Agency Behavior in a Nonprofit Setting: Effects of the 1984 Supreme Court NCAA Decision

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Kathleen A. Carroll*
UMBC Department of Economics
1000 Hilltop Circle
Baltimore, MD 21250

Brad R. Humphreys
UMBC Department of Economics
1000 Hilltop Circle
Baltimore, MD 21250

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Abstract

The NCAA is commonly viewed as a cartel. We model the cartel relationship between the member teams and the NCAA central organization as a principal-agent relationship. Our model predicts imperfect agency behavior on the part of the NCAA with corresponding overregulation relative to the level preferred by the member teams. We empirically test the model by examining the impact of the 1984 Supreme Court decision that reassigned the telecast rights for intercollegiate football from the NCAA to the individual member teams. Our empirical estimates of telecasts, attendance, and competitive balance support the prediction of imperfect agency behavior by the NCAA.

Keywords: NCAA, Intercollegiate Football, Broadcast Regulation, Antitrust Policy

JEL codes: L31 Nonprofit Institutions, L44 Antitrust Policy and Nonprofit Institutions, L82 Broadcasting, L83 Sports.

1 Introduction

The NCAA is most commonly viewed as a cartel [see, for example, Koch (1983; 1986); Pacey (1985); Lawrence (1987); Fleisher et al (1992); and Mackey (1995).] The cartel view of the NCAA posits a group of individual competitors held together through rules and regulations administered by the NCAA central organization as a facilitating device for cartel behavior. One implicit assumption is that in the absence of the NCAA structure the intercollegiate athletic industry would operate more competitively and efficiently, producing a greater level of output (games) at a lower price in each sport.[1] The cartel model, by proposing a unified group in which the NCAA central organization acts as a facilitator of member school interests, also implicitly assumes perfect agency behavior on the part of the NCAA central organization.

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[1]We understand that the inherent nature of an athletic event as a joint product of competitors requires some minimal structure to ensure a viable product, such as ensuring availability of competitors for any one team. By "NCAA structure" here we mean rules and regulations beyond this minimally required level.

Some alternative views of the NCAA can be found in the literature. Zimbalist (1999) points out that although the NCAA operates like a cartel in some respects, this view cannot fully explain all aspects of the behavior of the NCAA. Koch (1983, 1986) proposed that the NCAA operates as a separate central organization that has different interests than do the member universities. He stated that the primary concern of the NCAA central organization is its own power, size and permanence (1986, p. 331). In this paper we explore the implications of the views of Zimbalist and Koch. If the NCAA central organization has objectives of its own that differ from those of the university members, does the pursuance of these alternative objectives affect NCAA policies and regulations? If such behavior exists, does it mitigate or exacerbate any cartel effects?

The suit brought against the NCAA by two members of the cartel, the Universities of Oklahoma and Georgia, contested the NCAA's regulations of college football telecasts. This legal action by cartel member teams suggests imperfect agency behavior by the NCAA. In this paper we examine this issue in view of the 1984 Supreme Court decision in this suit that disallowed the NCAA control over the negotiating rights to televising college football games.[2] The NCAA's primary line of defense to this suit was that the telecast regulations were necessary to protect live game attendance and to maintain competitive balance across teams so as to ensure fan interest, both considered important to member team interests. The literature evaluating the impact of this decision contains conflicting evidence on the nature of the relationships between football telecasts and attendance, and telecasts and competitive balance among teams.

We explore these issues by modeling the relationship between member colleges and the NCAA central organization as a principal-agent relationship. This approach is complementary to the cartel view of the NCAA. The NCAA may be viewed as a regulatory organization with respect to intercollegiate sports and operates essentially as a monopoly in this role.[3] Although it is a regulator, NCAA regulations ostensibly promote the interests of the member teams. We model the individual member teams as principals: The member teams authorize the NCAA central organization as their agent to develop and enforce regulations that will make them better off than if they acted independently. As in any principal-agent relationship, each party has its own objective(s). The degree to which the objectives of the principal are achieved depends on the degree to which the agent's objectives diverge from those of the principal.

The 1984 Supreme Court decision presents a unique opportunity to examine the agency behavior of the NCAA's central organization. This decision effectively altered the rights structure in negotiating football television contracts by reducing those rights for the NCAA central organization and increasing the rights of the member colleges. If the NCAA had acted as a perfect agent then its regulation of football telecasts and contracts would have maximized the objectives of the member team-principals. If, on the other hand, the NCAA had acted as an imperfect agent, then its regulations would have promoted its own objectives rather than those of the member teams, and the teams would be better off as a result of the Supreme Court decision.

Our findings indicate that although the Supreme Court decision increased the total number of televised football games, it had essentially no impact on either live game attendance or competitive balance. The estimated impact of the decision on attendance is negative but not statistically significant over all Division I teams as well as for "power" teams and "non-power" teams examined separately. We define "power teams" as those that appeared on national television four or more times from 1978-1983. The "power teams' in the sample are listed on Table 1. The estimated impact of the decision on competitive balance is mixed, although overall there was essentially no

[2] *National Collegiate Athletic Association v. U.S. v. Board of Regents* 468 US 85, 120 (1984).

[3] The National Association of Intercollegiate Athletics (NAIA) performs functions similar to those of the NCAA. However, the NAIA primarily deals with small schools which are not involved in major intercollegiate athletic events such as those in NCAA affiliated schools.

Table 1: "Power" Schools

Alabama	Michigan	San Diego St.
Arkansas	Navy	Southern California
Army	Nebraska	Stanford
Florida	Notre Dame	Texas
Florida St.	Ohio St.	Texas A&M
Georgia	Oklahoma	Tulane
Georgia Tech	Penn St.	UCLA
Miami	Pittsburgh	Washington

significant change following the decision. We employed various measures of competitive balance, and applied these both within conferences and across all Division I teams. An additional finding is that the characteristics of the teams more likely to appear on TV following the Supreme Court decision differed from those characteristics that applied under the NCAA regulatory regime. Our findings on team characteristics as well as on attendance and overall competitive balance support the prediction of imperfect agency behavior by the NCAA.

2 A principal-agent model of the NCAA

A representative member college principal

A member institution obtains benefits from the way in which a quantity x of NCAA regulation improves its revenues (TR) and reputation (REP). A member college also incurs costs associated with NCAA regulations. These costs are the opportunity cost, c, associated with the payment to the NCAA, which is the member college's share of revenues contributed to the NCAA, $s(TR)$, and the constraints that each institution faces as a result of the regulations.

Let the benefits, b, to a member college principal from any level x of the relevant NCAA regulation be defined so that $TR(x) = b_1(x)$ and $REP(x) = b_2(x)$. Similarly, the opportunity cost to the member college principal of any level of the relevant NCAA regulation be defined as $c(x)$. The member college principal's utility function associated with an NCAA regulation may therefore be stated as

$$U_P = TR(x) + REP(x) - c(x) - s[TR(x)],$$

so that

$$U_P = b_1(x) + b_2(x) - c(x) - s[b_1(x)]. \tag{1}$$

The NCAA central organization agent

Our behavioral model of the NCAA central organization proposes that it obtains benefits from two sources: income or revenues of the organization and the prestige and authority of the NCAA in the field of intercollegiate athletics. [4] Higher income to the NCAA central organization provides greater

[4]We understand that, as with any organization, the NCAA central organization is a collection of individuals whose role is to design, implement, and enforce the regulations as put forth by the organization as a whole. The behavior which we attribute here to the central organization reflects the likely administrative behavior of the individual(s) who

discretionary ability for NCAA managers, particularly given that its nonprofit status precludes monitoring of managers in the form and to the degree that would occur through the evaluation of profitability in capital markets. Because profit is not explicitly measured or accounted for, costs and expenditures may increase with managerial discretion as revenues increase. The NCAA's role as regulator and monitor of intercollegiate programs is important to the coordination and effective operation of the athletic programs. The NCAA central organization is dependent upon these programs for its own revenues. We incorporate this into our behavioral model as the NCAA's share of revenue, s, it receives from any member school, $s(TR)$.

Prestige and authority reflect the NCAA central organization's power and ability to exert control over the individual athletic programs. As stated earlier, the NCAA's regulation of these programs is important to their effective operation. The NCAA as producer of these regulations also places the organization's management in a clear position of authority and generates a high profile and significant prestige in the sports community and beyond. Our model incorporates the relationship of NCAA's prestige and authority to the NCAA's role as regulator through the inclusion of the variable ($AUTH$).

The NCAA's decision on the form and implementation of any particular regulation x is made with these potential benefits in mind. Therefore, from the NCAA's decision vantage point, income and authority each depend on x.

Let the benefits, b, to the NCAA from any level x of the relevant NCAA regulation be defined so that $s[TR(x)] = s[b_1(x)]$ and $AUTH(x) = b_3(x)$. The NCAA agent's utility function associated with an NCAA regulation may therefore be stated as

$$U_A = s[TR(x)] + AUTH(x),$$

so that

$$U_A = s[b_1(x)] + b_3(x). \tag{2}$$

Welfare maximization with perfect and imperfect agency behavior

Maximizing social welfare in this framework maximizes the joint welfare of the principal and agent. We show first the outcome with perfect agent behavior as a benchmark for efficiency in the level of regulations.

Perfect agent behavior

With perfect agency, $b_3(x) = 0$, so that the agent seeks to maximize the utility of the principal plus its own income. The relevant social utility function is therefore

$$U_A = U_P + s[TR(x)] = U_P + s[b_1(x)]. \tag{3}$$

The optimization problem may be stated as

$$max\ U_P + s[b_1(x)],$$

or

$$max\ b_1(x) + b_2(x) - c(x) - s[b_1(x)] + s[b_1(x)].$$

are in authority at the NCAA and who are responsible for the decision to go forward with any particular regulatory design or implementation and enforcement procedure.

Let $b_1(x) + b_2(x) = B(x)$. The revenue payment from the school to the agent nets out, so that the optimization problem with perfect agency behavior becomes

$$max\ [b_1(x) + b_2(x) - c(x)] = max\ [B(x) - c(x)]. \tag{4}$$

The first order condition for a maximum is

$$b_1'(x) + b_2'(x) - c'(x) = 0,$$

which may be stated as

$$b_1'(x) + b_2'(x) = c'(x),$$

or

$$B'(x) = c'(x). \tag{5}$$

The optimal level of regulation, $x*$, is shown in Figure 1.

Imperfect agent behavior

With imperfect agency, the agent seeks to maximize its own utility, which, while related to as the objective of the principal (through the revenue effect) is distinct from the utility of the principal. The relevant social utility function therefore becomes the combined utility functions of the member principal and the NCAA agent:

$$U_P + U_A = b_1(x) + b_2(x) - c(x) - s[b_1(x)] + b_3(x) + s[b_1(x)]. \tag{6}$$

The imperfect agency optimization problem may be stated as

$$max\ b_1(x) + b_2(x) - c(x) - s[b_1(x)] + b_3(x) + s[b_1(x)],$$

or

$$max\ B(x) - c(x) - s[b_1(x)] + b_3(x) + s[b_1(x)], \tag{7}$$

where $B(x) = b_1(x) + b_2(x)$ as before. The revenue payment from the school to the agent again nets out, so that the optimization problem with perfect agency behavior becomes

$$max\ [B(x) + b_3(x) - c(x)].$$

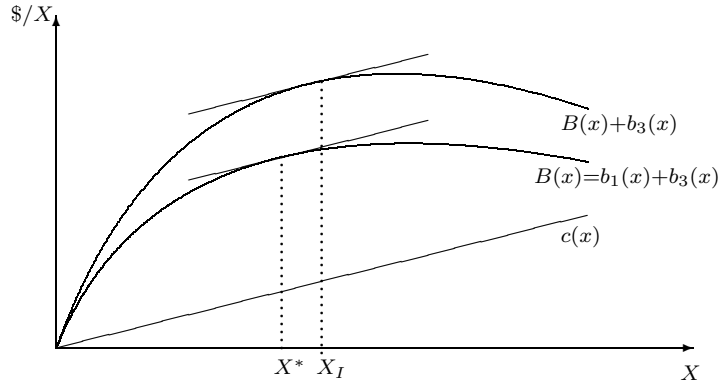
The first order condition for a maximum is

$$B'(x) + b_3'(x) = c'(x). \tag{8}$$

The level of regulation with imperfect NCAA agency behavior is shown in Figure 1 as $x_I > x*$.

The effect of imperfect NCAA behavior is that the level of regulation designed and implemented by the NCAA is greater that which is optimal for the member college principals even given the requisite sharing of revenue with the NCAA. The implication of this in a cartel setting is that, to the extent that NCAA regulations adversely affect choices by individual member principals, these choices are more highly constrained than is optimal. The NCAA regulations on televising intercollegiate football constrained the number of appearances in total and of any given member school (the number of telecast games available to fans, or consumers of intercollegiate football) which can affect member team revenues and reputation from increased visibility on television. This

Figure 1: Imperfect Agency Behavior



alters the cartel outcome as well. If a member college participates in the NCAA to obtain a share of cartel benefits, imperfect NCAA agency behavior has the effect of reducing those benefits below the expected cartel outcome by restricting total output of telecasts and telecasts of games for any particular member team further than would be predicted in a cartel with perfect agency behavior. The telecast regulations reduce surplus benefits and redistribute these benefits from member teams to the NCAA central organization decision makers.

In their analysis of the 1984 Supreme Court decision, Pacey (1985) and Greenspan (1988) find that the response of the colleges to this decision resulted in a larger number of televised games and increased benefits to consumers of football games. Other effects are less clear. They suggest that this response to the decision resulted in decreased football related revenues to many NCAA member teams, advertisers, television networks and syndicators, and redistributed resources among the NCAA member teams. Pacey's analysis relies on legal briefs rather than specific data. Greenspan's conclusions are based on highly aggregated data, such as annual total football revenue and attendance.

Predicted effects of NCAA imperfect agency behavior on live game attendance and benefits in terms of recruiting and other factors that may affect reputation are also unclear. If televised games are a substitute for live game attendance, as Lawrence (1987) and Fizel and Bennett (1989) suggest, then the 1984 decision could result in lower live game attendance as the number of televised games increases. Such an outcome would be evidence suggested that the NCAA telecast regulations reflected perfect agency behavior by promoting interests of the member team principals through promoting increased attendance. If, however, televised games and live game attendance are complementary, as the Kaempfer and Pacey (1986) study suggests, then the 1984 decision would promote live game attendance. This outcome, or an outcome where attendance is unaffected by the decision indicating no relationship between telecasts and attendance, would provide support for the hypothesis that the NCAA's television regulations reflected imperfect agency behavior by not promoting the interests of the member principals.

The other primary line of defense by the NCAA was equalization of competition among member teams. The motivation for this is that equalization of competition would result in more interesting athletic events, thus stimulating fan interest and making the member teams better off. There is some controversy with respect to the effect of the 1984 decision on competitive balance. Koch (1986) stated that the decision "accentuated the existing inequality among the various" colleges (p. 329). Greenspan (1988), however, stated that the increase in the number of televised games for a

larger number of teams following the removal of NCAA constraints could have an equalizing effect on the relative competitiveness of teams. This would occur because increased television exposure for more teams would generate a corresponding increased interest of potential recruits so that better players may be more evenly spread across all member colleges. If Koch's view is correct, then the NCAA telecast regulations would have reflected perfect agency behavior by promoting the interest of the member team principals. Competitive balance would be reduced following the 1984 decision. If Greenspan's view is correct, then the effect of the NCAA telecast regulations would have reflected imperfect agency behavior by the NCAA, and competitive balance would be improved following the 1984 decision.

3 Empirical Analysis

Data

Our data come from the college football seasons from 1977 through 1991. We focus only on Division I-A football, the NCAA classification composed of the largest intercollegiate football programs in the country. The full sample consists of 137 institutions that played Division I college football in 1978. The full sample contains some teams, like the Ivy League schools, that are now in Division I-AA but were Division I before this division was split into I-A and I-AA in 1980.

The vast majority of televised college football games were played between Division I schools during this period. The sample period includes seven seasons before the 1984 Supreme Court decision and seven years following the decision. We use this period because it contains an equal number of seasons before and after the decision and also includes a period of relatively stable conference composition in Division I. There were a number of important changes to the conference structure in Division I in the period following the 1991 season, including the establishment of two new major football conferences, the Big East and the Big XII, expansions of the Southeast and Big 10 conferences, and the demise of the Southwest Conference. We end the sample in 1991 to avoid confusing the effects of the Supreme Court decision with the effects of these changes in conference alignment within Division I. There were 8467 games played between Division 1 teams during this period; 4094 were played from 1977 to 1983 and 3840 were played from 1985 to 1991.

The primary source of data on individual college football games is the comprehensive web site developed by James Howell for the Usenet newsgroup *rec.sport.football.college*.[5] This web site contains an archive of the participating teams, date, location and final score of nearly every major college football game ever played from the late 19th century on. Data on television broadcasts of college football games were taken from various issues of the Report of the NCAA Football Telecast Committee for the period 1978-1983 and from individual issues of USAToday for the period 1984-1991.

The data on individual games were supplemented with season-specific data on conference affiliation, total home attendance, number of home games, coaching changes, conference standings, post-season bowl appearances and final rankings in Polls. These data were primarily taken from various issues of NCAA Football, an annual publication of the National Collegiate Athletic Association. Final Poll rankings were obtained from various issues of the New York Times and USAToday.

Finally, institution-specific enrollment data were obtained from the Integrated Postsecondary Educational Data (IPEDS) system, collected and published by the U.S. Department of Education's National Center on Educational Statistics. The IPEDS Fall Enrollment survey contains detailed information on enrollment at all U.S. institutions of higher education as of October of each academic

[5] http://www.cae.wisc.edu/ dwilson//rsfc/history/howell/

year, the approximate midpoint of the college football season.

Telecasts

The 1984 Supreme Court decision radically changed the property rights to college football telecasts. In the period 1977-1983, the NCAA determined how many football games would be broadcast, which games were broadcast and which networks would be permitted to broadcast college football games. In the post-decision period, schools and conferences were free to negotiate with networks, and any network could televise college football games. Given the striking differences between the pre- and post-decision environment, we first examined some basic sample statistics from our data to illustrate how college football telecasts were affected by the decision.

We restrict our analysis to regular season television appearances on national television networks or national cable stations like ESPN and TBS. Before 1984 there were a number of additional types of over the air broadcasts and closed circuit telecasts of college football games limited to local markets, but these appearances did not produce any appreciable revenues or exposure beyond local areas. Broadcasts on networks or cable stations can be divided into two types: regional broadcasts and national broadcasts. National broadcasts were carried by all local network affiliates in the country. Regional broadcasts were carried by some subset of the local network affiliates. All football games on cable stations are defined as national broadcasts.

Figure 2 shows the number of television appearances by schools in our sample over the period 1978-1990. During the period of NCAA control of football broadcasts there were more regional broadcasts than national broadcasts but during the post-1984 period the number of national broadcasts increased relative to the number of regional broadcasts. The NCAA generally negotiated two-year contracts with broadcasters. The contract periods in the sample were 1978-1979, 1980-1981 and 1982-1983. From this figure, the NCAA was increasing the number of telecasts even before the 1984 decision, perhaps in response to the Board of Regents case which was filed on September 8, 1981. However, the almost threefold increase in the total number of telecasts after deregulation is striking. This increase in the number of telecasts has been interpreted as a direct result of the loss of cartel power by the NCAA following the 1984 Supreme Court decision.

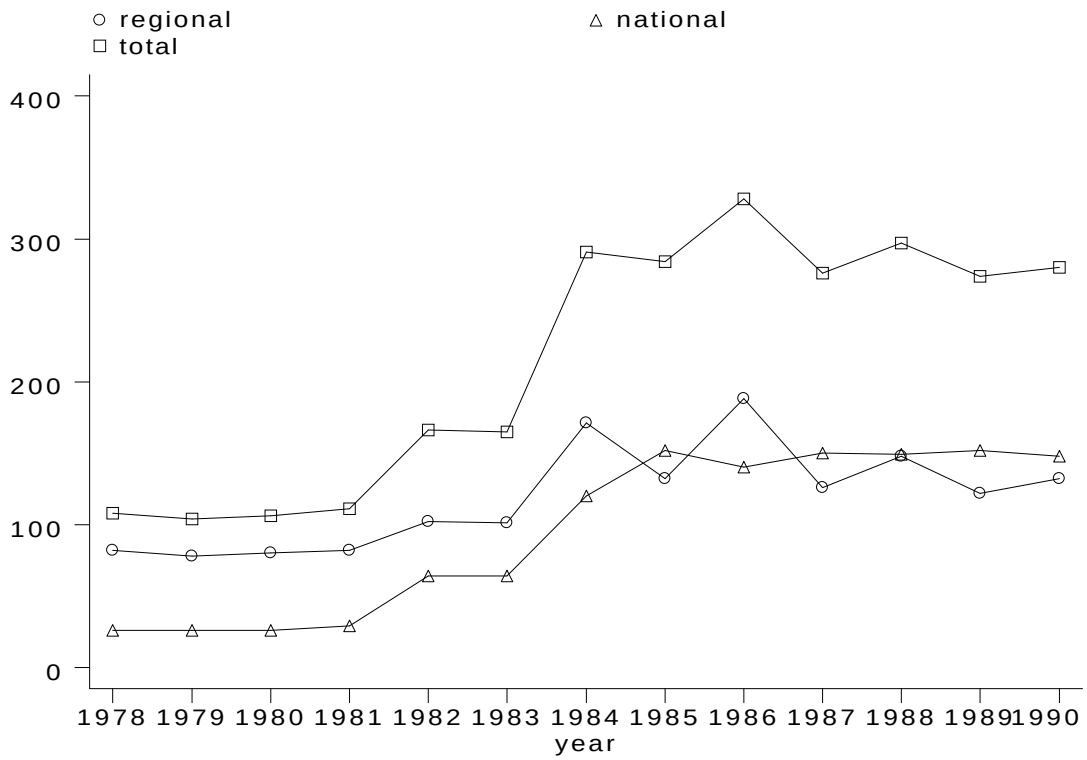
There are two ways to look at the distribution of football telecasts in the sample: by team-seasons and by teams. Table 2 shows the distribution of telecasts by team-season in the sample. There are 137 teams and 13 seasons in the sample, giving a total of 1,781 team-seasons in the sample. Note that the columns of Table 2 sum to 100%.

Table 2: Distribution of TV Appearances by Team-Season, 1978-1990

# of Appearances per season	National TV	Regional TV	Total
0	67%	54%	43%
1	17%	23%	20%
2	8%	13%	13%
3	4%	5%	8%
4	2%	4%	6%
5	2%	1%	4%
6+	1%	0%	6%

From Table 2, most teams in the sample had no TV appearances in an average season. National broadcasts were also relatively rarer than regional broadcasts. It also appears that the majority

Figure 2: TV Appearances By Year



of TV appearances in the sample were concentrated among a relatively small number of teams, as only 36% of the teams in the sample had multiple TV appearances in a season. However, just because the average team did not make a TV appearance in an average season in the sample does not mean that most teams did not appear on TV during the sample period. Table 3 shows the distribution of total TV appearances for the 137 schools in the sample over the entire sample period and in the six years before and after the Supreme Court decision.

Table 3 shows the distribution of TV apeparances for all schools in the sample over the entire 1978-1990 period. Table 3 indicates that each team in the sample appeared on TV at least once during the period 1978-1990. However, about one third of the schools appeared on TV five times or fewer over this period, and between 10 and 15 percent only appeared once. At the other end of the distribution, nearly half the s in the sample appeared 16 times or more, or more than once per year on average. The pre- and post-1984 breakdown indicated that the majority of these appearances came after 1984.

Table 3: Distribution of Total TV Appearances By School, 1978-1990

	% of Teams in Sample		
Total TV Appearances	1978-1990	1978-1983	1985-1990
0	0%	11%	11%
1	10%	15%	13%
2-5	23%	30%	20%
6-10	10%	18%	11%
11-15	9%	16%	8%
16+	48%	3%	37%

Based on the distribution of telecasts shown on the tables above, the increase in the number of telecasts after 1984 does not tell the entire story. Deregulation of college football telecasts also changed the characteristics of the games that were televised. In order to further explore the impact of deregulation on TV appearances, we analyzed the factors that explain which games appeared on television before and after deregulation. To do this, we created a binary variable, $TVA_{i,t}$, which takes the value of 1 if school i appeared on television in year t. We then estimated the parameters of the following Logit model

$$TVA_{i,t} = \gamma_i + \alpha_1 W_{i,t-1} + \alpha_2 RANK20_{i,t-1} + \alpha_3 TV_{i,t-1} + \alpha_4 BOWL_{i,t-1} + \alpha_5 ENR_{i,t} + \alpha_6 EXP_{i,t-1} + e_{i,t} \quad (9)$$

using the sample data described above. W is the number of wins by team i in the previous season, $RANK20$ is an indicator variable that is equal to 1 if team i was ranked in the UPI or AP Top 20 in the previous season, TV is an indicator variable that is equal to 1 if team i appeared on TV in the previous season, ENR is total headcount enrollment in thousands at school i, $BOWL$ is an indicator variable that is equal to 1 if team i played in a bowl game in the previous season, EXP is the number of years of head coaching experience of the football coach at school i, and e is an error term that is assumed to be normally distributed with zero mean and constant variance. Notice that this specification includes a school-specific effect on the probability of appearing on TV, g_i. This school-specific effect captures unmeasured factors like reputation and prestige on the probability of a school's football team appearing on television.

Table 4 shows the results of estimating Equation 9 for several different subsamples and types of telecasts. The estimated school-specific effects are not reported but are available from the

authors on request. These results show a clear difference in the characteristics of games that were televised before and after 1984. Before 1984, television appearances in the previous season and bowl appearances in the previous season were the most important factors affecting a television appearance in the current season. Success in the previous season, as measured by the number of regular season wins, had no effect on television appearances in the current period. Appearing on television in the previous season reduced the probability of appearing on television in the following year, holding the school-specific effect constant. This reflects the NCAA policy of distributing television appearances widely across teams. Note that the results on Table 4 are robust to the exclusion of the lagged dependent variable.

Table 4: Fixed-Effects Logit Regressions

	Total Appearances		National Broadcasts		Regional Broadcasts	
	Pre '84	Post '84	Pre '84	Post '84	Pre '84	Post '84
Wins Last Season	-.015	.141*	.096	.183*	-.018	.058
	(.069)	(.071)	(.091)	(.068)	(.069)	(.066)
Top 20 Ranking Last Season	-.151	-.802	-.173	.584	-.302	-.684
	(.567)	(.656)	(.505)	(.456)	(.535)	(.458)
TV Appearance Last Season	-.800*	-.518*	-.218	-.120	-.810*	-.680*
	(.235)	(.261)	(.314)	(.280)	(.254)	(.289)
Bowl Last Season	1.36*	.004	.472	.115	1.44*	.339
	(.445)	(.454)	(.446)	(.372)	(.427)	(.419)
Enrollment (000s)	.002	-.126	.307*	.121	.035	-.063
	(.129)	(.107)	(.159)	(.105)	(.123)	(.092)
Head Coachs Experience	.023	.015	.090*	.001	.025	.007
	(.032)	(.030)	(.050)	(.095)	(.028)	(.025)
N (Teams)	448(90)	387(65)	335(67)	471(79)	483(97)	455(76)

Standard Errors in Parentheses
*: Significant at 10% level

In the later period the primary determinant of a television appearance is success in the previous year. Prior television appearances still reduce the probability of appearing on television in the current season, but the marginal effect fell from -6% to -3.8%. The difference may be due to network's preferences for games between successful teams in order to maximize the size of the viewing audience.

There is also a difference in the determinants of regional telecasts and national telecasts. In the pre-1984 period, national telecasts tended to involve colleges that are large in terms of enrollment, and teams led by experienced coaches, a proxy for the reputation and stability of the football program. The NCAA appears to have rewarded large and stable football programs with national television appearances. In the later period, size and the experience of the head coach do not predict national television appearances; only success in the previous season is a good predictor of television appearances in the current season. For regional broadcasts, there is little difference in the two periods, perhaps because many of the post-1984 regional broadcasts are syndicated broadcasts of conference games that are not part of major network programming. The Atlantic Coast Conference may be able to force a syndicated carrier to televise games between some of the weaker teams in the league and a nationally recognized team like Florida State as part of the season package of games.

These estimated effects support the hypothesis of imperfect agency behavior on the part of the NCAA. First, evidence shows that the total number of games telecast nationally increased following the Supreme Court decision. This evidence is consistent with our model's prediction of a higher level of regulation than is in the interest of member team principals. This would have the effect of

restricting output below the level that maximizes net benefits to the principals.

Second, the difference in characteristics of the teams most likely to appear on television before and after the decision provide additional evidence of NCAA imperfect agency behavior. During the period of NCAA regulation, the teams most likely to be included in the NCAA package offered to the networks were those at larger schools and whose head coach had greater experience in that position. Such teams were more likely to be well known and command higher TV audiences and higher value as part of the package. In addition, teams which had appeared in previous seasons were less likely to be included in the NCAA package. This created scarcity and increased the value of these individual teams. Preceding season success had no statistical effect on the NCAA's choice in the period of regulation prior to the Supreme Court decision.

Together, the significant determinants suggest that the NCAA's packaging strategy was one that maximized revenue from the package. Because the price paid to each team for a telecast was the same for each school, regardless of size, maximizing total package revenue maximizes revenue for the NCAA, not for the individual teams. This outcome promotes NCAA central organization interests by directly increasing revenues available to its management and also by expanding its role of authority over member teams.

In contrast, following the 1984 decision, the primary indicator of individual team appearances in any season was its (successful) record in the preceding season. This indicator would promote audience size and TV ratings, increasing market value to the broadcaster for the individual team. The post-decision characteristic of teams likely to be telecast thus indicates revenue maximization for individual teams rather than for the NCAA. These differences in characteristics of telecast teams before and after the decision suggest that NCAA's regulations were designed to promote its own interests at the expense of the interests of the member team principals.

Competitive Balance

Did the 1984 Supreme Court decision affect competitive balance in college football? The issue is important because competitive balance affects fan interest and thus demand for tickets and telecasts which in turn affects revenue earned by the schools and the NCAA. Although this question has been addressed by several previous studies, no clear consensus on the direction or significance of this effect has emerged in the literature. The disagreements in the literature focus on three distinct areas:

1. the direction of the impact of telecast deregulation on competitive balance;
2. the appropriate measure of competitive balance; and
3. the particular games that might have been affected by deregulation.

We address each area in turn.

Direction of the impact of telecast deregulation on competitive balance

The direction of the impact of telecast deregulation on competitive balance depends in part on the level of competitive balance during the period of NCAA regulation of football telecasts before the 1984 decision. NCAA had argued that one purpose of the regulations was to promote equalization of competition across teams. Koch's (1986) view would support this position and would predict that the period of NCAA regulation should be one of relatively greater competitive balance than would exist with deregulation following the decision.

The other view, as presented by Pacey (1985) and Greenspan (1988), believes that the NCAA's regulation of college football telecasts reduced competitive balance. The Supreme Court decision suggests that a majority of the Court held this position. Our behavioral model supports this view. Imperfect agency behavior would generate regulations to promote the NCAA's own interests rather than the interests of the member team principals. In this situation our model predicts either reduced competitive balance or no improvement in competitive balance in the period following the decision.

Measuring competitive balance

The second disputed issue centers on the appropriate measure of competitive balance. Winning percentage, defined as the number of wins divided by the total number of games played by a team over some period of time, is the most common indicator of competitive balance in sports. One common measure of competitive balance, developed by Noll (1988) and Scully (1989) is the variability of the distribution of the winning percentages of some group of sports teams over some period of time. Other commonly used measures of competitive balance include average winning percentages, Gini coefficients calculated from winning percentages, and excess tail frequencies of the winning percentage distribution. See Fort and Quirk (1995) and Schmidt and Berri (2001) for a full discussion.

Bennett and Fizel (1995), Eckard (1998) and Humphreys (2002) have all pointed out a potential problem with many commonly used measures of competitive balance: they do not reflect year-to-year changes in relative standings of teams. Both Bennett and Fizel (1995) and Eckard (1998) use only conference winning percentages to measure competitive balance. Bennett and Fizel use the ratio of the actual standard deviation of winning percentage to the idealized standard deviation for each conference, as well as summary statistics for the top and bottom two teams in each conference in each year to capture the effects of turnover in relative standings. They conclude that there was in increase in competitive balance in conferences after 1984. Eckard proposed decomposing the variance of conference winning percentages into a time and cumulative component. He also calculated Hirfindahl-Hirschman Indexes (HHIs) of bowl game appearances, top 20 poll finishes, and conference championships. Eckard also concluded that competitive balance increased after 1984 within Division I-A conferences.

Within-conference and division-wide competitive balance

The third contested issue centers on the possibility of a differential impact of telecast deregulation on games played within a conferences and those played outside conferences. Colleges belonging to a football conference must play a predetermined number of games against other conference members in an alternating, or "home-and-home," arrangement each year. These conference games typically make up a majority of the 11 football games that NCAA regulations allow each team to play in a season and the team's records in these games determine the conference champion. Teams also play a smaller number of non-conference games each year. These games are arranged by contracts between individual teams and may be scheduled years in advance. In general, the opponents and location of conference games are outside the control of an individual institution while the opponents and location of non-conference games are under the control of the institutions.

Carroll (1991) found evidence that competitive balance increased after telecast deregulation in that the overall winning percentage of teams ranked in the top 20 in post-season football polls had lower mean overall winning percentages after 1984 and unranked football teams had higher mean overall winning percentages. Eckard (1998) and Bennett and Fizel (1995) argue that conference

winning percentages better reflect the effect of telecast deregulation on competitive balance than non-conference or overall winning percentages. They posit that television networks affected the non-conference schedules of some teams in the post-regulation period by requesting more games between high-profile "football powers" in order to increase the potential television market for games.

Measuring competitive balance using only conference games is problematic for several reasons. First, conference affiliation played no role in the Board of Regents decision. The Supreme Court ruling applied to all college football games, not just conference games, and the conference affiliation of teams was never mentioned as an important issue. Why then should the impact of this decision be judged only by its impact on conference games? Further, if non-conference schedules changed in response to the decision, then those changes are, by definition, part of the impact of the decision. Any analysis that ignores these games misses some part of the impact of the decision.

Second, over the period 1977-1991, between 20% and 25% of all Division I-A football teams did not belong to a football conference in any given season. Focusing on only conference games ignores over 20% of the Division I-A college football games played during this period, a sizable portion of the sample.

The quantitative analysis of competitive balance literature has focused exclusively on end-of-season winning percentages or winning percentages over longer periods of time. However, the outcome of individual games can also reveal important information about how competitive any game was, and thus shed light on the level of competitive balance. At the level of an individual game, the final margin of victory, the difference between the number of points scored by the winning team and the number of points scored by the losing team, is one possible measure of the competitiveness of a game. The smaller the final margin of victory, the more competitive the contest, other things equal.

One way to test for an impact of telecast deregulation on competitive balance in Division I-A college football is to examine the distribution of the final margin of victory in games before and after the 1984 Supreme Court decision. If this decision had no impact on the competitiveness of individual games, then the average margin of victory in games in the seven seasons before the decision should be the same as the average margin of victory in games in the seven seasons following the decision. If the NCAA's defense of its telecast regulations was well founded, then the average margin of victory should increase following the decision. Formally, we test the null hypothesis

$$H_o : AMV_{'77-'83} = AMV_{'95-'91}$$

against the alternative

$$H_a : AMV_{'77-'83} < AMV_{'95-'91}$$

where AMV is the average margin of victory in all Division I-A college football games.

Table 5: t-Tests on Average Margin of Victory

Null Hypothesis: Average Margin of Victory '77-'83 = Average Margin of Victory '85-'91

Type of Game	P-value	$N_{'77-'83}$	$N_{'85-'90}$
All Games	.017	4094	3841
All Non-conference Games	.005	1440	1296
All Conference Games	.906	1976	1945

Table 5 shows the results of the hypothesis tests. The "All Games" category includes games between Division I-A and I-AA teams, but the other two categories include only games between teams that were in Division I-A each season in the sample period. Clearly, the margin of victory in college football games was larger after the 1984 Supreme Court decision. The average margin of victory was about 0.63 points larger in the post-1984 period. To the extent that closer games are more competitive, the results on Table 4 suggest that the decision reduced competitive balance in college football. The results from two-tailed hypothesis tests ($H_a : AMV_{'77-'83} \neq AMV_{'95-'91}$) were similar.

However, the second two rows of Table 5 show that, as Eckard (1998) and Bennett and Fizel (1995) suggested, the impact of the decision was different for conference games and non-conference games, although not in the direction they predicted. There was no difference in average margin of victory in conference games, but non-conference games were less competitive on average in the period following the 1984 decision. It is difficult to rationalize this difference as due to the influence of television networks on non-conference schedules, because more competitive games should draw larger television audiences, other things equal, implying that television networks would prefer to televise more competitive games.

The increase in average margin of victory overall suggests that there was some basis for the NCAA's defense of its telecast regulations. As one indicator of competitive balance, this result does not support the prediction of imperfect agency behavior.

Competitive balance can also be analyzed using overall winning percentages for teams over a number of seasons. The most commonly used test of competitive balance using data by team and season was first proposed by Noll (1988) and applied to the case of Major League Baseball by Scully (1989). This measure of competitive balance is the standard deviation of the won-loss percentage of the teams in a sports league or conference over some number of seasons. Define $WPCT_{it}$ as the winning percentage of team i in season t. $WPCT_{it}$ is the number of wins for team i in season t divided by the number of games played in season t by team i. This measure of competitive balance for a league or conference composed of $i = 1, 2, ...N$ teams over $t = 1, 2, ...T$ seasons is

$$NS = \sqrt{\frac{\sum_N \sum_T (WPCT_{it} - 0.500)^2}{NT}}. \tag{10}$$

This measure of competitive balance also has an ideal value that depends on the number of games played by teams in a sports league. The idealized value of this measure of competitive balance, NS_I, is the standard deviation of winning percentages if all teams were of equal playing strength. The larger the difference between NS and NS_I, the less the degree of competitive balance over the period. NS_I is 0.15 for teams with 11 game schedules, which is the approximate average number of games played by Division I-A college football teams over the sample period.

There are 1,580 team-seasons in our sample of Division I-A college football teams over the period 1977-1991. 1,213 of these team-seasons consist of teams in conferences and 367 consist independent teams. The overall competitive balance statistic for the sample is 0.23, well above the ideal value of 0.15. Table 5 shows the competitive balance statistics for the entire sample as well as for the eight Division I-A football conferences that existed throughout the entire sample period, broken down into the pre- and post-Supreme Court decision periods. The equality of the standard deviation of winning percentages across these two periods can be tested using a variance ratio test which has an F-distribution. The P-value column on Table 6 is on the hypothesis test

$$\begin{aligned} H_o : &\quad NS_{'77-'83} = NS_{'85-'91} \\ H_a : &\quad NS_{'77-'83} \neq NS_{'85-'91} \end{aligned}$$

based on a standard variance ratio test.

The results on Table 6 show no difference in competitive balance, as measured by the standard deviation of the winning percentage, before and after the 1984 decision, as the P-values suggest that the null hypothesis is accepted in all cases. The results of one-tailed tests ($H_a : NS_{'77-'83} > NS_{'85-'91}$ or $H_a : NS_{'77-'83} < NS_{'85-'91}$) are identical. The results are the same using either conference winning percentages or overall winning percentages. Note that the standard deviations for conference winning percentages cannot generally be compared across conferences because NS_I depends on the number of conference games and each conference does not play the same number of games.

Table 6: Standard Deviations of Winning Percentage

$$H_o : \ NS_{'77-'83} = NS_{'85-'91}$$

	Total Winning Percentage			Conference Winning Percentage		
Group	NS_{77-83}	NS_{85-91}	P-Value	NS_{77-83}	NS_{85-91}	P-Value
All I-A Teams	.237	.238	.86	-	-	-
I-A Conference Teams	.235	.243	.47	.275	.277	.80
ACC	.217	.247	.35	.269	.308	.33
Big 10	.232	.251	.52	.271	.281	.76
Big 8	.289	.224	.22	.314	.218	.41
MAC	.228	.240	.67	.245	.259	.65
Pacific 10	.207	.235	.28	.228	.235	.80
Southeastern	.225	.244	.28	.292	.313	.55
Southwest	.233	.269	.48	.293	.278	.70
WAC	.236	.243	.83	.273	.262	.75

Recall that NS does not reflect changes in relative standings over time. This means that NS for a conference where the same team finished first in each year and NS for a conference where a different team finished first in each year could be identical. If the 1984 Supreme Court decision affected only the relative standings in each year, then this metric might not reflect this type of change.

Humphreys (2002) proposed an alternative measure of competitive balance, the Competitive Balance Ratio (CBR) that can detect changes in relative standings. The CBR scales the standard deviation of the winning percentage, which is essentially a measure of within-league variation in winning percentage, by a team-specific measure of variation in winning percentage. The CBR expresses team-specific variation as a fraction of league-specific variation in winning percentage, so this statistic varies between zero and one.

Table 7 shows Competitive Balance Ratios for all Division I teams and the eight Division I-A football conferences in the sample. This table also shows the P-value on a hypothesis test with a null hypothesis that the team-specific variation in winning percentage, the numerator of the CBR, is the same in the seven year periods before and after the Supreme Court decision. From Table 7, the denominators of the CBRs for each conference are the same.

The results on Table 7 suggest that competitive balance was essentially unchanged across Division I, as shown in line 1. Competitive balance changed within some conferences after 1984 but the direction of the change differs across conferences. A rise (fall) in the CBR indicates more

Table 7: Competitive Balance Ratios

Group	CBR_{77-83}	CBR_{85-91}	P-Value
All D-I Teams	.72	.73	.86
Conferences:			
ACC	.59	.79	.16
Big 10	.63	.59	.35
Big 8	.51	.49	.34
MAC	.73	.83	.16
Pacific 10	.50	.77	.00
Southeastern	.74	.69	.10
Southwest	.62	.67	.17
WAC	.60	.67	.14

(less) turnover in relative standings, and thus more (less) competitive balance within a conference. The CBR rose in five conferences and fell in three conferences. One rise (Pacific 10) and one fall (Southeastern) is significant at the 10% level, although the remaining three increases in the CBR (ACC, MAC, Southwest, and WAC) are nearly significant. Thus the changes in the Competitive Balance Ratios in Table 6 suggest that competitive balance in the Southeastern conference was reduced after 1984 and competitive balance increased in the Pacific 10, ACC, MAC, Southwest and WAC. The differential impact on competitive balance may be due to differences in revenue sharing procedures across conferences. These differences have been documented and analyzed by Brown (1994).

Overall, the evidence on the impact of the Supreme Court decision on competitive balance in college football is mixed. Based on evidence from the outcome of individual games, the decision appears to have reduced competitive balance, as the average margin of victory in some games increased significantly in the period after the decision. This result supports the NCAA position of defense in the case and does not support imperfect agent behavior. Based on evidence from final winning percentages, competitive balance improved within some conferences and worsened in others, although there is no evidence that the overall level of competitive balance changed across all teams in Division I-A. The overall outcome based on winning percentage provides some support for the prediction of imperfect agent behavior.

Attendance

The relationship between telecasts and attendance was debated extensively in the NCAA v. Board of Regents of University of Oklahoma case. The NCAA argued that its regulation of football telecasts was needed to protect the existing market for attendance at football games. The courts rejected this idea, finding no evidence to support it. Understanding the impact of the Supreme Court decision on attendance at football games is important in any analysis of the impact of the decision.

Two previous studies examined the relationship between attendance and television broadcasts of college football before and after 1984. Kaempfer and Pacey (1986) found that telecasts and attendance at games were complements, implying that attendance should increase as a result of the increase in own-game telecasts. Fizel and Bennett (1989) found that although own-game broadcasts and attendance were complements, the overall increase in football telecasts after 1984

led to a decline in attendance after controlling for increases in own-game telecasts.

The basic approach in the literature has been to estimate an aggregate demand function for attendance at college football games. As Kaempfer and Pacey (1986) point out, these aggregate demand functions are additive functions of individual's demand functions for a given market, and thus can be derived from the basic constrained utility maximization problem from consumer theory. As with any empirically viable demand function, the explanatory variables capture the effect of prices, the number of potential consumers, factors that affect the utility associated with attending games, and substitute and complementary activities. The general form of the demand function we use is

$$ATT_{i,t} = \alpha Z_i + \beta X_{it} + \phi C_t + u_{it} \tag{11}$$

where $ATT_{i,t}$ is total attendance at college football games at institution i in season t, Z_i is a vector of variables reflecting those factors that affect demand for tickets to college football games at institution i that do not change over the sample period, X is a vector of variables reflecting factors that affect demand for tickets to college football games at institution i that also vary over the t seasons in the sample, C_t is a vector of factors that affect demand for tickets to college football games in general and α β, and ϕ are vectors of unknown parameters to be estimated. u_{it} is an independent and identically distributed mean zero, constant variance random error term that is assumed to be uncorrelated with the other right hand side variables and captures the effects of other omitted factors on demand for college football attendance. Table 8 describes the variables included in the demand function.

Note that we do not include a ticket price variable in the demand function. Instead, we use implicit variables to capture the effect of ticket prices on demand. These implicit variables are an institution-specific intercept and an institution-specific time trend. We also include the Entertainment component of the Consumer Price Index relative to the total CPI in the empirical demand function. This variable should capture general changes in the price of leisure activities over the sample.

Table 8: Variables in Demand Function

Variable	Description	Mean	Standard Deviation
$W_{i,t-1}$	Total wins by team i in season $t-1$	5.5	2.6
$ENR_{i,t}$	Headcount enrollment at institution i in year t	19.4	11.2
$CAP_{i,t}$	Stadium capacity at institution i in fall of year t	44359	22318
$HG_{i,t}$	Number of home games played by team i in season t	5.6	0.95
$NTV_{i,t}$	National TV appearances by team i in season t	.70	1.3
$RTV_{i,t}$	Regional TV appearances by team i in season t	.87	1.2
P_t	Entertainment component of CPI relative to total CPI	101.8	6.7

There are three problems with including an own-price variable in the demand function. First, no comprehensive source of ticket prices by team for our sample period exists. Kaempfer and Pacey (1986) collected average price data for a football ticket for 72 Division I-A and I-AA teams over the period 1978-1981; Fizel and Bennett (1989) collected average price data for a football ticket for 93 Division I-A teams for 1980-1985; Carroll (1991) collected average price data for a football ticket for 30 Division I-A teams for 1979-1990. However, these studies did not include the same subset of teams.

Second, a single average ticket price to a college football game for a given school may be difficult to measure correctly, and may not reflect the actual cost of attending a game. Athletic

departments are price discriminating monopolists. They charge different prices to many different groups of consumers. Students typically pay an athletic fee that covers admission to football and basketball games whether or not the student attends. Prime seats, and in some cases nearly all seats in a stadium, can often only be purchased after a large donation to the athletic department or an associated athletic booster's club, and most of these can only be purchased as part of a season ticket package. Local businesses who donate to the athletic department may be given tickets to distribute to customers. The visiting team is typically provided with several thousand tickets to each game to sell. And seats in the end zone or far reaches of the stadium often have a different price than seats in other locations. All these factors make the construction of an appropriate "average" ticket price a difficult proposition.

Finally, there appears to be a relationship between the ticket price variable and stadium capacity in the existing literature. Both Kaempfer and Pacey (1986) and Fizel and Bennett (1989) have to interact their price variables with a percent of capacity variable to get the point estimate of the coefficient on price to have the predicted sign. These transformations suggest that the price variable may not be measured well.

The empirical demand function also includes conference dummy variables and an overall time trend common to all schools in the sample. The results of estimating Equation 11 are shown on Table 9. The parameters on the conference dummies, school dummies, and school-specific time trends are not shown. Almost all were statistically significant.

Table 9: OLS Estimates of Attendance Demand Function

$$ATT_{i,t} = \alpha Z_i + \beta X_{it} + \phi C_t + u_{it}$$

Variable	Overall	Power	Non-Power
$HG_{i,t}$	29969*	51195*	24680*
	(1166)	(2918)	(1220)
P_t	-.797*	-1.005	-.861*
	(0.259)	(0.684)	(0.267)
$W_{i,t-1}$	2106*	3120*	1742*
	(396)	(1162)	(405)
$ENR_{i,t}$	2662*	295	3195*
	(913)	(2513)	(935)
Post-1984	-3076	-208	-3476
	(2850)	(7695)	(2935)
$CAP_{i,t}$	.714*	2.39*	.710*
	(0.188)	(0.905)	(0.181)
Trend	9832*	2869	9986*
	(2673)	(3557)	(2508)
$NTV_{i,t}$	3746*	1018	5504*
	(969)	(1687)	(1206)
$RTV_{i,t}$	1741**	1540	2113**
	(835)	(1839)	(911)
N	1622	288	1334
R^2	0.61	0.42	0.42

Standard Errors in Parentheses
*: Significant at 1% level
**: Significant at 5% level

The results on Table 9 are in general correctly signed and plausible. The first column is for the entire sample. Home games, wins in the previous season, and headcount enrollment all raise

attendance. Televison appearances also raise attendance at games, suggesting that telecasts and attendance are complements, and not substitutes as the NCAA argued, and further implying that the NCAA's regulation of telecasts was reducing attendance at games and also revenues earned by college football programs. The parameter on the price of entertainment suggests that as the price of entertainment rose relative to the CPI, consumers purchased less entertainment, including tickets to college football games. The parameter on the post-1984 dummy variable is negative but it is not statistically significant. The overall increase in the number of college football broadcasts did not appear to affect attendance.

Many previous studies have split the sample of institutions when analyzing the impact of the 1984 Supreme Court decision on attendance, because the decision may have had a differential impact on schools. The two rightmost rows on Table 9 split the sample into "Power" schools and "Non-Power" schools. Past studies have split the sample by arbitrary groups of conferences and non-conference schools. We split the sample by the number of national telecasts in the pre-1984 period. Our group of power teams were the roughly 20 teams that appeared on national television four or more times from 1978-1983. However, splitting the sample by conference groups, or including teams with three or more national television appearances, had no impact on the results.

There are significant differences in the estimates from the two subsamples, but the important point is that the post-1984 dummy variable is not significant for either. The p-value on this parameter for the "Non-Power" schools is about .2, so there is some weak evidence that attendance was lower at these schools after 1984. The key differences are that the relative price of leisure, television appearances, and headcount enrollment have no effect on attendance at the "Power" schools. These colleges, listed in the appendix, have national reputations and draw customers to their games from outside their students and alumni, to the extent that the enrollment variable also reflects relative differences in the number of alumni. The increase in attendance from each home game is also much larger for these teams, as is the effect of stadium size.

Revenues

An examination of changes in revenues earned by Division I football programs before and after the 1984 Supreme Court decision can also shed some light on the nature of this regulatory change. Unfortunately, very little school-specific data on revenues by athletic program exist for the period 1978-1990, precluding an econometric analysis of changes in revenues like the proceeding analysis of changes in telecasts, attendance and winning percentages. Some aggregated data on revenues generated by specific athletic programs are available for the sample period. The most prominent source of data on intercollegiate athletic revenues for the 1970s and 1980s is the report by Raiborn (1990), who surveyed the financial condition of athletic programs at a large number of colleges and universities. This study does not report school-specific data, but contains some data on revenues aggregated to the division level from the 1980s. Unfortunately, the aggregation scheme used in the 1970s does not correspond to that used in the 1980s and beyond, making a comparison of revenue data across these decades difficult.

If the 1984 Supreme Court decision on telecast deregulation reduced revenues earned by Division I schools, then the cartel model would be supported as theory clearly predicts lower revenues after the breakup of a cartel. However, little change or an in crease in revenues in the period after 1984 would indicate that some other model of economic behavior might apply to the relationship between the NCAA and its member institutions.

Table 10 summarizes the data on revenues earned by Division I football programs in Raiborn (1990). The nominal revenue data reported in this survey were converted to 1985 dollars using the Consumer Price Index. From Table 10, average revenues rose considerably from 1981 to 1985 in

Table 10: Revenues of Division I Football Programs

	1981	1985	1989
Average Football Revenues	$ 3,169,000	$ 3,735,000	$ 3,776,000
% Change from previous period		18%	1%
Largest Reported Value	$ 7,875,000	$ 10,700,000	$ 14,931,000
% Change from previous period		36%	21 %

Revenues in real 1985 dollars.

inflated adjusted terms but the increase from 1985 to 1989 was not so large. The largest reported revenue in Raiborn's sample also shows a similar pattern. Because the deregulation occurred between 1981 and 1985, the observed changes in revenue from 1981 to 1985 can only be partially attributed to the regulatory change. We do not have adequate revenue data to investigate a cleaner split in the change in revenues before and after the Supreme Court decision. The post-regulatory increase in aggregate revenues suggests, however, that overall, member colleges and universities were better off following the decision. This could be interpreted as an indication of imperfect agency behavior by the NCAA central organization prior to the decision.

4 Conclusions

The principal-agent model of the relationship between member teams and the NCAA central organization provides an alternative and complement to the cartel model as a rationale for the regulatory activities of the NCAA. In general, our model and empirical results are not inconsistent with the cartel model of the NCAA. Imperfect agency behavior could serve to exacerbate the impact of an effective cartel. As an imperfect agent, the NCAA central organization would result in over-regulation relative to a cartel outcome that would be optimal for the team principals. The implication of this model is that the NCAA was able to divert benefits from the member team principals to the NCAA central organization to promote its own interests, such as power and authority.

Our empirical analysis of the 1984 Supreme Court decision that deregulated intercollegiate football telecasts by reassigning property rights to this activity from the NCAA to the individual teams generally supports the prediction of imperfect agency behavior by the NCAA. The position of the NCAA in that suit was that its regulation of football telecasts was in the interest of the member teams by protecting live game attendance and competitive balance through limiting the total number of games that could be telecast and the number of appearances of any particular team. Our analysis of television appearances shows that not only did these increase in total at the national broadcast level, but the characteristics of the individual teams whose games were likely to be telecast changed following the deregulation. Both of these effects support the prediction of imperfect agency behavior by the NCAA. Our findings on competitive balance before and after the Supreme Court decision are mixed. As measured by average margin of victory, competitive balance was reduced following the decision, which does not support the prediction of imperfect agency behavior. As measured by winning percentage, there was no significant change in competitive balance across the division, which supports the prediction of imperfect agency behavior. Our analysis of attendance before and after the Supreme Court decision indicates that NCAA regulation did not have any significant effect on either of these, supporting the prediction of imperfect agency behavior by the NCAA.

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