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AN INVESTIGATION INTO THE MONOPSONISTIC MARKET STRUCTURE OF DIVISION ONE NCAA FOOTBALL AND ITS EFFECT ON COLLEGE FOOTBALL PLAYERS

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I. INTRODUCTION

College football has become big business in the United States with some universities receiving over a million dollars for bowl game appearances[1]. Universities receive revenue from NCAA football through game attendance, direct contributions to athletic funds, contributions to alumni funds because of enhanced interest in the school due to a winning season, and finally for television broadcasting rights[2]. Our paper investigates the possibility that college football has evolved into a market structure much like the big business of professional sports where earlier authors have found evidence of monopsonistic exploitation.

Our paper investigates the organizing behavior of the NCAA. The effects of the organizational rules of the NCAA seem to change the market structure to enhance the characteristic of monopsonistic exploitation. Professional sports share with college football a highly restricted labor market; therefore both are reviewed. Second, a bilateral monopoly model with a price ceiling is presented as a possible explanation of NCAA behavior. Third, an empirical section using two stage least squares is used to estimate the degree of exploitation in NCAA football. Finally, a discussion of policy implications concludes our paper.

II. REVIEW OF THE LITERATURE

Although there have been several articles on monopsonistic exploitation in professional sports, there have been no attempts to model college sports along the same lines. Early articles by Rottenberg (1956), Neale (1964), and Davenport (1969), discuss the organization of professional baseball. These articles have two main themes in common. First is the Louis-Schmelling Paradox. Normally, the market rewards firms who produce the best product. However, in professional sports the market rewards closeness between competitors, because this increases the excitement of the games. Thus, there is an advantage for the firms to have a collusive arrangement to keep the relative skill differential level between the teams to a minimum. Second, these articles found a commonality in the type of market structure consistent with professional sports. Although none of the authors statistically tested the market, they all agreed that the market was monopsonistically competitive.

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In a seminal article, Gerald W. Scully (1974) modeled professional baseball. Using a monopsony theoretic approach and OLS regressions, he found that economic analysis points to the exploitation of the professional baseball player under the reserve clause through the introduction of monopsony power. He used both revenue estimates for the teams and performance characteristics of the players in his empirical model. Scully's overall conclusion is that "empirical analysis confirms the existence of this exploitation and suggests that it is of considerable magnitude."[3]

In a later article, Marshall H. Medoff (1976) further explores the Scully monopsonistic exploitation hypothesis of professional baseball. Medoff's work corrects a simultaneity problem in Scully's analysis by using a two-stage least-squares technique and finds a lower level of exploitation. Nevertheless, Medoff also finds the residual positive and statistically significant.

The literature suggests that monopsonistic exploitation exists in professional baseball because of various competitive labor constraints placed on professional teams by their league rules. Similar constraints on recruiting football players for NCAA teams exist. Indeed, if these constraints are binding, NCAA football players face a market structure which exhibits monopsonistic exploitation. This is theoretically demonstrated elsewhere by Leonard and Prinzinger (1983).

III. MODEL

The NCAA controls conditions for player entry into the world of college football. Not only are there minimum entry regulations, but also there are maximum payment rules that act as price ceilings. One statement of the maximum payment rule that is usually quoted is in Green and Green (1981), "room, board, tuition, fees and required course-related books." Further, the behavior of coaching staffs and college administrators towards NCAA football can be modelled as a profit maximizing enterprise. The coaches of major NCAA football teams have a strong incentive to maximize the number of wins of their teams since their salaries and tenure are at least indirectly related to the win-loss record of their respective teams. The universities are also interested in winning football teams because of direct revenue raised from college football events, additional alumni contributions, and school prestige.

Professional sports and NCAA sports have a commonness in that they both exist in a highly restricted market due to cartelling by their own regulating organizations. One of the characteristics of professional sports is that the players face price discrimination[4]. Both professional teams and NCAA teams have found that quality athletes are a scarce resource. Any one team that wants to have more of a certain quality athlete must pay a higher price to bid such talent away from other teams. This, however, generally results in other members of the team negotiating higher wages thus keeping these salaries relatively in line.

These characteristics are modelled in Figure 1. Each school, like professional sports teams, faces a downward sloping marginal revenue product (MRP) curve for "quality" athletes. These quality athletes are scarce and heterogeneous. Schools therefore bid against each other in order to construct high quality teams. This results in each university facing an upward sloping supply curve for college athletes. This phenomenon can be modelled as a bilateral monopoly, as evidenced by the fact that the high quality athlete faces prospective universities in a one-to-one negotiation.

In the absence of the NCAA, teams would maximize their profits at Q (units of athletic skill). They would pay athletes W and receive a value of V. Scully's and Medoff's studies find the spread betweeen V and W -- or monopsonistic exploitation -- to be significant in professions sports. However, the NCAA is even more restrictive in its market limitations than professional sports leagues. The NCAA does not allow any wage negotiations, but imposes a price ceiling on payments to college athletes[5]. In Figure 1, this is designated as NCAAw.

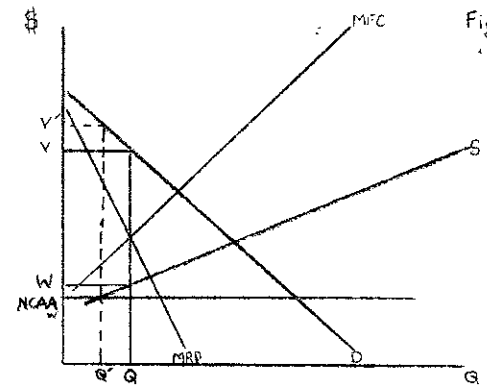

Figure 1

As we can see from Figure 1, if the NCAA price regulation binds, then there is a reduction in high quality players of QQ'. Further, the amount of monopsonistic exploitation increases from VW to V'NCAAw because of the NCAA price ceiling regulation. Thus, the NCAA restrictions designed to protect college athletes from being exploited by the universities actually make the athletes worse off by increasing the amount of monopsonistic exploitation[6].

IV. EMPIRICAL SECTION: PART I

The Regression Analysis

To test our hypothesis that there is monopsonistic exploitation in the market for NCAA athletes, we have built a Scully-Medoff empirical model for NCAA football which was analyzed by two-stage least squares. The empirical model is shown in equations 1 and 2.

$$Att = f(PW, SC, POP, YPC, W, P) \quad (1)$$

$$PW = f(S, SK) \quad (2)$$

Where:

Att = average attendance over the season,
PW = percentage wins to total games,
SC = stadium capacity,
POP = population,
YPC = disposable income per capita,
W = weather,
P = price of ticket,
S = collegiate stars,
SK = players of exceptional skills.

Our sample covers the top forty NCAA Division One football teams ranked by attendance. We used 1981 data reported in the most current NCAA guide (1982).

Attendance is measured by average attendance in thousands at home games for the relevant year as reported in the NCAA football record book (NCAA, 1982). Percent wins is a ratio of the number of wins to the total number of games for each team reported in the same source. It is hypothesized that sports fans are more likely to come watch any particular team if that team has a current record of winning. Stadium capacity comes from the NCAA Football Guide (1982).

Population is measured for the city in which the university is located. 1980 census data were used as reported in the Rand McNally Commercial Atlas (1983). Disposable income per capita was proxied by sales units per city in order to remain consistent with the population numbers (Rand McNally, 1983)[7].

Weather is measured by the mean maximum temperature in October. These were reported for the relevant cities in Statistical Abstracts of the United States (1982).

Ticket prices were found by surveying the athletic directors of all the schools in our study[8]. Both student ticket price per game and non-student ticket price per game were recorded. We note here that part or all of the student ticket price may be included in a mandatory student activity fee. Since the benefit-cost decision of attending a game revolves upon the student ticket price charged as the relevant marginal cost, the student activity fee may be regarded as a sunk cost. Therefore, in our calculations we only used the ticket prices.

Stars were national leaders in NCAA listings of important categories[9]. In professional sports, certain sports personalities cause attendance to increase, we tested to see if this effect applies to college sports. Each team was assigned an additional 1 for each member of the team that was reported in NCAA lists such as leading rushers, leading passers, and leading interceptors.

Teams were given a 1 for each member of the team that we categorized as skilled[10]. We defined skills as any member of the team that attained All-American status or gained a place high on the NCAA all-time list of college athletes possessing certain measured skills and was active in the college ranks during the last two years before the study period. Theory predicts that all exogenous variables would have a positive coefficient except for the price of tickets.

Table 1 shows the results of the regression analysis.

TABLE 1

Regression Results for Football Attendance

Variable	
Intercept	-.86 (-.05)
PW	.21 (2.97)*
SC	.84 (8.94)*
POP	-33.34 (-1.51)
YPC	4.75 (1.00)
W	-.09 (-.50)
P	.24 (.28)
R^2	.73
Regression for Percent Wins	
Intercept	49.43 (10.60)*
S	2.94 (.93)
SK	9.27 (3.19)*
R^2	.27

Note: t statistics are in parentheses and the asterisk indicates 95 percent level of significance.

Attendance was used as the dependent variable because there was insufficient data to calculate revenue figures. Revenue in this case is not made up solely by ticket price times attendance. The actual revenue depends upon contributions by sports fans of the relevant universities, broadcasting revenue, and student activity fees. With the exception of student activity fees, these revenue sources vary as the team's record varies. Furthermore, data on these sources of revenue are not available. Additionally complicating the computation of revenue is the nonavailability of information on the student to non-student mix of ticket sales. After the regressions were run, the attendance figures, which are well-documented and therefore used as our dependent variable, allow us to calculate a matrix of possible marginal revenues for a representative university[11].

The regression results show a statistically significant relationship between attendance and percent wins as well as stadium capacity. Population, per capita income, weather, and price are all statistically insignificant. One possible explanation of these statistically insignificant results is that the average person attending NCAA football games is a college student whose statistics are skewed away from the observable local population variables.

Ticket prices were calculated by averaging student ticket prices and non-student ticket prices. It was also statistically insignificant. This variable was hard to proxy because for students, student activity fees often pay a large part of their actual student ticket price. Furthermore, at many schools, contributions to the athletic programs and/or to the alumni fund are required for various seat availability for non-students. Since the actual mix of student to non-student ticket sales was not available, we also ran the regression just using student ticket prices for one run, and non-student ticket prices for the other run. Prices in these also came out statistically insignificant.

In explaining percentage wins to total games, our results show that both the skills of the players and the intercept term are statistically significant. The stars variable was found to be statistically insignificant, though of the right sign.

V. THE EMPIRICAL SECTION: PART 2

Monopsonistic Exploitation Estimation

Due to a lack of high quality data we can only calculate in a statistically significant manner monopsonistic exploitation for football players who fall into our skilled category. Value of marginal product (VMP) for football players in the skilled category was calculated by multiplying the change in attendance (marginal attendance product) due to change in skills times a series of prices that take account of various student/non- student ticket price mixes. Note that the change in attendance due to the change in skills is a compound change across the two equations. The marginal attendance product (MAP) is calculated by multiplying the effect of skills on percent wins by the effect of percent wins on attendance, or by multiplying the coefficient of the skill variable by the coefficient of the percent wins variable. Since we used per game attendance data in our regression analysis and since the average football team plays 5.5 home games (11 per season), we multiply MAP by the average number of home games per year to get an annualized MAP figure. These calculations are shown in Table 2.

TABLE 2

CALCULATION OF MONOPSONISTIC EXPLOITATION RATES FOR NCAA FOOTBALL

	FOOTBALL			
MAP	PRICE	VMP	SCHOLARSHIP VALUE	WMER
10,932	$ 3.46	$ 37,825	$4,150	.89
10,932	5.14	56,190	4,150	.93
10,932	6.82	74,556	4,150	.94
10,932	8.50	92,922	4,150	.96
10,932	10.18	111,288	4,150	.96
10,932	11.84	129,435	4,150	.97

Note 1: WMER stands for weak monopsonistic exploitation rate and is calculated by the equation WMER = (VMP - Scholarship Value)/VMP.

Note 2: Scholarship value is the mean of the total for room, board, tuition, and fees at the top 40 schools (Cass and Birnbaum, 1981).

From the above table we can see that for football the scholarship value is less than the value of the marginal product. This is clearly reflected in the WMER calculation. Our values of the monopsonistic exploitation rate when compared with those of Scully and Medoff fall in approximately the same range[12].

In unfettered markets a dollar price rations scarce goods among economic agents. By contrast, in a restricted market scarce goods and services are allocated by nonprice competition. Frequently, nonprice competition takes the form of violations of society's pricing rules either explicitly or implicitly. When government sanctions or originates these rules, breaking them is illegal and hence a crime. If a non-governmental body sets up similar rules thus establishing a cartel, it will attempt to give the rules the force of law by establishing economic sanctions to promote conformity with these regulations. However, individual agents who break the nongovernmental body rules can make profits above the cartel norm. As discussed above, there are strong economic incentives for individual university teams to offer student athletes a price above the ceiling set by the NCAA. This the NCAA terms a violation or cheating. When this happens, the NCAA punishes the school involved by both economic (as forbidding television appearances) and moral (branding individuals as cheaters) means.

Even though the NCAA detects and punishes violators every year, violations continue. Some of these violations have the effect of supplementing the college athletes' scholarship wage which brings it closer to the value of their marginal products. In individual cases this would reduce the level of monopsonistic exploitation. While NCAA sanctions punish noncompliance they do not totally prevent

it. For example, Wichita State University has been punished seven times since 1955 by the NCAA (Cance, 1983). As long as the benefit to the university from getting an additional, highly skilled athlete is greater than the cost (scholarship, "additional aid," and expected loss due to NCAA sanctions), the economic behavior which the NCAA terms cheating will continue. Some examples of this are shown in the table below.

TABLE 3

EXAMPLES OF NCAA VIOLATIONS

FOOTBALL

ATHLETE	SCHOOL	VIOLATION	SOURCE	YEAR
G. Stephenson	Berkeley	money	D&S (1975)	1957
C. Lewis	Long Beach	money	D&S (1975)	1972
J. Arnett	USC	money	Rappoport (1974)	1957
D. Meggysey	Syracuse	money	Meggysey (1970)	1962
B. Parrish	Florida	money	Parrish (1971)	1960
A. Karras	Iowa	money	Karras (1978)	1957
D. Kopay	Colorado	money	Kopay (1977)	1961
R. Bleier	Notre Dame	tickets	Bleier (1980)	1969
M. Snell	Ohio State	tickets	Durso (1975)	1963
H. McElhenny	Washington	money	D&S (1975)	1952

Note 1: In many cases the athletes and/or universities are not in violation of NCAA rules as the offer was refused by the athlete and/or made without consent/knowledge of the university.

Note 2: In the sources D&S abbreviates Denlinger and Shapiro.

V. CONCLUSIONS AND IMPLEMENTATIONS

Our empirical analysis is consistent with the presence of monopsonistic exploitation in college football for highly skilled players. Although our tabulated results refer to the weak definition of monopsonistic exploitation, the magnitude of the monopsonistic exploitation rate is so large that it mathematically indicates the presence of the strong version of monopsonistic exploitation as well[13].

As noted earlier in our paper, a sufficient condition for a monopsonistic market structure is an upward sloping supply curve. The empirical model found statistically significant evidence of this type of market structure for highly skilled NCAA football players. The resulting monopsonistic exploitation can be increased by imposing wage ceiling which binds the market. The so-called "cheating" behavior of NCAA football teams is evidence that the market is trying to push prices towards the market equilibrium but is hindered by binding NCAA wage ceiling regulations.

If the evidence is correct, then the exceptional NCAA college football athlete loses wealth due to the NCAA regulations. Removing the NCAA wage ceiling and allowing college football players to receive payment for their services, would allow these people to recapture at least some of their wealth creating activity.

One strong argument against this is that the NCAA wage ceiling regulations are an application of the Louis-Smelling Paradox. By not allowing the larger schools to outbid the smaller schools, NCAA football is more competitive across the board. The resulting closeness of the games attracts more spectators both in total and per game and thus the overall demand for NCAA football increases. Assuming this argument to be correct means that the NCAA football player bears the major cost of the NCAA's attempt to increase the number of spectators[14]. However, as seen in professional sports, there are many other ways to even out the skill levels between the teams. Under the current system wealth is simply being transferred from the college athlete to the schools by increasing the demand for college football. The evidence would suggest that a market where NCAA football players were allowed to bargain with various schools over salary for football services, would transfer wealth towards the football players. Note that because the supply curve has a positive slope means that there will always be some monopsonistic exploitation in this market. Furthermore, if keeping the competitiveness between teams relatively equal is a desired goal, there are alternative methods of skill rationing where the NCAA football player does not bear the major burden of the cost.

APPENDIX

The following table calculated revenues as the dependent variable. The variable notation is the same as in Table 1 with the exception of REV (revenue). Three revenues are used as the dependent variable. REV1 is equal to the student ticket price multiplied by attendance. REV2 is equal to the average of the student ticket price and the non-student ticket price multiplied by attendance. REV3 is equal to non-student ticket price times attendance. It was necessary to calculate revenue in this manner since the mix of student to non-student ticket sales was unavailable.

TABLE 4

REVENUE AS A DEPENDENT VARIABLE FOR FOOTBALL

VARIABLE	REV 1	REV 2	REV 3
Intercept	604.74	387.96	171.67
	(2.06)*	(1.74)	(.57)
PW	1.55	2.19	2.83
	(1.09)	(2.03)*	(1.93)
SC	5.20	7.44	9.68
	(2.83)*	(5.31)*	(5.09)*
POP	981.89	288.11	-406.09
	(2.38)*	(.92)	(-.95)
YPC	-238.89	-85.00	68.97
	(-2.69)	(-1.25)	(.75)
W	-10.88	-7.23	-3.58
	(-3.21)	(-2.80)	(-1.02)
R^2	.48	.56	.50
	PW	PW	PW
Intercept	50.59	50.62	50.35
	(10.83)*	(10.86)*	(10.81)*
S	2.62	2.45	2.64
	(.82)	(.77)	(.83)
SK	8.56	8.69	8.75
	(2.91)*	(3.00)*	(3.00)*
R^2	.27	.27	.27

Note: t ratio in parenthesis. Asterisk indicates 95% level of significance.

ENDNOTES

[1] For example, both teams received $3,300,000 for appearing in the Rose Bowl in January 1984. Chicago Tribune Graphic, 1983.

[2] Sigelman and Bookheimer, 1983.

[3] Scully, 1974, p. 929.

[4] This occurs whenever there is a small number of suppliers of a product and is evidenced by a unit by unit negotiation instead of a single market clearing price. This can be seen in professional sports by the variety of salaries and in the NCAA football by the various values of privileges.

[5] Although it is possible that the price ceiling is set above equilibrium or not enforced, empirical evidence would tend to make the observer believe that the NCAA regulations are at least partially binding. This evidence is to be found in the long history of "cheating" in the recruitment practices of NCAA football teams. If it was a nonbinding market, then there would be a market clearing price with no necessity to "cheat" on the NCAA recruiting regulations. For a more indepth study of this point, see Leonard and Prinzinger (1983).

[6] There are two possible complications to our model of NCAA football team behavior. One is that the NCAA regulations have the effect of evening out the team's capabilities and thus making the game scores closer. This results in more exciting games and hence might result in greater attendance. This does not affect the underlying conditions of the model. It simply has the possibility of shifting the demand curve to the right making the magnitude of the monopsonistic exploitation greater.

Second, the elasticity of the demand curve may vary causing the magnitudes to again vary. The more elastic the demand curve, the less the magnitude of the monopsonistic exploitation. But as long as the supply curve has a positive slope, there will be exploitation, even if the demand curve is perfectly elastic. See Ferguson, (1969).

[7] Both the population proxy and the income proxy are weak because game attendance draws over a large geographic area.

[8] Universities not replying to the written survey were contacted by telephone for the information.

[9] The NCAA does not keep records on each and every college football player. They do, however, keep records of the top 25 or so NCAA football athletes. Because of this, our empirical work is limited to investigating only the top 25 or so players. Our results are also limited by this restriction.

[10] For both the stars variable and the skilled variable a team would be assigned a number from zero to some positive amount equal to the number of players on the relevant list. Note also that one player may have been in both categories. In that case, he was assigned a positive one in both categories.

[11] Regressions were run using a revenue calculation as the dependent variable.

Revenue was calculated and run in three ways. Method one was student ticket price times attendance. Method two was the average of student ticket price and non-student ticket price multiplied times attendance. Method three was non-student ticket price times attendance. All three gave results more statistically insignificant than the attendance dependent variable. These results are shown in Appendix 1.

[12] Scully's monopsonistic exploitation rate ranges from .79 to .91, and Medoff's ranges from .45 to .70. Since due to insufficient data, our calculations omitted broadcast revenues and alumni contributions, our rates are on the conservative side.

[13] The strong version of monopsonistic exploitation is measured using marginal revenue products instead of value of marginal product. For a straight line function, then, the amount of strong monopsonistic exploitation is less than that of weak monopsonistic exploitation, since MRP = half of VMP.

[14] This was proposed in 1956 by Rottenberg for professional baseball. Note that he concluded that a free market would reach the same result. See Rottenberg (1956, p. 247).

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