution. However, a separate study was inconclusive when examining the association between university rankings and on the field performance (Fisher,

2009). It has also been noted that championships affect academic rankings, but an on-the-field improvement from a sports team does not appear to have an impact on these metrics (Cox and Roden, 2010).

School rankings also drive both enrollments and student quality. Monks and Ehrenberg (1999) indicated that as school ranking fall, there is a decrease in academic quality among the incoming freshman class. Griffith and Rask (2007) have also shown that an increased ranking helps gain high-ability students, with those students who are non-aided being the most responsive. However, moving up in these rankings does not provide equal benefits for all institutions. Bowman and Bastedo (2009) noted that moving up one position into a top 50 ranking and again to a top 25 ranking, is more valuable than merely gaining five places in the 50-75 ranking. Furthermore, one study has shown that ensuring a positive media relationship is also essential to the advertising value of a university (Kim et al., 2007).

Additional literature has focused on whether athletic malfeasance has an impact on the academic profile of a university. The results on this topic are mixed. Hughes and Shank (2008) found that schools struggle to recover from athletic scandals within a short time period. Eggers et al. (2019 and 2020) also showed that postseason bowl bans in football and postseason tournament bans in basketball decreased applications, admittances, and enrollment of freshman students. Conversely, Smith (2015) observed that sanctions such as the loss of scholarships imposed on either a basketball or football program had no impact on the institution in terms of applications. Likewise, Chressanthis and Grimes (1993) also noted a negative enrollment yield correlated with sanctions being applied to a school. Groothuis, Eggers, and Redding (2018) revealed that mean test scores fall when a university's basketball program is placed on probation by the NCAA.

Lastly, the literature examining the role of athletics on peer evaluation scores is relatively new. Volkwein and Sweitzer (2006) established a three-stage relationship in which institutional reputation, coupled with building a foundation for attracting high-quality faculty and students, resulted in productive outcomes for students and faculty. Mulholland, Tomic, and Sholander (2014) analyzed if football performance affected a university's USNWR peer assessment score and found the number of Associated Press (AP) votes a school's athletics program received increased the respective school's peer ranking for all schools in the Football Bowl Subdivision (FBS). They additionally found that being listed in the Coaches' poll for football increased peer rankings; therefore, simply being a member of FBS football appears to positively affect peer assessment scores.

Data and Methodology

To test the impact of athletic malfeasance at a university as measured by NCAA football bowl bans, we use data from 117 Division I football programs for twenty-one seasons from 1998 to 2018.[2] For our study, we utilize data similar to Mulholland, Tomic, and Sholander (2014) from the USNWR, including peer assessment scores. USNWR has been ranking colleges for many years and includes a peer ranking system that was first started in 1998. The USNWR reports data on graduation rates, university acceptance rates, alumni giving, class size, student-faculty ratio, and peer ranking scores.

[2]This sample represents all NCAA Division I FBS (formally D-IA) schools from the American Athletic Conference (AAC, with many of these schools formally in the Big East), 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, and the Western Athletic Conference. Schools from the FCS (Formally D-IAA) and NFS (No Football Schools) are excluded from this sample. Only schools that were in D-IA the entire sample are included (so any school that entered the conference during this time period is not in our sample).

The peer assessment score is the metric that allows us to test whether peers at other institutions penalize schools who undergo potentially adverse events, such as athletic misconduct. The peer assessment portion of the ranking is conducted via a survey and is sent to schools in which the institution shares its ranking category. High-ranking administrators at peer institutions then complete the survey; this includes presidents, provosts, admissions deans, or other individuals in comparable positions within the university (Morse and Brooks, 2020).

The individuals who respond to these surveys are asked to rank their peers based on "undergraduate academic programs on a scale from 1 (marginal) to 5 (distinguished)" (Morse and Brooks, 2020). If the respondent does not feel comfortable rating a school, they are asked to respond with “don't know,” which does not factor into the ratings. These responses are then utilized by USNWR for university rankings that year.

The USNWR indicates the importance of this particular rating by stating, "Academic reputation matters because it factors things that cannot easily be captured elsewhere. For example, an institution known for having innovative approaches to teaching may perform especially well on this indicator, whereas a school struggling to keep its accreditation will likely perform poorly” (Morse and Brooks, 2020). We suggest this measure also provides a test of how athletics may serve as a signal of school quality.

These evaluations are sent in the spring of each year, so Mulholland, Tomic, and Sholander (2014) referenced the most recent sports year that had already occurred for the purposes of their survey. We also relate our measured events to the nearest USNWR survey, and all the schools with identified athletic infractions fall within the National Universities ranking in USNWR. This category is defined by USNWR as those which offer broad undergraduate

programs and graduate programs at both the masters and doctoral level programs with higher levels of research.

The data on football malfeasance comes from the NCAA website. During this period, there were fourteen universities that engaged in malfeasance resulting in a football bowl, including four schools that received two bans each. Postseason bowl bans occur for gross malfeasance, whereas sanctions generally result from violations of the NCAA Division I Manual.

The types of malfeasance that may result in bowl bans or sanctions include, but are not limited to, recruiting violations, improperly paying student-athletes, academic fraud, and loss of institutional control. According to the NCAA rules, violations are handled in a four-stage manner, as outlined by Barnhart (2012). Firstly, the NCAA investigates the infractions that they believe occurred. Secondly, the NCAA charges the athletic program with the violations. Thirdly, the Committee of Infractions (COI) of the NCAA conducts a hearing. Fourth and finally, the COI deliberates and can impose sanctions. In table one, we list all the football postseason bowl bans by year for each school, including the reason for the ban and whether it was self-imposed.

[Table 1]

The variables we use as our dependent variables are reported in table two. In the first three rows, we report various measures of the peer rankings. Initially, we report the mean peer score for a school, which was 3.1, with a minimum of 1.3 and a maximum of 4.9. We further report the change in peer rankings between each year, finding very little difference in scores between years. This indicates that roughly the same number of schools increased as decreased for a mean of 0.01. In absolute value terms, the mean change is still small and equal to 0.061, suggesting that schools' reputations as measured by peer rank only change slightly each year.

[Table 2]

We further use two measures of alumni giving in our analysis. Our first measure indicates the percentage of alumni that donate to their alma mater in a given year. The mean percent giving is 16%, with a maximum of 52% and a minimum of 1.5% of alumni giving each year. Our second measure is the average amount that is given per alumni, with a mean of $98.73. This amount ranges from $1.00 to $273.00. These two measures can be used to test the Sanderson and Siegfried (2018) hypothesis that athletics may influence private donations.

We additionally use multiple measures of student success and academic quality in our analysis. One measure is the acceptance rate at a university, which indicates the selectivity of the school. This measure is calculated by the number of students that are admitted to a school, divided by the number of students that applied to the institution. The mean acceptance rate for schools in our study is 64%, and ranges between 5% and 100%. Another measure is the graduation rate for students within six years of enrollment. The mean graduation rate is 63% and ranges between 21% and 98%. The higher the graduation rate, the more student success at that institution.

The USNWR also reports some aggregate rankings that range between 1 and 300, with 1 being the highest-ranked school and the 300 the lowest-ranked school. For our study, we examine two of these measures. The first ranking we analyze is the graduation and retention rank at a school, which gives us a mean ranking of 82.9. This ranking is calculated by using a moving average of freshman retention and graduation by students within six years. The second ranking we use is the student selectivity rank. This measurement is a combination of the "math and evidence-based reading and writing portions of the SAT and the composite ACT scores," coupled with "high school class standing in the top 10%." In some years prior to 2019, this measurement has also included the acceptance rate of the institution (Morse, Brooks, and Mason,

2018). The average rank for this category is 83.2. In previous research, athletics has been shown to affect student quality and graduation rates; therefore, we use these measures to determine if athletic malfeasance also affects student quality and retention measures.

Lastly, we examine teaching quality at a school as measured by class size and student-faculty ratio. The first measure is large classes, or those classes with greater than 50 students. This category has a mean percentage of 12.62 and ranges from 0 to 36.8. A larger percentage in this category is considered lower teaching quality. Our second measure is small classes with less than 20 students, an average of 41.91 percent that ranges from 15.2 to 97.1 percent. A larger percentage in this category is considered to be a signal of higher teaching quality. Our last measure of teaching quality is the student-faculty ratio, with a mean of 16.75 that ranges from 4 to 32. A lower ratio in this category is considered indicative of higher teaching quality.

Methods and Results

In our empirical model, we include a dummy variable to measure the influence of detected malfeasance and the subsequent postseason ban on our various dependent variables during the year of the ban. One lead measure is estimated to check for an impact before the ban is served, since universities often know about or announce a potential bowl ban before it is implemented. We also include two lag variables after the ban to measure if the detected malfeasance has a lasting effect on the university.

$$Y_{it} = \beta_1 Ban_{t-1} + \beta_2 Ban_t + \beta_3 Ban_{t+1} + \beta_4 Ban_{t+2} + \gamma U + \delta Y + \varepsilon$$

We use a fixed effect regression technique to control for differences between universities and over time. The university fixed effect, *U,* controls for all university characteristics that are time-invariant, including whether the school is religious, private, or public. The year fixed effects, *Y,*

control for changing demographics of students and macro-economic conditions that change over time. We do not include control variables for university quality that change over time because our hypothesis suggests that athletic malfeasances serve as a signal for university quality and therefore are endogenous. There is one specification, however, in which we estimate the change in peer rankings, and in this specification we include university quality measures.

[Table 3]

In table 3, we report the results of athletic malfeasance on changes in the USNWR peer ranking. Column one includes only the bans and their lags, as well as school and year fixed effects. In column two, we add school control variables, which include the percent alumni giving, amount of alumni giving, freshman retention, graduation rate within six years, percent classes greater than 50 students, student-faculty ratio, percent classes less than 20, student selectivity rank, and graduation and retention rank.

Surprisingly, we find that peer rankings increase for sanctioned schools the year of the bowl ban. The year the bowl ban is enacted, the change in peer ranking increased by 0.065, which is an increase of about one standard deviation. When including school controls, this estimate increases to 0.090. However, these positive impacts are short-lived, and the year after the ban, this change decreases by essentially the same magnitude, thereby eliminating the entirety of the gain brought the year of the ban.

In table 4, we report the effects of malfeasance on alumni giving, acceptance rates, and the USNWR student selectivity rank. We find there is no economically significant change in the percent of alumni who donate annually to their university after athletic malfeasance is detected at a school. However, the average amount donated to a university decreases by $11.28 following a bowl ban. Comparing the average giving of $100 a year to our coefficients, we find that

postseason bans lead to an 11% decrease in alumni giving. We also find that universities become less selective during a bowl ban, with acceptance rates of incoming students increasing by 4.2% the year of the ban and 3.1% the year after the ban. The average acceptance rate for the schools in our study is 64%, suggesting these universities are 6.5% and 4.8% less selective on average.

When focusing on rankings, we find the USNWR student selectivity rank gets worse. This ranking increases by five places the year of the bowl ban, indicating a lower number on a scale from 1 being the highest to 300 being the lowest. The result suggests that these schools respond to the bowl ban by being less selective.

[Table 5]

In table 5, we report the influence of postseason bans on student retention rates at a school. We find that a bowl ban has no impact on freshman retention. We do, however, find that there is an effect on the graduation rate for the year of the ban and the next two years after the ban. In the year of the ban, the graduation rate increases by 1.65 percent. The first year after the ban, the graduation rate increases by 1.73 percent, and two years after the ban, the 6-year graduation rate at that school increases by 2.06 percent. Likewise, two years after the ban, we see a significant decrease in the graduation retention rank number, indicating that the school has become a better ranked school. These results suggest in the years surrounding the bowl ban, students are graduating within six years at a three percent higher rate than in other years when evaluated at the mean graduation rate of 63 percent.

[Table 6]

In table 6, we analyze variables that relate to the student-faculty ratios. Typically these measures are used to pick up quality and experience measures in the classroom. Smaller classes allow for more personal attention and a more personal experience in the classroom. However,

this could also happen (unintentionally) when a school does not enroll the targeted number of students in classes. We find there are fewer students per faculty two years after the ban in column one, more small classes the year of the ban (column two), and generally fewer students per faculty member two years after the ban (column three). Thus it appears, when matched with the acceptance rate changes in table 4, that fewer students are enrolling in the banned schools.

Conclusion

Our study demonstrates that an NCAA postseason football bowl ban reduces the academic quality of students opting to attend the sanctioned university, negatively impacts the amount of alumni giving at the school, and increases the acceptance rate at an institution – which together indicate the school is becoming less selective. Given the negative media attention surrounding a postseason ban, these events may serve as a signal to prospective students and alumni regarding the overall quality of the university. These schools then respond by increasing their acceptance rate (becoming less selective) and having classes that are smaller on average, given the lower enrollment. Our results suggest that an Anti-Flutie effect exists for students and alumni following detected athletic malfeasance at a university.

Unexpectedly, however, when schools face athletic malfeasances, their peer rankings improve in USNWR, although only temporarily. This could be a signal to other schools that the sanctioned university administration is willing to penalize bad behaviors (and thus, prioritize good behaviors). Alternatively, this could also indicate that there is no such thing as bad publicity. It is further plausible that schools facing athletic malfeasance penalties choose to devote additional resources to highlight they have changed their behavior. We further find that more students graduate at the sanctioned school, suggesting that a bowl ban has a positive effect

on the school for this measure. This potentially beneficial effect of athletic malfeasance could be due to students paying more attention to academic work than athletic events.

Ultimately, collegiate sports are an exceptionally visible aspect of a university, and athletic misconduct, culminating in highly publicized football bowl bans, can have detrimental ramifications on an institution's overall academic profile. However, the peer rankings of these penalized schools do not have a lasting impact in the eyes of that school's peer administrators.

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Table 1: List of NCAA Football Postseason Bowl Bans

Season Year	University	Year of Ban	Reason for Ban
2002-3	University of Alabama	2002	Recruiting violations and repeat offender status. Ban appealed and upheld by NCAA appeals committee.
2002-3	University of California	2002	Academic fraud, academic eligibility, obligation to withhold ineligible student-athletes from competition, extra benefits, recruiting and lack of institutional control. Ban appealed and upheld by NCAA appeals committee.
2002-3	University of Kentucky	2002	Recruiting violations, academic fraud, lack of institutional control. Ban appealed and upheld by NCAA appeals committee.
2003-4	University of Alabama	2003	Recruiting violations and repeat offender status. Ban appealed and upheld by NCAA appeals committee.
2004-5	Mississippi State University	2004	Recruiting violations and repeat offender status. Ban not appealed.
2010-11	University of Southern California	2010	Improper benefits, lack of institutional control. Ban appealed and upheld by NCAA appeals committee.
2011-12	University of Southern California	2011	Improper benefits, lack of institutional control. Ban appealed and upheld by NCAA appeals committee.
2011-12	University of Miami Florida	2011	Booster violations, lack of institutional control. Self-imposed ban of two years of postseason competition.
2012-13	Pennsylvania State University	2012	Sexual abuse scandal. Four-year ban appealed and overturned by NCAA appeals committee, but only after the second year of the ban had occurred.
2012-13	University of North Carolina	2012	Academic fraud, impermissible agent benefits, participation by ineligible players and failure to monitor the football program. Ban not appealed.
2012-13	The Ohio State University	2012	Non-booster, shop owner providing impermissible extra benefits, loans and discounts in exchange for football awards and equipment. Preferential treatment violations, and unethical conduct. Repeat offender status. Ban not appealed.

2012-13	University of Miami Florida	2012	Booster violations, lack of institutional control. Self-imposed ban of two years of postseason competition.
2013-14	Pennsylvania State University	2013	Sexual abuse scandal. Four-year ban appealed and overturned by NCAA appeals committee, but only after second year of ban had occurred.
2017-18	Ole Miss	2017	Recruiting violations. Self-imposed ban.
2018-19	Ole Miss	2018	Same recruiting violations case. This ban is part of two-year ban imposed by NCAA committee (self-imposed 2017 counted as first year of the ban). Appealed and upheld by NCAA appeals committee.

Table 2: Means

	Mean (Standard Deviation)	Minimum	Maximum
Peer Ranking	3.117 (0.665)	1.3	4.9
Change in Peer Ranking	0.010 (0.126)	-1.1	1.0
Absolute Value Change in Peer Ranking	0.061 (0.110)	0	1.1
Percent Alumni Giving	15.553% (9.030)	1.5%	52.1%
Amount Alumni Giving	$98.731 (64.96)	$1.00	$273.00
Acceptance Rate	63.96% (21.834)	5%	100%
Graduation within 6 years	63.250 (17.138)	21%	98%
Graduation and Retention Rank	82.990 (18.131)	1	300
Student Selectivity Rank	83.193 (62.976)	1	300
Percent Class Size Over 50	12.624 (5.796)	0	36.8
Percent Class Size Under 20	41.913 (12.800)	15.2	97.1
Student Faculty Ratio	16.753 (4.511)	4	32

Schools=117 Years=21 (clustered standard error in parentheses)
Change in Peer rank: Schools=117 Years=19 (clustered standard error in parentheses)

Table 3: Peer Effects

Variable	Change in Peer Rank	Change in Peer Rank
Lead: Bowl Ban	-0.011 (0.018)	-0.021 (0.017)
Bowl Ban	0.065* (0.038)	0.090* (0.017)
Lag: Bowl Ban	-0.070* (0.042)	-0.76* (0.043)
Lag2 Bowl Ban	0.014 (0.023)	0.016 (0.025)
Constant	0.028** (0.006)	0.003 (0.127)
School fixed Effects	Yes	Yes
Year fixed Effects	Yes	Yes
School Control Variables	No	Yes
R-sq Within Between Overall	 0.075 0.093 0.071	 0.102 0.006 0.078

Change in Peer rank: Schools=117 Years=20 (clustered standard error in parentheses)
*significant at the 90% level. **significant at the 95% level.

Table 4: University Effects

Variable	Percent Alumni Giving	Amount Alumni Giving	Acceptance Rate	Student Selectivity Rank
Lead: Bowl Ban	1.071 (0.893)	-11.284** (3.535)	4.217** (1.623	4.957** (2.10)
Bowl Ban	-0.139 (1.524)	-7.378 (5.043)	3.098** (1.353)	3.591 (2.340)
Lag: Bowl Ban	-0.403 (1.706)	-1.160 (6.759)	3.449** (1.190)	0.629 (1.420)
Lag2 Bowl Ban	-0.035 (0.474)	-1.770 (3.259)	4.471* (2.821)	4.761 (4.823)
Constant	17.761** (0.752)	107.342** (4.339)	71.558** (1.491)	104.108** (2.531)
School fixed Effects	Yes	Yes	Yes	Yes
Year fixed Effects	Yes	Yes	Yes	Yes
R-sq Within Between Overall	 0.159 0.012 0.023	 0.030 0.052 0.001	 0.251 0.000 0.020	 0.022 0.046 0.000

Schools=117 Years=21 (clustered standard error in parentheses)
*significant at the 90% level. **significant at the 95% level.

Table 5: Student Retention Effects

Variable	Freshman Retention	Graduation within 6 Years	Graduation Retention Rank
Lead: Bowl Ban	-0.033 (0.719)	0.624 (0.912)	1.441 (3.096)
Bowl Ban	-0.189 (0.380)	1.647** (0.635)	-2.077 (1.941)
Lag: Bowl Ban	0.273 (0.358)	1.730** (0.857)	-5.450** (2.368)
Lag2 Bowl Ban	0.081 (0.436)	2.057** (3.259)	-6.688** (2.821)
Constant	81.409** (0.253)	59.102** (0.797)	107.995** (2.137)
School fixed Effects	Yes	Yes	Yes
Year fixed Effects	Yes	Yes	Yes
R-sq Within Between Overall	 0.299 0.038 0.021	 0.052 0.002 0.025	 0.041 0.006 0.002

Schools=117 Years=21 (clustered standard error in parentheses)
*significant at the 90% level. **significant at the 95% level.

Table 6: Faculty-Student Measures

Variable	Percent of classes over 50 students	Percent of classes under 20 students	Student Faculty Ratio
Lead: Bowl Ban	-0.531 (0.464)	0.333 (0.864)	0.048 (0.564)
Bowl Ban	-1.424** (0.668)	2.142* (1.239)	-0.027 (0.400)
Lag: Bowl Ban	-1.310** (0.415)	0.851 (1.319)	-0.403 (0.296)
Lag2 Bowl Ban	-1.587* (0.867)	1.023 (1.711)	-0.710* (0.360)
Constant	12.794** (0.540)	40.664** (0.840)	17.479** (0.338)
School fixed Effects	Yes	Yes	Yes
Year fixed Effects	Yes	Yes	Yes
R-sq			
Within	0.093	0.031	0.066
Between	0.078	0.001	0.150
Overall	0.004	0.002	0.003

Schools=117 Years=21 (clustered standard error in parentheses)
*significant at the 90% level. **significant at the 95% level.