CHEATING IN THE NCAA: A MODEL OF CRIME IN SPORTS ADMINISTRATION

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CHAPTER I

INTRODUCTION

> crīme, *n.* [OFr. *crime*; L. *crimen*, an accusation, fault, crime, from *cernere*; Gr. *krinein*, to decide, judge] an act committed in violation of a law prohibiting it, or omitted in violation of a law ordering it.
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> chēat, *v.t.* [M.E. *cheten*, to confiscate, seize] to deceive and defraud in a bargain; to deceive for the purpose of gain...[1]

Sometimes cheating is a crime; sometimes it is not. Cheating occurs when a rule is broken. When the rule is established and enforced through the legal system, cheating is a crime. There are, however, many rules that do not originate in the legislature. An example of rule breaking that is not a crime is the cheating that plagues cartels. Cartels adopt rules (usually in the form of quotas for members) that advance the interests of the group. The rules restrict competition, reduce output, raise price, and increase the profits of the voluntary association. Once competition has been reduced, each individual member has an incentive to cheat on the cartel agreement; an increase in output by one firm, the output of other firms constant, increases the cheater's share of cartel (monopoly) profits. Cartel theory emphasizes the difficulty of detecting and

[1]Webster's New Twentieth Century Dictionary, (1983) 2nd ed., Simon and Schuster, New York.

deterring cheating as the source of instability in cartels.[2] While cartels tend to be unstable organizations, some manage to persist in spite of the inherent instability caused by cheating. One cartel that has managed to survive is the National Collegiate Athletics Association.

The National Collegiate Athletic Association

Formed in 1906 as the Intercollegiate Athletic Association of the United States, the National Collegiate Athletic Association (NCAA) began with the stated purposes:

> The regulation and supervision of college athletes throughout the United State in order that the athletic activities in the colleges and universities may be maintained on an ethical plane in keeping with the dignity and high moral purpose of education.[3]

While the initial impetus for its formation was the reduction of violence in intercollegiate football, the NCAA has evolved into an organization charged with many responsibilities. The NCAA's influence has grown to include virtually every aspect of intercollegiate sports. Formally, the organization's purposes are:

- To initiate, stimulate and improve intercollegiate athletics programs for student-athletes and to promote and develop educational leadership, physical fitness,

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[2] See, for example, Demsetz (1968) and Stigler (1971) for a discussion of the "Chicago school" approach.

[3] As quoted in Arthur A. Fleisher III, Brian L. Goff, and Robert D. Tollison The NCAA: A Study in Cartel Behavior University of Chicago 1992 p. 41

athletics excellence and athletics participation as a recreational pursuit.

- To uphold the principle of institutional control of, and responsibility for, all intercollegiate sports in conformity with the constitution and bylaws of the Association.
- To encourage its members to adopt eligibility rules to comply with satisfactory standards of scholarship, sportsmanship, and amateurism.
- To formulate, copyright and publish rules of play governing intercollegiate athletics.
- To preserve intercollegiate athletics records.
- To supervise the conduct of, and to establish eligibility standards for, regional and national athletics events under the auspices of the Association.
- To legislate, through bylaws or by resolutions of a Convention, upon any subject of general concern to the members related to the administration of intercollegiate athletics.
- To study in general all phases of competitive intercollegiate athletics and establish standards whereby the colleges and universities of the United States can maintain their athletics programs on a high level.[4]

The NCAA now includes more than 1,000 member colleges, universities, athletic conferences, individuals and organizations. The colleges that make up the NCAA compete in three divisions, each with its own membership criteria. The athletic competition that occurs in the three divisions include 96 championships administered by the NCAA.

To the basic regulation and supervision of college athletics, economists would add restricting competition,

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[4]The NCAA, National College Athletic Association, Pamphlet No. 8937-10/92, p. 3.

distribution of cartel rents, and monopsonistic exploitation of resource suppliers to the list of NCAA functions. From recruiting to television revenue-sharing, the NCAA sets rules that govern activity in both input and output markets. The output of the NCAA is sports entertainment. The labor of student-athletes represents an important input in the production of sports entertainment. The NCAA attempts to exert market power in both of these markets. While its power in the output market has been limited by the courts, the NCAA is an effective buyer's cartel in the input market.[5] As a resource market cartel , the NCAA attempts to eliminate price competition for the services of student-athletes, thereby reducing the prices paid for these crucial inputs and lowering production costs. The NCAA has very detailed regulations about what student-athletes can be offered for their services. It is in the compensation of student-athletes that the cheating that characterizes cartel agreements usually arises in the intercollegiate athletics cartel.

Cheating in the NCAA

The NCAA and the "cheating" that occurs in college athletics is an excellent case study in cartel behavior. As

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[5]See *Board of Regents of the University of Oklahoma et al. v. The National Collegiate Athletic Association (1982)*. The decision in this case limited the monopoly power of the NCAA with respect to television revenues.

a voluntary association of colleges and universities, the NCAA regulates college athletics. While this regulation is supposed to promote athletic competition, it also restricts economic competition in product and resource markets. Like the members of any cartel, the NCAA member schools are repeatedly found in violation of cartel rules. John F. Rooney Jr. reports on the cheating that occurs in college athletics in The Recruiting Game. From 1952 to 1985, the NCAA placed over 150 schools on football or basketball probation for violations of NCAA rules. In 1984 a study by the NCAA suggested that 30 per cent of Division I schools cheat. In fact, Rooney quotes Walter Byers, the NCAA executive director at the time as saying, "There seems to be a growing number of coaches and administrators who look upon NCAA penalties as the price of doing business--if you get punished that's unfortunate, but that's part of the cost of getting along" (Rooney, p. 147).[6]

While violating NCAA rules is not a "crime", the distinction is superfluous. The identity of the rule maker (the NCAA, OPEC, the legislature, etc.) does not alter the motives of the rule breaker. Rules are broken for individual gain. This is the theoretical foundation of the

[6]This quote underscores a basic contradiction in the NCAA's activities. On one level, the NCAA strives to keep college athletics compatible with academia. On another level, college athletics is a business that primarily benefits athletic, and not academic, interests.

economic approach to crime and punishment. It follows then, that the methodologies developed in the economics of crime literature are applicable to any form of rule breaking, including and especially, violations of NCAA rules. The relevance of this approach is implicit in the manner in which the NCAA responds to rules violations. The Infractions Committee uses the same process as the criminal justice system: rule violations are reported, the allegations are investigated, the defendant(s) are judged, and punishment is meted out to those found guilty.[7]

The NCAA, Market Structure, and Cheating

Industrial organization economists have long pondered the effect of market structure on market performance. The structure-conduct-performance approach introduced by Mason (1939, 1949) and promulgated by Bain (1959), established a framework for economic analysis. The oligopoly market structure (a few firms with significant market share) suggests a decision made by any one oligopolist will depend on the actions and decisions of the other oligopolists. When such an environment leads to collusion, a cartel is formed. Thus, the oligopoly structure gives rise to collusive conduct which affects market performance. One of

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[7] It should be noted that the process by which NCAA violations are evaluated must conform with the standards of due process prescribed for formal criminal justice procedures.

the central problems facing any cartel is the incentive of member firms to cheat on the cartel agreement. Cheating by member firms is simply another aspect of the conduct predicted by market structure. It can be argued, then, that market structure will affect cheating within the cartel.

The NCAA offers a unique opportunity for those interested in cartel behavior, especially in the area of cheating on cartel agreements. The NCAA is a multi-market cartel producing sports entertainment via a number of sports markets--the more "popular" products being collegiate football and basketball. While each of the sports markets are regulated under the same basic NCAA regulations, each operates under fundamentally different market conditions. To illustrate, consider the football, basketball, and baseball markets. If these three sports were organized in a pyramid according to the degree of monopsony power exemplified in each, football would be at the base (because it exemplifies the highest degree of monopsony power), basketball would be in the middle, and baseball would be on top. If a student-athlete possessed equal skills in each of these three sports, he or she would face different labor market conditions depending on the employment choice made. If the athlete decided to pursue a career in baseball, more options would be available to him versus a career in football. This is true because of the differing degrees of monopsony power in each of the markets. A professional football career nearly always requires collegiate play; a professional baseball career can begin immediately after high school. A professional career in basketball can (under hardship rules) sometimes begin without collegiate experience. Thus, the degree of monopsony power differentiates these three sports within the cartel. These two characteristics of the collegiate sports cartel, multiple and heterogeneous markets, are the basis for this dissertation. The unique market conditions under which college athletic departments operate provide an opportunity to link the economics of crime with cartel theory.

Overview of the Dissertation

As prompted by the previous discussion, this dissertation will examine the relationship between market structure and cheating. Specifically, the problem to be attacked is the following: does monopsony power affect the amount of cheating? Investigating this question requires behavioral information from two areas of economic research. The economics of crime provides insight into why economic actors cheat. Cartel theory describes the behavior of the cartel under different structural circumstances. Linking these two areas of economic analysis is the key to solving the problem posed above.

The results of this investigation are organized into five chapters. Chapter II is a survey of the literature covering the economics of sport, cartel theory, and the economics of crime. Chapter III introduces a theoretical and empirical model of crime in sports administration. Chapter IV outlines empirical tests and the econometric results from an applied form of the model. Finally, Chapter V summarizes the results and empirical findings from the applied model.

CHAPTER II

LITERATURE REVIEW

This dissertation investigates the impact of market structure on NCAA violations. The basic methodology of this research represents the convergence of three branches of the economics paradigm. The relevant areas of the literature are: (1) the economics of sport; (2) the economics of crime; and (3) cartel theory. This literature review begins with a survey of the pertinent literature from the economics of sport before turning to the other two literatures.

The Economics of Sport

The economics of sport literature can be usefully organized into three different areas: sports-input market analysis, sports-output market analysis, and studies of NCAA practices. The analysis of sports-input markets centers on the marginal revenue products of athletes, economic rents, and vertical integration. The literature that analyzes the sports-output market centers on the exemption of sports entertainment organizations (including the NCAA) from antitrust legislation and the effects of vertical integration on output markets. Finally, the activities and practices of the NCAA as a sports organization have been evaluated from an economic perspective.

Sports-Input Market Analyses.

James V. Koch has defined the input market in an athletic environment quite clearly in "The Economics of "Big-Time" Intercollegiate Athletics" [Koch (1971)]. Koch recognizes, as others do, the "...NCAA has assumed great power and simultaneously exercises the legislative, executive and judicial functions necessary to the maintenance of an orderly, collusive intercollegiate athletic market."[8] According to Koch, the NCAA typifies cartel behavior in the following ways:

> 1) sets input prices for student athletes, 2) regulates the duration and intensity of usage of these inputs and their mobility during their careers as collegiate athletes 3) regulates the type and particularly the quantity of output of games 4) seeks to pool and divide portions of the cartel's profits 5) makes information available to the cartel concerning transactions, market conditions, and business accounting techniques 6) polices behaviors of the members of the cartel 7) levies penalties against cartel members for infractions[9]

Koch further describes the positions of the market participants. The college or university is a firm; games played between it and rival teams comprise output. The products are differentiated and the university is a multiproduct firm. The inputs used are partial monopoly

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[8] Koch, James V. "The Economics of "Big-Time" Intercollegiate Athletics" Social Science Quarterly 1971 p. 240.

[9] ibid, p. 249.

owners of talent who sell to partial monopsonists. Accordingly, it is the availability of alternatives to non-athletic activities that creates the source of negotiating power for the student-athletes. It is this power which enables him to earn a positive rent.[10] Koch suggests that more complete contracting between the NCAA and professional leagues might dissolve some of the power of the monopolistic sellers in the NCAA.

In a related work by Hall and Lindsay (1980), the input market for American Medical Association medical schools is analogous to that of collegiate athletics. Contrary to the notion that the AMA exists primarily to restrict entry and retain rents, Hall and Lindsay show medical school admissions respond to market factors. They argue that excess demand in the input market is not necessarily a sign of collusion. Hall and Lindsay suggest the excess demand for admissions could simply be indicative of a market failing to clear. The authors examine the NFL to support their hypothesis. Each year, the NFL faces a potential player pool much larger than the number of players it employs. It does not expand, however, to accommodate the potential players; nor does it reduce salaries until the number of people willing to play in the league has fallen to the current number employed. Thus, the authors liken the

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[10] ibid, p. 255.

medical schools' admissions policies to the NFL teams' search for the best quarterback: the best candidate (surgeon or quarterback) probably is not the cheapest. Therefore, excess demand in an input market does not necessarily imply the market is nonclearing. Since excess demand for student-athletes is created by the NCAA restrictions, the Hall and Lindsay reasoning may apply.

A second interesting feature of this paper is its description of medical schools as suppliers of trained physicians who face negatively priced inputs (students). The demanders of the output of medical education are donors. Following Hall and Lindsay, the NCAA can be thought of as a supplier of trained athletes for the professional leagues. These athletes are not negatively priced; but, they are definitely obtained at below-market prices. This connection will be explored later.

<u>Sports-Output Market Analyses</u>.

The exemption of professional sports (and the NCAA) from antitrust regulation is another area of inquiry in the economics of sport. The NCAA claims, like the NFL, that extenuating circumstances differentiate it from commerce typically addressed by antitrust. El-Hodiri and Quirk (1971) examine this differentiation and find it to be lacking sufficient merit to warrant exemption. Within the context of their model, the authors find that sports teams are protected from litigation because, they claim, playing strengths would not be equal otherwise. The authors show, in spite of this, protection from antitrust litigation does not result in equalization of playing strengths. Thus, there must be some other motive behind the league's advocacy of such an exemption.

El-Hodiri and Quirk point out that Congressional activity with respect to sports has been confusing. Baseball has long been exempt from antitrust statues [see *Baltimore Federal Baseball Club v. National League 1922, Toolson v. New York Yankees 1953]*. Yet, in *Radovitch v. National Football League 1957*, the courts held that professional football was not exempt. Since that time, Congress has been trying to reconcile the two disparate treatment of Major League Baseball and the National Football League. Needless to say, organized baseball has an incentive to devote resources to block any Congressional action to resolve the conflict.

In any other form of commerce, rules governing the ownership and acquisition of inputs, territorial rights, and television and radio contracts would constitute illegal restraints of trade. Yet, in professional and amateur athletics, such rules persist.[11] El-Hodiri and Quirk model

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[11]The obvious exception is the decision in *NCAA v. Board of Regents Of University of Oklahoma, et al (1984)* in which the courts held that NCAA could not restrict teams' television contracts.

an n-team professional sports league reflecting some of these practices, where the teams are assumed to be profit maximizers. An essential ingredient in this model is that each team has an incentive to avoid becoming "too" superior. A league with an excessively dominant team will see gate receipts decline. At the same time, gate receipts for home teams increase when the home team has an increased probability of winning. Strategic behavior is suggested since each team's revenues depend in part on what other teams do. Of the several propositions established by El-Hodiri and Quirk, the most important is the idea that equalization of playing strengths and profit maximization are consistent only under a limited set of circumstances.

Myron C. Grauer offers yet another perspective on sports organizations. From a thorough investigation of consumer welfare maximization and the purpose of antitrust rules, Grauer suggests that the NFL (and, by implication, other sports organizations) should be considered a single entity for purposes of antitrust.[12] From a consumer welfare maximization perspective, the NFL is likened to a law partnership. The teams actually are a joint venture that produce one product: football entertainment. Individually, these teams could not produce what they do jointly. As

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[12] Grauer's analysis is motivated primarily by *Los Angeles Memorial Coliseum Commission v. NFL 1982* and *North American Soccer League v. NFL 1982*.

such, it is not capable of intraleague conspiracy and should not be pursued under section I of the Sherman Act. (A conspiracy cannot exist under section I of the Sherman Act among the individuals or divisions of one business entity. [See, e.g. *Joseph E. Seagram and Sons, Inc. v. Hawaiian Oke & Liquors* (1969), *Nelson Radio & Supply Co. v. Motorola, Inc.*(1952), *San Francisco Seals, Ltd. v. National Hockey League* (1974)]. Grauer is careful to point out, however, the NFL or other sports leagues should not be exempt from the antitrust laws nor immune from section I liability. If practices of the NFL (perceived as a single entity) are not aimed at restricting output then the practices must be accepted as attempts to promote efficiency. Judicial interference could therefore produce anticompetitive effects since the NFL has to compete with other forms of entertainment for television revenues.

Grauer further argues, as do El-Hodiri and Quirk, that the financial well-being of each team depends on the success of all the teams in the league. The success of a few teams does not invalidate the position that they should be treated as one entity under the antitrust laws. Further, the internal restraints and agreements made by the league are designed to promote efficiencies in competition for entertainment dollars and these practices should not be challenged. Various player-restraint cases are examined by Grauer and he concludes that the teams acted rationally and not inappropriately in their efforts to compete with other entertainment forms. He reasons that a monopoly can sometimes be lawful; therefore, if it is lawful, there should be no jurisdiction over its buying habits. If, for example, the NFL can achieve some economies through the use of a draft, then it should not be challenged. Grauer suggests that football players should be treated as providers of goods and services to legal monopolies and should not complain if they dislike the terms offered by the monopolies. Rather, players should use collective bargaining to resolve any differences over contract terms instead of the courts. Based on these and other discussions, Grauer offers an alternative view of professional league behavior (and possibly NCAA behavior).

The NCAA and Its Practices.

Studies of NCAA practices provides insight into market structure and performance. Recently, Fleisher, Goff, and Tollison (1992) collaborated on The National Collegiate Athletic Association: A Study in Cartel Behavior, a contemporary discussion of the NCAA which includes several empirical studies. According to Fleisher et al., the NCAA exhibits explicit behavior which qualifies it as a cartel. Indicators of cartel behavior include:

- the presence (at one time) of an exclusive television contract for football events

- increased revenues to coaches and schools with student-athlete compensation remaining fairly constant
- exclusion of school brand-name and other capital assets from NCAA regulations
- inconsistent regulation of other inputs used by schools
- illicit payments
- the marginal revenue product of student-athletes being in excess of the value of the educational product received

Several conditions are necessary to succeed in the pursuit of higher cartel profits. The cartel must have an effective enforcement and punishment system, limitations on alternative means of competing for inputs, and a fairly inelastic supply of inputs. The NCAA has managed to fulfill many of these conditions. The Committee on Infractions is able is issue the "death penalty" for repeated rules violations. The strict recruiting rules and standards governing academic performance effectively limit competition. Finally, it seems the supply of student-athletes is relatively inelastic. Over time, increased demand for the NCAA product has resulted in increased rents available to firms within the cartel.

Fleisher, et al., go on to show that the NCAA is not completely immune from the vagaries of the market however.

Changes in supply, the threat of competition from fringe firms, cheating, and other changing market conditions threaten cartel profitability. Indeed, intracartel competition is fierce in areas not covered by the rules (for example, physical capital). Such internal dissention could possibly weaken the NCAA. It can be shown that those who manage to acquire larger facilities, better players, and better brand-name capital tend to exercise authority within the cartel.

In addition to the overview of cartel behavior, Fleisher, et al., have compiled several empirical studies of the NCAA and its practices. The first of these empirical studies uses logit analysis to predict enforcement using winning variability, direct monitoring costs, amount of cheating, and other probability terms as explanatory variables. Data from Division IA schools over the 1953-1983 period were used. The primary result of this analysis is that consistent winners are not punished as often as variable winners. The authors suggest the cartel uses probabilistic evidence to infer cheating. A secondary result of the research is that crime pays. Those schools put on probation experienced an increased mean winning percentage of roughly 26 per cent (Fleisher, et al., 1992).

The next study tests whether the NCAA votes to restrict entry by imposing academic standards. Specifically, support or opposition of restricted entry is a function of academic quality, demand for athletics, cartel rule breaking and independent affiliation. Using the actual vote on the 1986 SAT/grade point average trade-off proposal as the dependent variable, it was discovered that members do vote to restrict entry.

Finally, Fleisher, et al., test a capture hypothesis. Cartel members can capture control of the regulatory process by securing key committee memberships and voting privileges. The cartel members demand regulation from the NCAA to protect the positive economic rents they earn from restricted competition. Therefore, controlling the supply of regulation is beneficial to cartel members. The capture hypothesis of Fleisher, et al., suggests membership on the enforcement committee will, *ceteris paribus*, be a positive function of the school's mean winning percentage in football. Overall, tests of this hypothesis result in its acceptance.

Another interesting aspect of NCAA behavior concerns enforcement. Fleisher, Goff, Shughart, and Tollison (1987) investigate enforcement techniques of the NCAA football cartel. The so-called "sanity rule" of 1948 governed recruitment and financial aid guidelines. This rule eventually gave birth to an environment rampant with strategic behavior and rules violations. Despite this flagrant cartel behavior, the Supreme Court upheld some of the restrictions on competition in the interest of preserving competitive balance. The authors attempt to model the enforcement of NCAA rules. How, for example, is cheating detected? While the focus of the paper is not on market structure, the observations on enforcement techniques yield useful insights into the supply of offenses theory. Perhaps the most important of these is the fact that student athletes are not paid the marginal revenue product (MRP) their labor generates. As a result, the university captures an economic rent.

Cartel Theory

The NCAA exhibits so many "classic" cartel characteristics, it is, literally, a "textbook" case. Browning and Browning (1989) use the NCAA as an example of a buying cartel in their intermediate microeconomic theory text. The Brownings point out that the NCAA acquired monopsony power as strict recruiting rules were instituted between 1950 and 1970. Limited off-campus visits, one paid student-visit, a national letter-of-intent, and caps on the number and size of scholarships awarded are some of these restrictive rules. According to Browning and Browning, these, and other similar rules, are examples of collusive tactics. The letter-of-intent, for example, is a form of signaling. Once a team has succeeded in "wooing" a player, the letter is a signal to other teams the student-athlete is "taken". In other words, the letter says "Don't waste any more resources on this input." Alternatively, the letter of intent can be viewed as a contract between schools and student-athletes. Since the student-athlete must sit out one year if he or she transfers to another NCAA school, the letter of intent effectively reduces student-athlete mobility and, therefore, reduces competition. Other rules reduce entry and raise the cost of cheating. The recruiting restrictions prevent dissipation of cartel rents to players and families that would otherwise earn them if competition for student-athletes prevailed.

This overall strategy is illustrated graphically in Figure 1. In a perfectly competitive market for S/A labor, w_1 would be the equilibrium wage (determined by the intersection of the market demand and supply curves at point a). At this competitive wage, the firm would imply l_1 units of labor. However, since NCAA rules effectively reduce employment, the wage rate is reduced to w' if the market supply curve is upward sloping. When the market supply curve is positively sloped, the marginal factor cost (MFC) is positively sloped. Thus, the profit-maximizing level of employment occurs where MFC just equals the marginal revenue product (MRP) of labor, or at point c in figure 1. This means the cartel will choose to employ L_2 units of labor and will pay w'--an amount less than the MFC. The NCAA sanctioned wage, w', becomes the only legal payment the school can use to employ student-athletes. Therefore, w' is

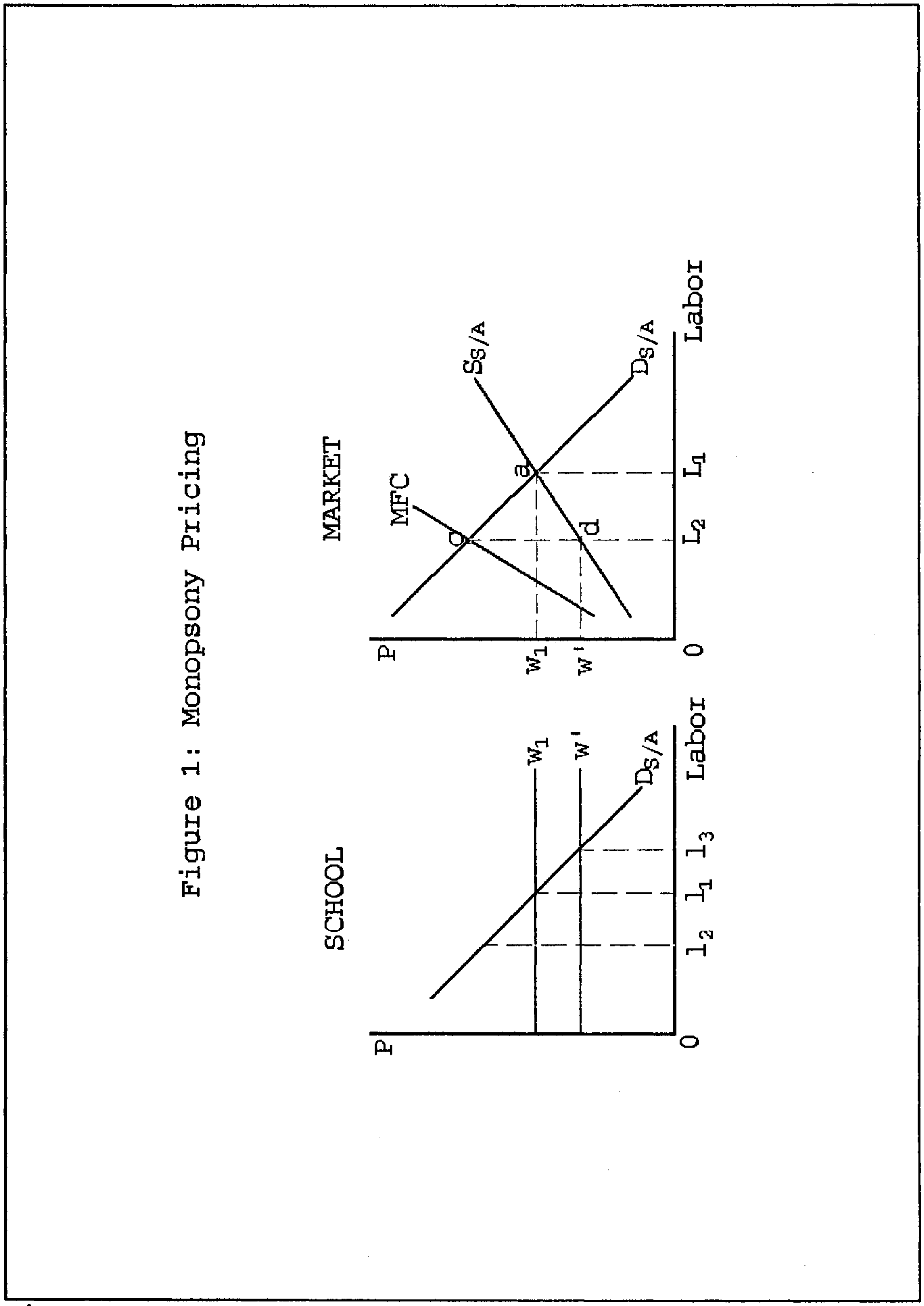

Figure 1 Due to the presence of monopsony power, the school uses l_2 units of labor and earns economic rent equivalent to the distance cd in the Market diagram.

the perfectly elastic wage the school faces. The school will then use l_2 units of labor and will earn a per unit rent which is equivalent to the distance cd in the market diagram. Every team is inclined to reduce its use of athletes to the point where the marginal cost equals the marginal benefit (l_2). By restricting output, the cartel creates rents equivalent to the distance OL_2 multiplied by the distance cd. These rents are captured by member schools.[13]

As illustrated, this strategy results in lower production costs and increased cartel profit so long as members do not cheat. Despite the numerous incidents of cheating over the years, the NCAA still manages to retain significant economic rents.[14] In 1983, television revenues alone were more than $64 million. In fact, the NCAA once had a four-year contract with ABC and CBS to telecast college football games for a total fee of $263 million (the Supreme Court later voided the contract). Since the NCAA is a non-profit organization, rents are not extracted directly. Instead, they are extracted indirectly in the form of higher salaries and other perks like larger expense accounts,

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[13]The graphs are adapted from Browning and Browning Microeconomic Theory and Applications, Fourth Edition, 1992 p. 577.

[14]The terms "profit" and "rent" can be used interchangeably. Revenues minus costs (including opportunity costs) equal rents.

better equipment, and extended travel. As reported in Fleisher, et al., the average base pay for football coaches (in Division I schools) in 1986 was $106,458. This average does not include in-kind and outside compensation.[15] Advertising contracts, housing, insurance and other outside compensation can increase a coach's total earnings by several hundred thousand dollars. In addition, cartel rents are evidenced by the emergence of new and improved facilities, administrative and assistant staffs, and a new NCAA complex in Kansas. With over one thousand member schools, the potential economic rents available to the various athletic programs are substantial.[16] Financially, the incentives for program administrators to cheat are obvious.

Since cheating is a problem common to all cartels, there are very few examples of cartels that have been consistently successful. According to D.K. Osborne, this is true because cartels face one external and four internal problems. The external problem is to predict and discourage production by nonmember firms. The internal problems are really the constraints the cartel faces when it tries to optimize its production: selecting the optimal amount of

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[15] See Fleisher, et al. (1992), p. 85.

[16] Fleisher, et al. (1992) contains numerous data from other sources concerning television revenues, coaching salaries, etc. See, especially, pages 53, 76, and 85.

output, divide output between member firms, detect cheating, and deter cheating [Osborne p. 835 (1976)]. Given these problems, economic theory suggests cartels will be inherently unstable. Osborne argues, however, that a cartel is unstable only if it faces "inherently insoluble problems" [Osborne p. 843 (1976)]. He supports this argument with a mathematical model which implies a quota rule such that none of the problems mentioned is theoretically insoluble. This is not to say cartels will always be stable. Osborne merely explains that stability will depend on the circumstances surrounding the cartel. For example, is the cartel threatened by the emergence of new substitutes? Is the power of the cartel offset by the presence of a buying agency or coalition (as in the case of some raw material producers)? Factors such as these affect stability. Thus, generalized predictions about durability are not justified.

With the incentives to cheat firmly established, what can the cartel do to detect and/or monitor cheating? According to Carlton and Perloff (1990), four factors aid in the detection of cheating in a cartel. They are:

1) a small number of firms,
2) prices that do not fluctuate independently,
3) prices that are widely known, and
4) members that sell identical products at the same point in the distribution chain.

While the first factor might be subject to debate vis-a-vis the NCAA (does 1000+ member "firms" qualify as small?), the latter three factors certainly apply. NCAA "prices" are established by well-documented and widely known rules. All member firms produce roughly identical output within the same point in the distribution chain. Theoretically, cheating should be relatively easy to detect within the NCAA. The problems of detection will be discussed later.

While detecting cheating is certainly important to the effective operation of a cartel, its success also depends on barriers to entry. Again, Carlton and Perloff suggest that "Only cartels that do not fall apart through lack of cooperation and exist where entry is difficult can maintain market power" (Carlton and Perloff p. 209). Fleisher, Goff, and Tollison (1992) point out that the NCAA is subject to lumpy entry conditions. In order to compete with the cartel, an alternative association must be formed. Sports competition cannot be produced by one firm; it takes a minimum of two![17] Therefore, a first mover problem exists in this market. The first school to break away from the cartel must incur substantial start-up costs to form another league. Therefore, the incentive to leave is diminished. For this reason, entry is lumpy; the initial start-up costs

[17] Under certain circumstances, even two teams are not enough. See, for example, the Dream Team performances in Barcelona in 1992.

for potential competitors are very high.

Barriers to entry can also be measured by capital intensity (Carlton and Perloff p. 370). Examining the capital intensity of Division I schools alone hints that barriers to entry are significant if measured this way. Stadiums, training facilities, and other related apparatus are steadily growing in size and cost. This capital intensity deters smaller potential entrants. Another barrier to entry exists in the NCAA rules themselves. Division IA status requires, *inter alia*, an average 4-year home attendance of at least 17,000, a stadium seating-capacity of 30,000 (or be a member of a conference where at least six schools sponsor football and one-half meet the attendance requirement), and a specific minimum number of men's and women's sports. Capital intensity, lumpiness of entry, and NCAA rules imply fairly difficult entry conditions for this market.

The structural differences between colluders and noncolluders have been further examined by Peter Asch and J.J. Seneca [Asch and Seneca (1976)]. Their results are important because they spring from one of only a few empirical studies of cartel behavior.[18] According to Asch and Seneca, this scarcity is due to two factors. The first is the theoretical and definitional ambiguity surrounding

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[18] Other empirical studies include Erickson (1969), Fog (1956), Palmer (1972), and Phillips (1972).

collusive behavior. Sometimes cartels are treated as a special case of monopoly; sometimes game theory and/or strategic behavior types of models are used to illustrate cartel decision making. In addition, some economists (like Machlup and Bain) view most all oligopoly behavior as collusive. This makes empirical investigation difficult. As Asch and Seneca point out:

> Any study of collusion must...confront not only somewhat uncertain performance expectations, but also the direct dependence of these expectations upon the definition of collusion that is adopted [Asch and Seneca p.2].

Despite this difficulty, Asch and Seneca manage to estimate a model which predicts profitability based on structural and other variables. These variables include: length of collusion, advertising sales, compound growth, number of colluders, entry barriers, firm size, risk, and industry concentration. They report, however, that their interpretation of causality is not definite. They suggest three possible scenarios. First, collusion may lead consistently to lower profits. Second, poor profit performance may induce firms to collude. Third, poor collusive performance is simply the most likely to be discovered since antitrust law enforcement is often biased.

Economics of Crime

Aside from the obvious financial rewards, why do schools cheat on NCAA rules? In a broader context, what causes cartel members to cheat on an agreement? Following Becker (1968), a number of studies have attempted to explain criminal behavior with economic theory. While some may object to calling violators of NCAA rules "criminals", the decision making of the potential felon is similar to the potential violator of NCAA rules. The details of these studies will be examined below. The basic approach, though, is one of optimization. The gains from cheating must outweigh the costs if one is to act illegally. Using this kind of analysis, a supply of offenses function can be formed.

The arguments of such a "cheating function" include the marginal cost of cheating, the probability of arrest and conviction, and the marginal benefit of cheating. Turning to the specific case of cheating in the NCAA, the supply of offenses should also be a function of the relative monopsony power of the sport and vertical integration. Again, this relationship between differential monopsony power and cheating forms the basis of this dissertation.

Gary S. Becker and William M. Landes have compiled several studies in their Essays in the Economics of Crime and Punishment (1974). In the preface to these essays, the authors make the point that the key to economic analysis of enforcement (in criminal behavior) is the application of the principle of scarcity. Those that choose to break laws are viewed as rational economic agents who weigh the costs and benefits of both legal and illegal behavior. They own their own labor (which is scarce) and must decide how to best allocate it to maximize their utility. In this respect, many of the models developed in this area are similar to the standard labor supply model. The supply of criminal offenses can be fashioned after a portfolio approach or as a time allocation problem.[19] The time allocation approach is superior in that it allows non-monetary benefits and costs to enter the utility maximization problem.

The seminal piece on the economics of crime is attributed to Gary Becker [Becker (1968)]. He approaches the supply of offenses with a time allocation scheme such that criminal acts will be committed if the benefits exceed the costs of the next-best alternative activity. The supply of offenses is determined by the probability of conviction per offense, the punishment per offense, and a "portmanteau" variable capturing omitted effects. The supply of offenses is inversely related to both the probability of conviction and punishment.

Ehrlich (1973) derives a supply of offenses function via a one-period uncertainty model. His model includes a behavioral function relating participation in illegal activity to the following variables: the wages from legal

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[19] Heineke, J.M. "Economic Models of Criminal Behavior: An Overview" in Economic Models of Criminal Behavior, J.M. Heineke, editor, North-Holland Publishing Co., 1978, pp 3-10.

activity; the wages from illegal activity; a discount factor for illegal wages if apprehended; the subjective probability of apprehension; and the probability of unemployment from legal activities. This behavioral model is operationalized through an econometric specification where the mean, or group, supply of offenses function is estimated. The difference in Ehrlich's approach is his use of both costs and gains from criminal behavior. His results indicate that crime and legal activities are not mutually exclusive--there is an optimal activity mix.

Block and Heineke (1975) are critical of the Becker and Ehrlich approaches. They argue the decision to engage in illegal activity is really a multiattribute choice problem. Accordingly, Becker and Ehrlich have misspecified their particular models. This misspecification vitiates their conclusions, or at least reduces their validity to a smaller subset of circumstances. When the supply of offenses is derived, Block and Heineke show that changes in wealth, payoffs to illegal activity, enforcement, punishment, and the degree of certainty of punishment "...have no qualitative supply implications under traditional preference restrictions."[20]

Another approach is the economics of enforcement as

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[20] Block, M.K. and J.M. Heineke " A Labor Theoretic Analysis of the Criminal Choice" American Economic Review, June 1975, p. 314.

developed by Stigler (1970). The marginal cost and deterrence are important factors in determining optimum enforcement of laws. Stigler views the supply of offenses function as both a production and a consumption function (i.e., theft, smuggling, violating regulations are acts of production while speeding is an act of consumption, etc.). The professional criminal seeks income and chooses an occupation based on the standard labor supply model. Stigler suggests that, in equilibrium, the supply of offenses has the following properties: 1) net returns are equalized and adjusted for risk and costs 2) determinants of the supply function are subject to control by society 3) penalties and chances of detection and punishment are increasing functions of the enormity of the offense.

In a related empirical work, McCormick and Tollison show that "crime" on the basketball court is elastic with respect to enforcement [McCormick and Tollison (1984)]. This paper studies the effect of increased law enforcement on the arrest rate. Specifically, data on the number of fouls called at basketball games when there are two referees and the number of fouls called when there are three referees are examined. The effect of increased "police" is ambiguous; arrests can go up or down. However, an increased probability of arrest results in fewer criminal acts. One of the most interesting observations from this research is the demand for crime derives from the free-lunch theorem--not all crime is worth preventing. In other words, there is an optimal mix of crime and obedience.[21]

McCormick and Tollison test hypotheses with simultaneous models of enforcers and criminals. Data on fouls per game from the complete history of the Atlantic Coast Conference 1954-1983 were used. Similar to other models, the probability that a criminal commits a crime is a function of the expected costs and benefits of crime. The expected costs of crime is the probability of arrest and conviction times the fine of conviction; the expected benefit of crime is the probability of not being detected times the rewards of illegal behavior. The model allows for an arrest whether or not a crime is committed. A sign for the coefficient of the probability of an arrest (with respect to the number of policeman) is shown to be ambiguous. The authors thus try to establish a sign empirically. To estimate the sign, data from the Atlantic Coast Conference were analyzed using Ordinary Least Squares regression analysis. Tests showed that the number of referees had a negative and statistically significant impact on the number of fouls. In fact, the effect of hiring the third official was a reduction in arrests (fouls) by 34 percent.

Of the vast literature on crime and subset of that

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[21] As mentioned earlier, Ehrlich (1973) also suggests an optimal mix of crime.

literature dealing with economic analysis of criminal behavior, the supply of offenses function can be defined and tested. Yet, to date, use of the supply of offenses function in the study of cartel theory is noticeably absent. This dissertation will unite the economics of crime and cartel theory via the economics of sport. In particular, the simultaneous nature of the markets for violations and athletes will be established. Utilizing contributions from cartel theory, the economics of sport, and the economics of crime, a model of crime in sports administration will be developed. The "criminals" in this model may or may not be actual administrators of athletic programs. Rather, the term "sports administration" is used in a general sense; many individuals may have power to act on behalf of a school's athletic program (i.e., the director, coaches, presidents, alumni). By interpreting the term broadly, any and all cheating by cartel members or their agents will be addressed.

CHAPTER III

A THEORETICAL MODEL OF CRIME IN SPORTS ADMINISTRATION

A cartel must inevitably deal with cheating. In the NCAA's case, the Committee on Infractions is responsible for dealing with schools who cheat. Based on the argument outlined in Chapter I, the relative monopsony power between sports may help to explain and/or predict NCAA violations. The investigation of this relationship requires the construction of a model which will examine crime in sports administration. The theoretical foundations of the model will be explored first. Following the theoretical development, the interrelationships between the input market and the violations market will be established. Finally, the determinants of the violations market will be discussed. In chapter IV, an applied form of the model will be presented.

The Athletic Department as a Firm

Standard neoclassical theory models the firm as a profit maximizer. This approach implies behavior which maximizes revenues and minimizes costs. The firm selects the level of output which maximizes its profits and employs resources so as to produce the optimum output at least cost. Although the NCAA is a non-profit organization, the neoclassical model can still be applied for the following reasons. NCAA member schools earn economic rents, as discussed above, from exploitation of the input market. These rents are simply the cartel profits and, since the schools are non-profit, will be dissipated in the form of higher salaries, enhanced facilities, in-kind payments, and other expenses. Thus, the neoclassical model can be adapted to view NCAA members as seeking to maximize economic rents($\Re$).[22]

Rents are maximized from the production of revenue producing sports entertainment. Like any production process, the manufacture of this output generates revenues (R) and costs (C) are incurred. Sports entertainment revenues come in the form of gate receipts, concessions, donations, merchandising, and broadcasting fees (both TV and radio). For the purposes of this study, these revenues will depend on (1) the school's NCAA division status and other athletic affiliations (A), (2) the school's winning percentages ($\wp$) in each of the sports and (3) the NCAA's market power (MKT) in each of the sports. Thus, revenues

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[22]It should be noted, however, that the behavior of the athletic departments with respect to the NCAA could also be modeled within a principal-agent framework. Once membership criteria are met, departments may seek to maximize their own revenue by violating NCAA rules. In this manner the schools benefit from their association with the NCAA while at the same time take actions which undermine the cartel's very existence. This agency theory approach might lend additional insight into certain aspects of departmental behavior, yet the neoclassical view allows for the straightforward development of supply and demand relationships. For this reason, a neoclassical approach is utilized.

can be written as a function:

$$R = R(A, \wp, MKT), \qquad [1]$$

where $\partial R/\partial A>0$; $\partial R/\partial \wp >0$; $\partial R/\partial MKT>0$. The partial derivatives with respect to each variable are positive. This implies that each variable is directly related to revenues. For example, revenues increase as schools upgrade their NCAA divisional status (Division IA being the highest).[23] In higher divisions there is more television exposure, gate receipts are higher (from increased capacity requirements), and concessions generally increase with attendance. Revenues also increase with the success of the teams in athletic competition. Casual observation indicates that attendance and television exposure are both directly related to a team's success. For example, with respect to football, most of the schools with the highest average attendance (Michigan, Oklahoma, Florida, Georgia, Nebraska, and Auburn) also have substantial television revenues (over $12.4 million in 1989). These same schools have historical winning percentages above 60% and have all consistently finished their seasons in the top 20.[24] Finally, revenues

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[23] The following example illustrates the relationship between affiliation and revenue. The University of Tulsa falsified records in men's track in order to meet the requirements for NCAA Division IA status (i.e., 7 sport requirement). As a result, the university met CFA membership requirements and subsequently received a share of the CFA rent distribution totalling $250,000.

[24] See Fleisher, et al, pp. 77-78.

increase with increased market power. As monopsony power increases, student-athletes have fewer employment alternatives. Thus, the schools enjoy increased revenues from the rents earned on the exploited student-athletes.

The costs of producing sports entertainment include payments for inputs (I), such as, labor, capital, supplies, transportation, and (in the spirit of the Byers quote cited previously) NCAA sanctions. These expenses will also be related to the schools' athletic affiliations (A). Therefore, the cost function can be expressed as:

$$C = C(A,I), \qquad [2]$$

where $\partial C/\partial A>0$; and $\partial C/\partial I>0$. The partial derivatives with respect to affiliation and inputs are both positive indicating direct relationships between affiliation and cost and "inputs" and cost. Cost will be positively related to the school's athletic affiliations. For example, Division IA status requires schools to sponsor a minimum of seven men's and seven women's sports. Moreover, costs are directly related to the price paid for inputs. Increases in the prices of equipment, facilities, coaches, and student-athletes will increase the costs of producing sports entertainment.

It should be noted that cost is being used in the strict economic sense, the value of the resource's next best alternative. It is important to distinguish between the economic costs (C) of running an athletic department and the actual costs (C^a). The actual costs will include the dissipated economic rents.[25] In other words, the actual costs could be greater than or equal to the economic costs depending on the value of the economic rents earned. If the department hires several exceptional quality athletes (such that there is a sizeable gap between the wage paid for their services and the MRP each athlete contributes) then the economic rents earned may be used to augment the actual costs of running the athletic program. Conversely, if recruiting efforts do not yield any superior athletes, economic rents earned would be zero and actual costs would equal economic costs.

Formally, the schools' objectives are to maximize the economic rents of producing sports entertainment. The objective function thus becomes:

$$\Re = R(A,\wp,MKT) - C(A,I) \quad [3]$$ [26]

Since revenues and costs are both functions of athletic affiliation, the economic rents will likewise be a function of this variable plus, winning percentage, market power and the price of inputs, or

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[25]Formally, we can define the economic rents as the difference between actual expenses and economic cost, or $\Re=C^a-C$.

[26]This function will have a maximum if we assume that (1) the second partial derivative of the revenue function is negative (i.e., diminishing marginal benefits of winning) and (2) the second derivative of the cost function is positive (i.e., rising marginal costs of producing winning teams).

$$\Re = \Re(A, \wp, MKT, I). \quad [4]$$

This study will hold athletic affiliations constant by examining violations committed by NCAA division IA schools only. Likewise, the relative market power experienced by each sport is assumed constant (as determined by the existing professional sports organizations).[27] In addition, the markets for all inputs except student-athlete labor are assumed competitive with the resulting prices fixed. Assuming away these aspects of the college sports entertainment market reduces economic rents to a function of the success rate of the school's teams, or

$$\Re = \Re(\wp). \quad [5]$$

This study is, in effect, positing the adage: "winning isn't everything, it's the only thing".

The Theory of Production and Athletic Competition

The problem facing NCAA member-schools is to find the optimum winning percent. Sports fans, the consumers of sports production, demand competition. If a team wins "too much", the outcome of any game becomes predictable and competition is diminished. Therefore, the objective for schools is one of optimization versus maximization of winning percentages. This process can be interpreted using

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[27] That is, for any given year, the organization of the professional leagues is assumed fixed. Over time, the market power of the leagues may change.

the standard neoclassical theory of production where output is related to input usage. The ratio of wins to games played is the athletic department's output. This output is produced using multiple inputs. While most production processes use a combination of human and non-human resources, game rules eliminate (for the most part) the direct role that non-human resources play in determining the outcome of athletic contests. The primary determinants of a school's won-loss record will be the labor of (1) student-athletes ($L_{S/A}$), and (2) coaches and other labor inputs (L_{other}). The relationship between output and inputs is summarized using traditional production notation:

$$\wp = \wp\,(L_{S/As}, L_{other}). \qquad [6]$$

The standard theory of production leads us to expect the following partial derivatives:

$$\partial\wp\,/\partial L_{S/As} > 0,\ \partial^2\wp\,/\partial(L_{S/As})^2 < 0$$

$$\partial\wp\,/\partial L_{other} > 0,\ \partial^2\wp\,/\partial(L_{other})^2 < 0,\text{ or}$$

the marginal product of each input is positive but decreasing.

The interpretation of the human resources devoted to the production of athletic success differs from the usual treatment. Since the size of a team is fixed, it is the quality of the labor that is varied rather than the quantity. Athletic departments increase their winning percentages by hiring better coaching staffs, more effective administrators and recruiting more talented athletes. It is here, in the recruitment, enrollment, and maintenance of athletic eligibility of student athletes that crime in sports administration occurs.

The Input and Violations Markets

The demand for inputs is derived from the production function. The production of sports entertainment (and winning percentages) requires student-athletes, other labor inputs, and the facilities and equipment associated with athletic competition. The standard approach witnesses thefirm making input decisions based on marginal benefits and marginal costs of employing the resource. With regard to student-athletes, schools will compare the marginal revenue product (MRP) of student-athletes with the wage they must pay the student-athletes. Specifically, the MRP of the student-athlete is the increase in the won/loss record (the marginal product of the student-athlete, or $\partial \wp / \partial L_{S/As}$) multiplied by the increase in rents from the increase in the winning percentage (or $\partial R / \partial \wp$). Thus,

$$MRP_{S/A} = (\partial R / \partial \wp)(\partial \wp / \partial L_{S/As}) \qquad [7]$$

In the absence of NCAA restrictions, schools will hire student-athletes so long as the MRP exceeds or is equal to the wage. The higher the wage, the smaller is the quantity of high-quality student-athletes demanded and vice versa. This relationship is depicted in Figure 2 panel (a). It should be emphasized that the wage schools pay for student-athletes represents the legal payment as set forth in the NCAA Manual. NCAA rules reduce the payment to student-athletes to w_1 and the cartel captures rents equal to the shaded area in panel (a) in Figure 2.

In the same way, the schools will hire other labor inputs (coaches, trainers, etc.) so long as the marginal revenue product of each of these inputs exceeds or is equal to their respective prices. If the markets for these other labor inputs are competitive, these resources are obtained through price competition and no exploitation occurs.

Since NCAA rules prohibit schools from using price competition to attract/recruit student-athletes, schools will resort to other means of competition. In addition to the NCAA-sanctioned recruiting tools and offers (campus visits, scholarships, facilities, etc.), schools may also resort to non-sanctioned offers. Generically, the latter are recruiting violations. These unsanctioned offers then become part of the demand for student-athlete labor.

Formally, the student-athlete demand function can be expressed as:

$$D_L = D_L(GRANT,\ P_{OTHER},\ V,\ \wp\ ), \qquad [8]$$

where GRANT is the NCAA sanctioned wage, P_{OTHER} is the price of other inputs, $\wp$ is the school's winning percentage in the sport, and V are NCAA violations.

This input demand function is analogous to the conditional input-demand function found in the neoclassical

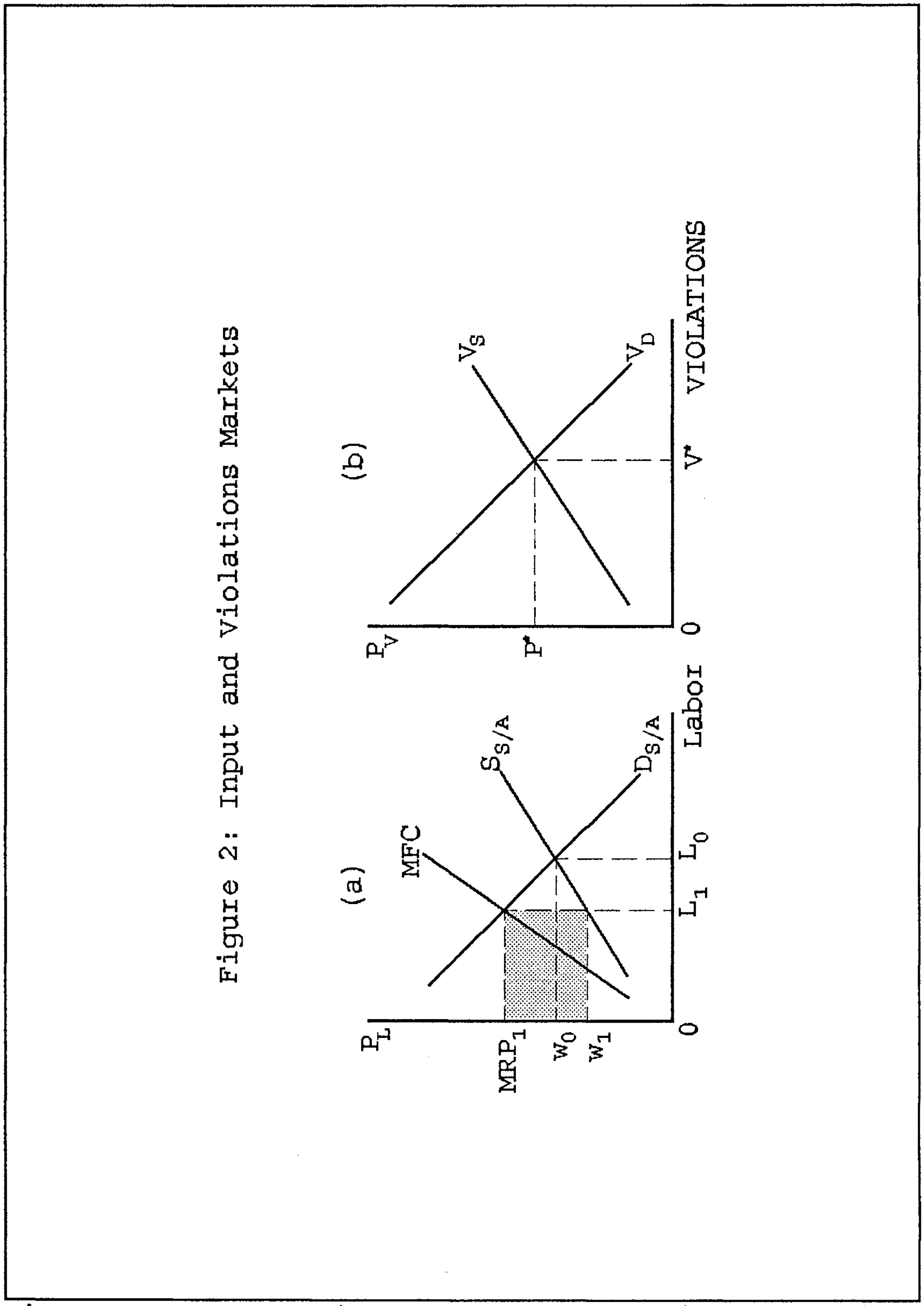

Figure 2 The production of sports entertainment requires the use of S/A labor. The demand for this labor, $D_{S/A}$, gives rise to the production of violations, V_S.

theory of the firm. The demand is a function of input prices and the level of output. As a neoclassical input demand function, we can expect the demand for higher quality student-athlete labor to exhibit the usual characteristics. The demand will be an inverse function of the input's own price, i.e., $\partial D_L/\partial GRANT < 0$. That is, as the value of the legal payment to athletes increases, the gap between it and the MRP declines. Therefore, the potential rent declines as well. With less marginal rent available, the marginal benefit from using one more unit of high quality S/A labor diminishes. Thus, D_L decreases as GRANT increases; there is an inverse relation between quality S/A labor demanded and price. Moreover, since violations are covert means of recruiting student-athletes, the demand will be inversely related to violations, or $\partial D_L/\partial V < 0$. The violations committed add to the total price of quality S/A labor making it more expensive to obtain. It is useful to consider GRANT as the explicit cost of S/A labor and V as the implicit cost. As the number of violations increases then, the units of high quality S/A labor demanded decreases. The cross-price effects will be indeterminate, depending on whether the other inputs are substitutes (in which case $\partial D_L/\partial P_{OTHER}$ will be positive) or complements (in which case $\partial D_L/\partial P_{OTHER}$ will be negative). Finally, the demand for student-athlete labor will be an increasing function of the output (winning-percentages) so that $\partial D_L/\partial \wp$ is positive.[28]

The input demand function described above is simultaneously a production function for the school. Since NCAA rules fix the number of athletes teams may use, fierce competition for better quality athletes arises. Recruiting can then be viewed as a production process where schools, or agents acting on behalf of schools (representatives of athletic interests) supply violations and other inputs (such as facilities, past won/loss records and a basic scholarship) to recruit more talented athletes. Therefore, just as the production of sports entertainment creates a derived demand for quality student-athletes, the demand for student-athletes creates a willingness to supply, or produce violations.[29] This intuitive link will be examined further below. In the pursuit of better won/loss records and the higher rents athletic success produces, schools have an incentive to cheat on the NCAA sanctioned wage. By cheating, and offering star student-athletes cash or in-kind

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[28]This is equivalent to assuming that the output elasticity of student-athlete labor is positive, or $(\partial L_{S/A}/\partial \wp)(\wp / L_{S/A}) > 0$.

[29] It should be noted that this treatment of the supply and demand for violations is rooted in the economics of crime literature. A more typical approach might view the demand for cheating as emanating from the firm (i.e., cheating is just another input the firm demands to produce its output). While this view is more traditional, the approach taken here reflects the influence of the criminal behavior models discussed in the economics of crime section of chapter II.

benefits that exceed the NCAA-defined legal maximum, the schools can obtain more talented athletes and increase their winning percentages and their economic rent. Thus, the demand for student-athletes translates into a supply of violations as illustrated in panel (b) in Figure 2.

To more fully explain this reciprocal relationship between demand and supply, an adaptation of John Stuart Mill's reciprocal demand model (as interpreted graphically by Edgeworth and Marshall) is depicted in Figure 3. First, consider panel (a) in Figure 3. The vertical axis represents varying qualities of S/A labor (with poorer quality labor near the origin and higher quality away from the origin). The horizontal axis represents quantities of violations (V). The line 0U indicates an athletic department's willingness, *ceteris paribus*, to exchange NCAA rules violations for star athletes. Other things equal, we can expect schools to commit more violations for more star athletes, i.e. 0U will be upward sloping. Moveover, neoclassical theory would predict a declining marginal willingness to cheat since the marginal product of student-athlete labor ($\partial \wp / \partial L_{S/A}$) is subject to diminishing returns. This accounts for the increasing slope of 0U.

The line 0P in Figure 3(b) indicates the terms of trade, i.e. the number of violations required to acquire a given quality of star athletes. The flatter this line, the more expensive student-athlete labor is in terms of

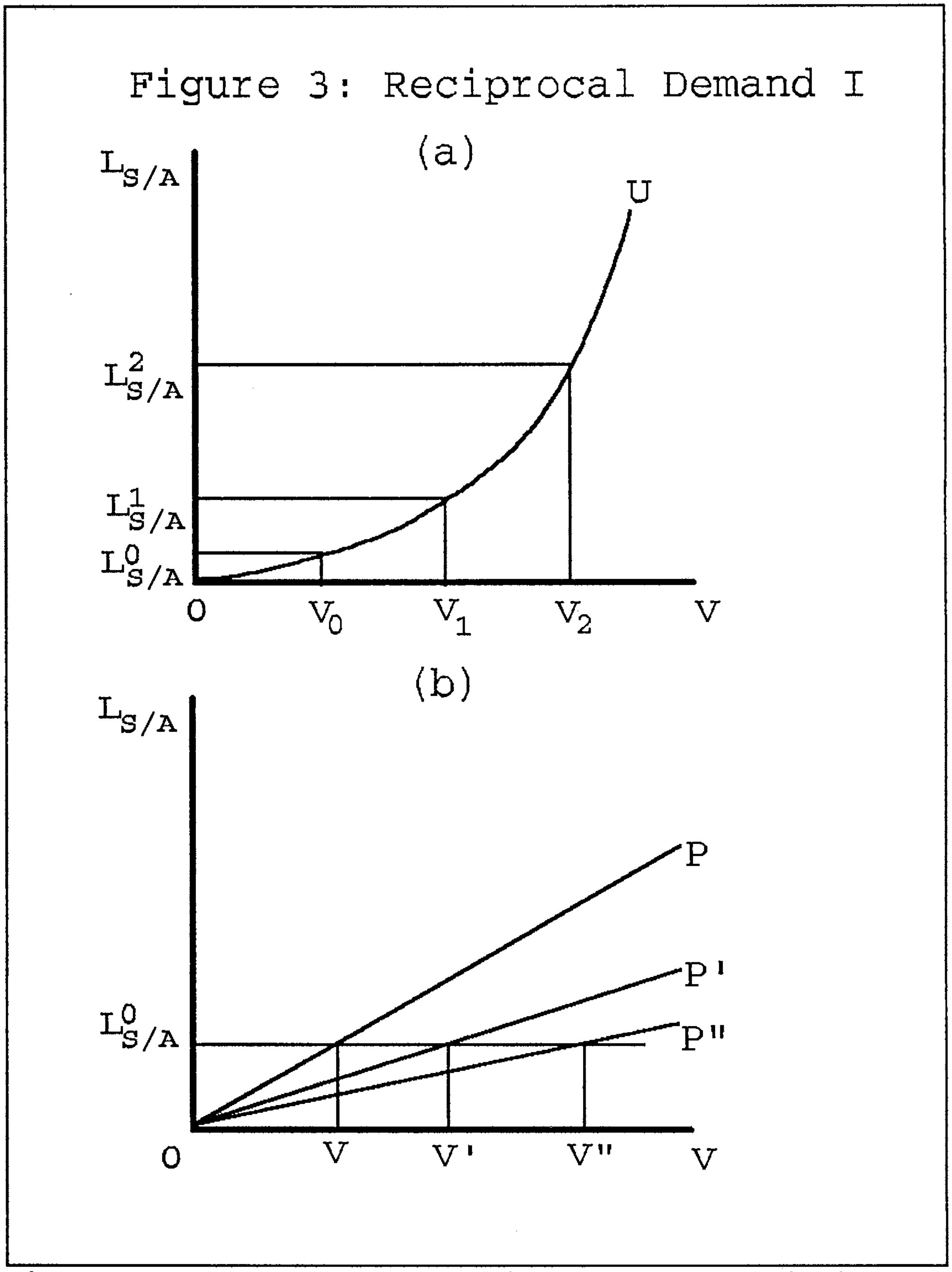

Figure 3 The offer curve, OU, illustrates the willingness of a school to offer violations to secure better quality S/As. The rays, OP, OP′, OP"" reflect the terms of trade between quality and violations.

violations. As the slope of OP increases, more star-quality student-athlete labor can be acquired for any given number of violations. Take, for example, the amount of labor $L^0_{S/A}$. To acquire this amount of labor, a school must commit V, V′, or V" violations as the terms of trade move from OP, to OP′, to OP".

The willingness-to-cheat curve, OU, can be used to derive a demand for student-athlete labor. Additionally, a supply of violations curve can be derived from the same sets of curves. The school will select a combination of violations and student-athlete labor based on the terms of trade. The equilibrium combination, a la Mill/Marshall, will be at the intersection of OU and OP. Taking all alternative terms-of-trade (price) lines and finding the OP/OU intersections produces two sets of data: (1) a collection of price/labor quantity data, and (2) a collection of price/violations data. This information can be translated to the conventional format found in panels (a) and (b) in Figure 4.

The relative (in terms of violations) price of quality student-athlete labor is on the vertical axis of panel (a) in Figure 4 while the quality of student-athlete labor is on the horizontal axis. The prices p, p′, p" from Figure 3 panel (b) are transferred to the vertical axis in Figure 4(a). For each of these prices, the quality of labor demanded is shown by the demand for student-athlete labor

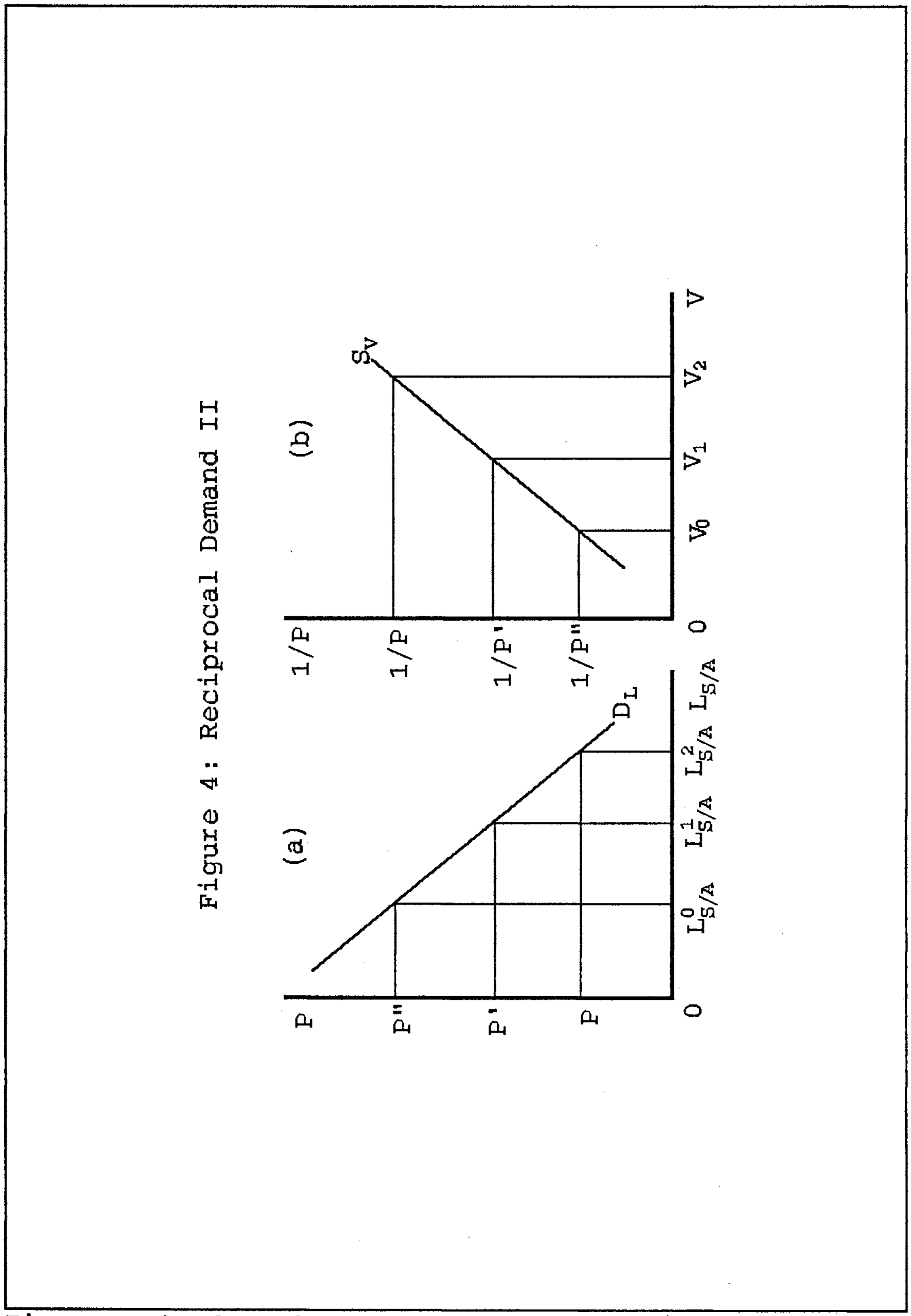

Figure 4 The demand for S/A labor results in the supply of violations.

curve, D_L. Now, for each point on the curve D_L, there is a corresponding number of violations produced to secure the desired quality of S/A labor. Figure 4(b) illustrates the supply of violations function generated from the demand for quality S/A labor. The demand function in panel (a) is equivalent to the supply of violations in Figure 4(b).

The key to this simultaneous relationship is the effect the NCAA cartel has on the behavior of the school and its agents in the production of sports entertainment. Because of the NCAA cartel, the school acts as a monopsonist in the labor market; this behavior is captured in the demand for S/A labor. At the same time, the very existence of the cartel creates economic incentives for the schools to cheat on the sanctioned wage; this behavior is captured by the supply of violations. Thus, the production of sports entertainment results in participation in a labor market which is, at the same time, a violations market. Consequently, the behavior of the schools can be studied and described from either perspective.

Focusing on the violations market, the supply of violations defines the general willingness of schools to break NCAA rules. The economics of crime literature indicates that the willingness to break rules (laws) will be influenced by the costs and benefits of cheating. As the benefits of higher winning percentages rise, the willingness to cheat will also increase. A higher marginal product of student-athlete labor will also increase the willingness to break rules as will increased monopsony power. This latter influence reflects the higher marginal rents available from exploitation of student-athlete labor. Sports with greater monopsony power (i.e., football and basketball) have the potential to earn higher rents from cheating. The potential costs of cheating (forsaken television revenues, etc.) will deter violations as they increase. Following the economics of crime literature, what matters is the expected costs: the penalty multiplied by the probability of punishment.

Given the influence of the crime literature, a supply of violations function can be presented formally as:

$$V_s = V_s(P_v, \text{MKT}, \text{FINE}, \text{PROB}) \qquad [9]$$

where V_s is the quantity of violations supplied; P_v is the price of violations; FINE is the costs of cheating (the NCAA imposed sanctions); MKT is the degree of monopsony power; and PROB represents the probability of being caught and punished. From the preceding discussion, we would expect the following relations:

$\partial V_s/\partial P_v > 0$,

$\partial V_s/\partial \text{MKT} > 0$,

$\partial V_s/\partial \text{FINE} < 0$, and

$\partial V_s/\partial \text{PROB} < 0$.

The price of violations, P_v, represents the marginal rent the school gains from cheating (the distance between the demand curve and w_1 in panel (a) of Figure 2). The gains from cheating are reflected by the marginal rent available to the team from supplying violations. Therefore, the higher P_v is, the greater is the supply of violations and vice versa. Similarly, as monopsony power increases, the potential economic rents increase. For this reason, the supply of violations also increases with increased market power. Higher marginal costs of cheating discourage violations. Increases in the probability of punishment and/or sanctions will reduce the supply of violations.

On the input side, student-athletes are viewed as utility maximizers where utility is a function of income. The decision to supply labor can be viewed as a portfolio allocation problem, where the objective is to maximize:

$$U = U(Y_1, Y_i) \qquad [10]$$

where utility, U, is a function of Y_1, income earned from the selection of a college sports program, and Y_i, income earned from alternative employment opportunities. Neoclassical economic theory assumes that the relationships between these variables are such that $\partial U/\partial Y_1 > 0$, $\partial^2 U/\partial (Y_1)^2 < 0$, $\partial U/\partial Y_i > 0$, and $\partial^2 U/\partial (Y_i)^2 < 0$. The income defined by Y_1 includes sanctioned offers and the extra benefits from illegal offers. This utility maximization process results in a supply of labor function.[30] Traditionally, the student-

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[30] It is assumed that S/As realize there are a limited number of positions available for any particular program and a large pool of applicants. Therefore, it is the utility maximization of the most talented athletes that is described

athlete will supply sports labor for a particular program so long as she or he receives an in-kind (as allowed by NCAA rules) or cash (in violation of NCAA rules) payment in excess of her or his opportunity cost. Since the supply of labor depends in part upon the extra benefits from illegal offers, it follows that the demand for violations (by S/As) is derived from the supply of labor decision.

As explained previously, this simultaneous relationship can be illustrated with the Mill-Edgeworth-Marshall reciprocal demand model. Figure 5 shows the student-athlete side of the trade-offs illustrated in Figure 3. In Figure 5, panel (a), the vertical and horizontal axis remain labeled as in Figure 3(a). Focusing on the supply of student-athlete labor and demand for violations, it is evident that the flatter the line 0A, the greater is the number of violations demanded to secure a given amount of student-athlete labor. Also, for increasing quantities of labor along a given willingness-to-cheat curve, the quantity of violations demanded increases. Thus, in Figure 5(b), a supply of student-athlete labor function is shown as S_L and it is simultaneously equal to the demand for violations function, D_V in Figure 5(c). This demand for violations will exhibit the usual characteristics of neoclassical demand theory and the economics of crime literature.

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above.

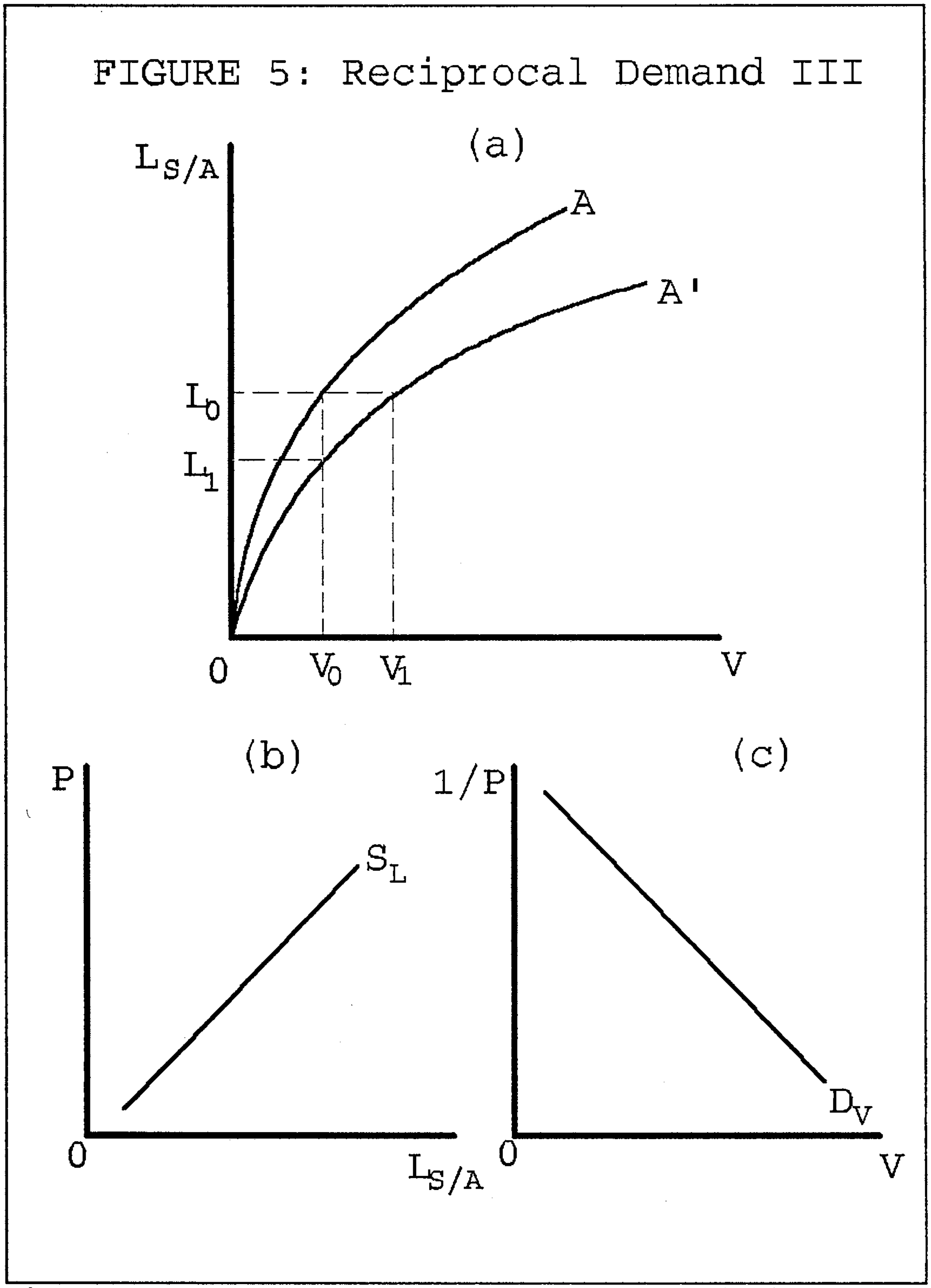

Figure 5 The offer curve, OA, reflects the willingness of a S/A to exchange labor for violations. As the offer curve rotates to the right, more violations are required to secure the same amount of quality labor.

Formally, the demand for violations is defined as:

$$V_d = V_d(P_v, \text{GRANT}, \text{PROB}) \qquad [11]$$

where P_v is the price of violations, as described above; GRANT is the basic grant (legal offer) provided to athletes; and PROB is the probability of losing collegiate eligibility for violating NCAA rules. Based on neoclassical demand theory and the economics of crime literature, we can expect:

$\partial V_d / \partial P_v < 0$,

$\partial V_d / \partial \text{GRANT} < 0$, and

$\partial V_d / \partial \text{PROB} < 0$.

The willingness of student-athletes to violate NCAA rules will be inversely related to the NCAA sanctioned benefits and the probability of being punished. The product of these two variables represents the expected costs of crime. The relationship between the willingness to cheat and the price of violations is somewhat convoluted, since the price of violations is defined in terms of the benefit to the school (the difference between the marginal revenue product of student-athletes and the payments to student athletes) of violating NCAA regulations.

There is a relationship, then, between the price of violations and the willingness of schools to cheat. As the price of violations rises, the schools' willingness to cheat increases because the reward, to the school, is rising. The divergence between the marginal revenue product and the official wage is the result of monopsony power. The greater the market power of the schools, the fewer the alternatives left to the student-athlete, and, *ceteris paribus*, the less willing student-athletes will be to cheat. Therefore, for larger deviations between MRP and the sanctioned wage, the student-athletes will desire fewer violations. Accordingly, for smaller marginal rents, more violations are demanded. For larger marginal rents, less violations are demanded.

Student-athletes are utility maximizers and schools are rent maximizers. The behavior of both participants can be described by the standard neoclassical theory of optimization. From this optimization activity, the traditional input demand and labor supply functions are derived. The input demand and labor supply functions, in a Mill-Edgeworth-Marshall framework, imply supply of and demand for violations. This framework can be used to further explore the connection between these two markets.

Consider Figure 6, which brings Figures 3 through 5 together in one set of graphs. The curve OU in panel (a) defines the willingness to cheat in athletic programs. The OU curve, as noted above, can be used to define both a demand for student-athlete labor curve and a supply of NCAA violations curve as illustrated in panels (b) and (c). The OA curve in panel (a) shows the student-athletes' willingness to trade student-labor for violations. This curve can be used to derive a student-athlete labor supply and a demand for violations, which are illustrated in panels

Figure 6: A Model of Violations

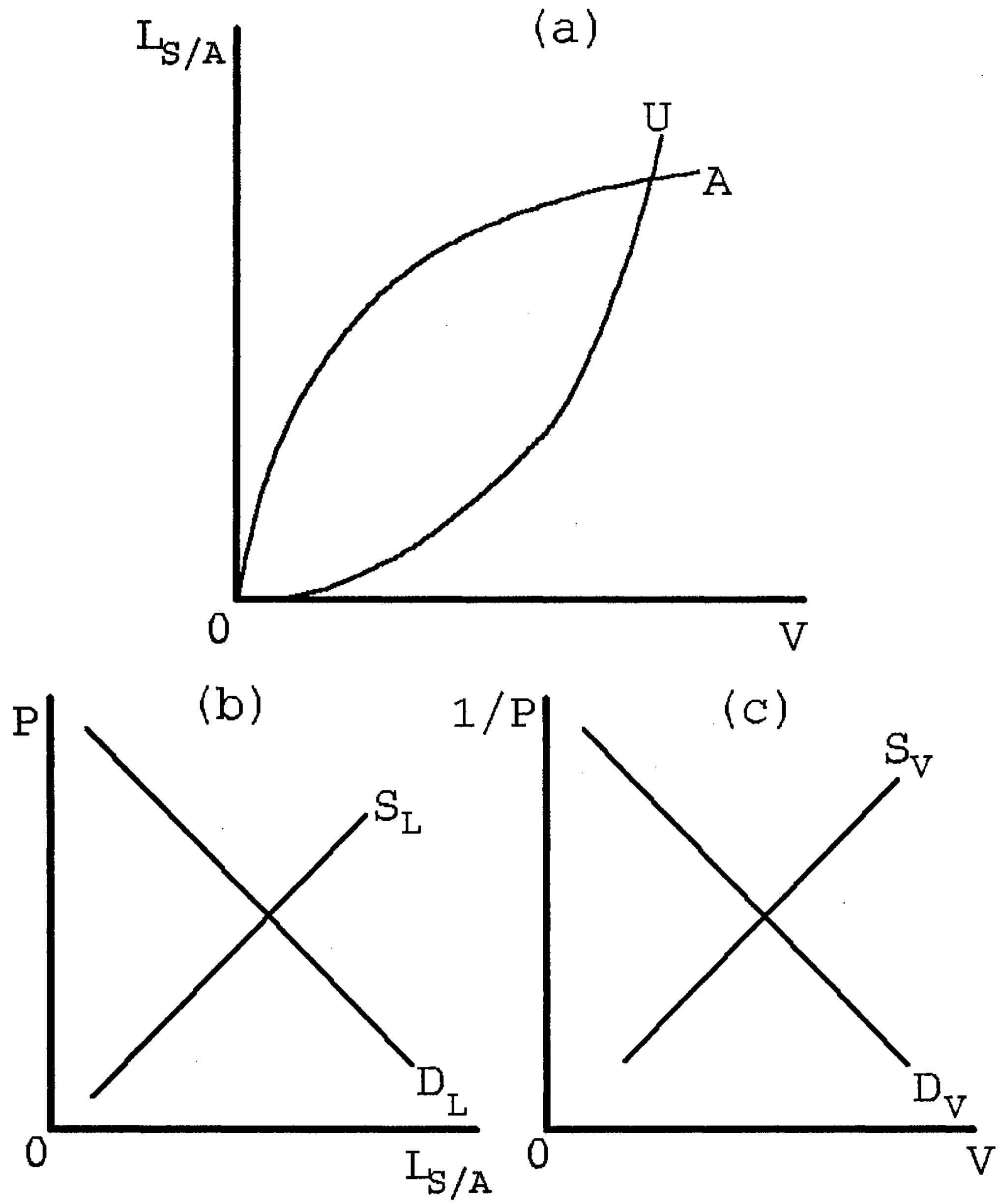

Figure 6 The intersection of the offer curves, OU and OA, defines an equilibrium in both the labor and violations market.

(b) and (c), respectively. The results of this process are two markets which clear simultaneously. It is the intersection of the two willingness-to-cheat curves which provides equilibria in the two markets.

With the simultaneous nature of these two markets established, estimation of only one of the markets is necessary to address the questions outlined in this dissertation. Hence, the applied model will deal solely with the violations market. Once supply and demand functions for violations are estimated, hypothesis tests can be performed. The results of these tests can be extended to the input market. Chapter IV presents the model in an applied form.

CHAPTER IV

AN EMPIRICAL MODEL OF CHEATING IN SPORTS ADMINISTRATION

An applied form of the theoretical model outlined in Chapter III must be assembled to test the hypothesis of this dissertation. This applied, or empirical, model will be fashioned in such a way as to render it "estimatable" through the use of econometric techniques. The empirical model consists of three endogenous variables: the quantity of violations supplied (V_s), the quantity of violations demanded (V_d), and the price of violations (P_v) and four exogenous variables the costs of sanctions (FINE), the degree of market power exercised by the NCAA schools (MKT), the potential loss to student-athletes of NCAA sanctions (GRANT), and the probability of being punished (PROB). Data for collegiate football, basketball, and baseball are used to test the hypothesis that the market for violations is dependent on market structure.

Observations for the violations variables, V_i, are taken from the NCAA's *Enforcement Summary of Division I Schools*. This summary details all of the assigned penalties for schools in the sample. The data are discrete; the number 1 is used to signify a penalty while 0 is used otherwise. Because of the nature of this variable, a limited dependent model is utilized. This approach is explained below.

A proxy must be used for the price of violations. Because this price represents the deviation between the marginal revenue product of student-athletes and the sanctioned NCAA wage, an estimate of the difference between the two is calculated. Specifically, average annual professional salary data for each of the three sports serves as a proxy for student-athlete marginal revenue product while disaggregated scholarship expense data is used for the NCAA sanctioned wage. (Details are provided in Appendix A). It is expected that P_V will be positively related to V_S and negatively related to V_D.

The cost of sanctions, FINE, is measured as the marginal increase or decrease in television revenues earned by each school lagged one year. First, won/loss records were compiled for all schools in the sample. Next, the change in the winning percentage for each school and sport was multiplied by the television revenues available to each school each year.[31] Thus, for example, teams experiencing a decrease in the number of games won are assigned a negative value for the FINE variable for that year. This method was used in Fleisher, et al. (1992). It is hypothesized that those schools coming off of a losing season will be more likely to cheat. Therefore, an inverse relationship is

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[31] Revenues available were defined by an average of disbursements made to member schools over the period.

expected between FINE and V_S.

The market power variable, MKT, is captured by a ratio of graduation rates. The student-athlete graduation rate of those completing eligibility is divided by the graduation rate of all other student-athletes. Thus, a value for this ratio greater than one signals relatively more monopsony power while values less than one signal relatively less monopsony power. The reasoning behind this is as follows. Student-athletes participating in sports with greater monopsony power will tend to exhaust eligibility before graduating. Student-athletes with more alternative employment opportunities (baseball and basketball players) will graduate less often than student-athletes participating in sports with more monopsony power (football players). A collegiate baseball player can leave school, enter the farm system for Major League Baseball and matriculate into the big leagues. A collegiate football player does not generally have a similar option. Thus, the ratio will increase as monopsony power increases (i.e., increased monopsony power leads to more students completing eligibility). For this reason, the relationship between MKT and V^S is expected to be direct.

The potential sanction faced by student-athletes, GRANT, is estimated as the average net present value of the basic grant multiplied by the number of student-athletes for each sport. For example, in 1985, the average net present value of the basic grant was $7,000 per student. The average football roster for schools in the sample carries 100 athletes. Thus, the GRANT total for football in 1985 would be $7000 x 100 = $70,000. The student-athlete's demand for violations should decrease with an increase in GRANT. In other words, the smaller the deviation between the legal payment (GRANT) and the student-athlete MRP is, the smaller the quantity of violations demanded will be.

Finally, the probability of punishment, PROB, is estimated from the NCAA data on enforcement. Specifically, a ratio of punishments to estimated violations was calculated. This ratio was then multiplied by 2 if the team experienced an increase in winning percentages from the previous season. Anecdotal evidence suggests schools which experience increased wins are often viewed with more suspicion by other NCAA members. Thus, it follows, they are more likely to "get caught" after a winning season. Both V_S and V_D are expected to be inversely related to PROB.

Getting caught and being punished discourages cheating on both sides of the market. Observations on these variables are limited to schools which have football, basketball, and baseball programs competing in Division IA and for which data were available. Specifically, the sample includes the following conferences:

Atlantic Coast,

Big East,

Big West,

Big 10, and

Big 8.

There are 891 observations on 7 variables spanning the time period from 1983-1991.[32]

As with many econometric studies, limitations on the type of data available occurred. The following paragraphs define the nature and source of the data used including the construction of proxy variables. Several proxies were used due to the fact that some of explanatory variables are "unreported". For example, although some anecdotal evidence exists about the magnitude of illicit offerings to S/As, no one knows the precise dollar value of the covert transactions that are never revealed.

Observations for the supply and demand of violations (V_i) were taken from the *NCAA Enforcement Summary*. This summary reports public disciplinary actions taken by the Committee on Infractions or the NCAA Council from October 16, 1952 to May 1, 1991. As explained in the text, the number 1 was used to signify a penalty and 0 was used otherwise for every school and sport each year sampled.

The probabiliity of punishment variable, PROB, was measured using the enforcement data. A probability ratio of

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[32] Data sources include: NCAA Enforcement Summary, NCAA News, College football U.S.A., Chronicle of Higher Education, World Almanac, NCAA Annual Reports, and athletic departments of various division I schools.

actual penalties to estimated violations was constructed for each year. Estimated violations are based on anecdotal evidence which suggests that approximately 30 percent of schools cheat. Thus, the denominator of the probability ratio is equivalent to 30 percent of the total Division I schools for each year. For example, in 1984 there were 988 Division I schools with approximately 300 competing at the IA level. Roughly 100 (30 percent) of these schools probably cheated. There were 6 violations reported that year. Thus, the probability of getting caught is taken as 6/100 or 0.06. This ratio was multiplied by 2 if the team experienced an increase in winning percentages from the previous season.

The price variable, P_V, is constructed as the difference between what the S/A could potentially earn in the professional market (reflecting the S/A MRP) and what he legally receives as a S/A. Average annual salary data was taken from Baseball and Billions: A Probing Look Inside the Business of Our National Pastime, by Andrew Zimbalist (Basic Books, New York, NY) 1992, p.88. The grant information was taken from a study by Mitchell H. Raiborn entitled "Revenues and Expenses of Intercollegiate Athletic Programs", (NCAA, Overland Park, KS) 1990, p.32-37. The difference between the two for each sport each year comprises the proxy for P_V. Additionally, observations for GRANT were also taken from the Raiborn study. GRANT, as described in the text, is the average net present value of the basic grant multiplied by the number of S/As carried on a roster for each sport.

The components of the FINE variable include won/loss records and television, bowl game, and tournament revenues. Won/loss records were taken from various years' World Almanacs. Revenue information was taken from the Raiborn study cited above pages 16-21. Finally, the MKT graduation rates were taken from the 1992-1993 NCAA Division I Graduation-Rates Report.

Assuming linearity in the parameters, the applied form of the model is as follows:

$$V_S = a_{11} + a_{11}P_v + b_{11}MKT - b_{21}FINE - b_{31}\,PROB + e_1 \qquad [12]$$

$$V_D = a_{02} - a_{12}P_v - b_{42}PROB - b_{52}\,GRANT + e_2 \qquad [13]$$

$$V_S - V_D = 0 \qquad [14]$$

where V_S is the probability of supplying violations, V_D is the probability of demanding violations, a_{ii} are the coefficients to be estimated for the endogenous variables in each equation, b_{ii} are the coefficients to be estimated for the exogenous variables in each equation, and e_i are random error terms. The expected relationships between the endogenous and exogenous variables are captured by the signs in equations [12] - [14]. It can be shown that this system of three equations is identified.[33] Therefore, parameters of the reduced form equations can be estimated.

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[33] Rank and order conditions, as specified in Judge, et al., (188) pp 623-626, are met.

Due to the simultaneous nature of this system and the nature of the data, Ordinary Least Squares regression analysis may not be the best estimator. Because the data are censored (yearly observations are available for explanatory variables even though schools do not cheat every year) a nonlinear, maximum likelihood estimation technique is required. A simultaneous probit model is used to estimate parameter coefficients. Interpretation of the coefficients on the dependent variables, V_i, must be made with care. The observations on these variables utilize a limited dependent variable of zero (if the school did not experience a penalty) or one (if the school did receive a penalty). Therefore, regression of the independent variables on the limited dependent variables will yield estimates which translate into probabilities.

The empirical model lends itself to several hypothesis tests. The first, and most important, involves the sign and significance of the coefficient on MKT. If the estimate of the coefficient is positive and statistically significant, then the basic premise of this dissertation is supported: market structure affects cheating in the predicted manner. Additionally, sensitivity tests on each of the exogenous variables may reveal the relative importance of each in explaining the variation in violations. For instance, what is the effect of an increase in MKT on cheating? How sensitive is the likelihood of cheating to GRANT or PROB?

Recognizing the dual nature of these estimated parameters, hypothesis tests like these will not only provide insight into the violations market, but also contribute to our understanding of the market for athletes as well. Again, the question we hope to answer is simple: does market structure (in particular, monopsony power) affect cheating? If empirical results suggest it does, then the implications from the violations market will spill over into the market for athletes. This dual nature of the markets for violations and athletes creates many avenues for future research.

CHAPTER V

EMPIRICAL RESULTS AND CONCLUSIONS

Empirical results

The results below summarize two different approaches to the empirical model. First, the simultaneous probit model was used on equations [12] and [13]. Second, a truncated regression technique was used on a hybrid reduced form equation. The first approach affirms our basic premise: monopsony power affects cheating. Additionally, these results confirm the simultaneous nature of the violations and student-athlete markets. The second approach offers a more focused view of the supply of cheating relationships. The two modeling techniques yield slightly different results and provide a point of comparison. A thorough discussion of each follows the tables below.

Results from the simultaneous probit model of equations [12] and [13] are reported in Table 1, below. Of primary interest in Table 1 is the significance of the coefficient on MKT in the V^s equation. A one-tailed t-test allows us to reject the null hypothesis that the coefficient is equal to zero at the 5 percent level. In other words, we reject the hypothesis that MKT has no effect in favor of the alternative that MKT has a positive effect on the

TABLE 1

Dependent Variable:	V_S	V_D
Independent Variable:	Coefficient	
CONSTANT	-0.47 (0.554)	4.34 (-0.009)
PRICE	9.96 (3.135)*	9.89 (3.135)*
MKT	7.14 (2.579)*	***********
FINE	-1.79 (-0.027)	***********
PROB	-100 (-0.004)	-9.70 (-1.066)
GRANT	*********	-1.85 (-2.960)*

Note: Asymptotic t-ratios are reported in parentheses.
Level of significance: * = .05

probability of cheating. This result confirms the central hypothesis of this research: monopsony power (as captured by the graduation rate ratio) affects cheating in the NCAA. An obvious next step in this line of inquiry is to test whether the probabilities of cheating are different for each sport. Linking the differences in probabilities of cheating to the MKT variable could provide additional tools to the enforcement committee of the NCAA.

The coefficient on PRICE is also significant and of the expected sign for V_S. This result confirms the theoretical premise that schools will produce more violations in response to a higher benefit, or rent, obtained per violation. This relationship confirms the simple (but not trivial) direct relation between price and quantity supplied predicted by economic theory. Though the PRICE coefficient is significant for V_D, it is not of the expected sign. This result, though troublesome, does not necessarily invalidate the model. One possible explanation lies within the data. As mentioned, the observations for PRICE are proxies for the unobservable payment for a violation. Perhaps, on the demand side, this proxy is inadequate. S/A MRPs vary across individuals. It could be that actual S/A MRPs are more widely distributed than those utilized in the proxy variable. This could possibly explain the positive sign.

Empirical results for FINE do not support the proposition that punishment deters crime in the NCAA. While the coefficient is of the appropriate sign, (FINE is inversely related to V_S) it is insignificant. This insignificance probably relates to the way that NCAA sanctions are enforced. Generally, it is the athletic program that bears the costs of any sanctions and not the individuals committing the violations.

The coefficient on PROB is of the expected sign in both V_S, and V_D, however both estimates are not significantly different from zero. In this sample the probabilities of getting caught and/or losing eligibility are apparently too small to make a measurable difference. It should be noted that the relatively low probability of being punished could be contributing to the insignificance of the severity of punishment.

Finally, the coefficient on GRANT is negative as expected, but insignificant. The sign suggests (as theory does) that as the value of the basic grant increases, the probable demand for violations decreases. An inverse relationship indicates student-athletes are less likely to demand illegal payments when they are being paid more for their talents as athletes. Taken to the extreme, one might argue that if the market for collegiate athletes were competitive, no cheating would occur at all. If this were the case, hypothetically, as GRANT approached the true value of student-athlete MRPs, V_D should approach zero.

Based on the empirical results from the simultaneous probit model, a market for violations appears to exist and one of its determinants is market structure as defined by monopsony power. The other theorized determinants, however, are not evidenced by this model. This market obviously has a price, as well, to which suppliers and demanders of violations respond. In order to examine the postulated counterpart to this market, all that is necessary is a change of labels. Recall from Chapter III that (in a Marshall-Edgeworth exposition) the supply of violations is equivalent to a demand for quality student-athletes. Likewise, the demand for violations is equivalent to a supply of student-athletes. Thus, the results summarized above can be applied to the intuitive parallel market as well.[34]

Because of the emphasis in the economics of crime literature on the supply of cheating (and the greater interest on the part of enforcers to predict crime), a separate model for a hybrid reduced form equation was estimated using a truncated regression technique. The term hybrid is fitting because it describes the components of the function well. Elements of both the original supply and demand equations estimated above were included in the

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[34] The interpretation of the exogenous variables is straightforward for each market. The endogenously determined prices do not "translate" directly to the market for student-athletes, however. In order to conform with standard neoclassical theory, the signs of the price coefficients must be reversed.

truncated function with interesting results. The results from the truncated regression are summarized in Table 2, below. The truncated regression model is estimated from a subset of the data. In order to focus on the supply of cheating, only the 45 "cheaters" were included in the sample. That is, the observations for which V was equal to 1 were included in the regression. The results in Table 2 are interesting for two reasons: 1) they differ from the simultaneous probit model results and 2) they suggest directions for further research on the supply side of the model.

Once again, the coefficient on the MKT variable is positive and significant indicating that the amount of cheating that one can expect in a cartel is directly related to the market power exercised by the cartel. The PROB coefficient is also negative but insignificant. The probability of getting caught does not have a deterrent effect on cheating in this model. Upon reflection, though, the NCAA enforcement data revealed that many schools are repeat offenders (i.e., have multiple penalties through the years). This might help to explain why PROB was insignificant.

TABLE 2

Dependent Variable:	R^{*s}
Independent Variable:	**Coefficient:**
CONSTANT	4.38 (28.31)*
MKT	0.46 (2.33)*
FINE	-1.49 (-8.59)*
PROB	-0.19 (-1.64)

Level of significance: * = .05

FINE is inversely related to V_S in this formulation. The coefficient is negative and significant at the 5 percent level. This inverse relationship indicates that sanctions are a deterrent.

Conclusions

The empirical evidence supports the main hypothesis that market structure plays a significant role in the decision to cheat on the NCAA cartel agreement. Monopsony power creates economic rents. Schools seek to maximize rents and, in the process, break NCAA rules regarding the recruitment and maintenance of student-athletes. The theoretical model of this dissertation provides the foundation for the model of crime in sports administration. While the neoclassical approach yields a supply and demand framework easily adapted to the economics of crime literature, there are certainly other approaches to the theoretical design of the model. Not the least of these is the agency theory concept addressed in chapter III. Another strategy might eliminate equilibrium analysis altogether and focus on the input demand function itself. Violations could be viewed as simply another input demanded by the school in the production of higher winning percentages. The advantage, however, of the model herein developed is its compatibility with the existing research. The significance of the MKT variable in this model is a key which opens the door to more understanding of cartel behavior.

Since varying degrees of monopsony power affect the amount of cheating within the NCAA, knowledge of the balance of market power within the cartel could lead to increased awareness of potential violators. For example, if a particular program appears to consistently attract top quality S/As by flexing its market power, economic rents to the school should increase. The NCAA's enforcement team could then watch for suspicious activity instead of waiting for reports of recruiting violations. In addition, the model could be adapted to any other monopsonistic industry (health care for example).

Another useful application of the theoretical model is the establishment of the reciprocal nature of supply and demand for violations. One obvious next step in this research agenda is to test the model on the intuitive parallel market: the demand and supply of S/A labor. By introducing the criminal behavior perspective, an alternative approach to traditional labor market analysis could be developed.

Some of the more interesting questions which could be addressed include the following. Given data on the determinants of the reduced form equation, is it possible to predict which schools and/or sports will be more likely to cheat? Because the supply of violations relationship can be translated into a demand for student-athletes, can a market clearing price, or illegal offer, be determined? What are the implications of a change in the degree of monopsony among the various sports? For example, if the professional leagues vertically integrate into the NCAA input markets, will the amount of cheating increase or decrease? Another line of inquiry could explore the effect on antitrust exemption of professional and amateur sports. Should the government reverse its current stance, will the cartel lose power? If so, will NCAA members cheat more or less as cartel power wanes? This dissertation links the economics of crime with cartel theory. The model of crime in sports administration developed herein provides insight into, not only the market for cheating, but potentially also the market for athletes. The dual nature of this model contributes a new perspective on this aspect of cartel theory.

The critical question answered by this research is the following. Does market structure affect cheating in the NCAA? The answer is yes--relative monopsony power helps to explain the cheating that occurs. Thus, this particular aspect of cartel behavior has been explained in a new way.

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APPENDIX

The data employed in the dissertation is provided below.

YR	SC	SP	C	MKT	V	PROB	GRANT	PRICE	FINE
1982	PT	PTB	1	1.064	0	0.0069	22.60	2.4632	-1.3470
1982	OH	OHB	1	0.770	0	0.0139	22.60	2.4632	0.7936
1982	NU	NUB	1	0.173	0	0.0139	22.60	2.4632	0.0000
1982	WI	WIB	1	0.193	1	0.0139	22.60	2.4632	0.0000
1982	IL	ILB	1	0.837	0	0.0139	22.60	2.4632	3.1182
1982	WF	WFB	1	0.977	0	0.0139	22.60	2.4632	0.6236
1982	NR	NRB	1	1.010	0	0.0139	22.60	2.4632	1.1592
1982	CS	CSB	1	0.833	0	0.0139	22.60	2.4632	0.3811
1982	NCS	NCSB	1	0.083	0	0.0069	22.60	2.4632	-0.5800
1982	BC	BCB	1	0.000	0	0.0139	22.60	2.4632	0.8575
1982	IN	INB	1	0.561	0	0.0069	22.60	2.4632	-0.3630
1982	PR	PRB	1	0.379	0	0.0069	22.60	2.4632	1.5244
1982	NC	NCB	1	0.537	0	0.0069	22.60	2.4632	-1.0170
1982	FR	FRB	1	0.000	0	0.0139	22.60	2.4632	0.8575
1982	MR	MRB	1	0.441	0	0.0069	22.60	2.4632	1.0960
1982	OS	OSB	1	0.172	0	0.0139	22.60	2.4632	1.0901
1982	IS	ISB	1	0.600	0	0.0069	22.60	2.4632	1.2473
1982	KU	KUB	1	0.434	0	0.0069	22.60	2.4632	-0.6160
1982	MN	MNB	1	0.614	0	0.0069	22.60	2.4632	-0.3630
1982	V	VB	1	0.761	0	0.0069	22.60	2.4632	-1.3720
1982	MIS	MISB	1	0.985	0	0.0069	22.06	2.4632	-0.3670
1982	D	DB	1	1.010	0	0.0069	22.60	2.4632	-1.3160
1982	IU	IUB	1	0.788	0	0.0069	22.60	2.4632	-0.5710
1982	OU	OUB	1	0.428	0	0.0069	22.60	2.4632	1.0336
1982	MI	MIB	1	0.761	0	0.0139	22.60	2.4632	0.6737
1982	CL	CLB	1	0.617	0	0.0139	22.60	2.4632	0.2807
1982	MF	MFB	1	0.402	0	0.0069	22.60	1.2292	-3.4300
1982	P	PB	1	0.574	0	0.0069	22.60	2.4632	-0.9870
1982	SJ	SJB	1	0.750	0	0.0139	22.60	2.4632	-0.1050
1982	GT	GTB	1	0.476	0	0.0139	22.60	2.4632	1.5327
1982	KS	KSB	1	1.531	0	0.0069	22.60	2.4632	0.0000
1983	OH	OHB	1	0.770	0	0.0343	23.70	3.1209	0.7936
1983	CL	CLB	1	0.617	0	0.0343	23.70	3.1209	0.2807
1983	CS	CSB	1	0.833	0	0.0343	23.70	3.1209	0.3811
1983	OS	OSB	1	0.172	0	0.0343	23.70	3.1209	1.0901
1983	MN	MNB	1	0.614	0	0.0171	23.70	3.1209	-0.3630
1983	OU	OUB	1	0.428	0	0.0343	23.70	3.1209	1.0336
1983	D	DB	1	1.010	0	0.0171	23.70	3.1209	-1.3160
1983	NR	NRB	1	1.010	0	0.0343	23.70	3.1209	1.1592
1983	FR	FRB	1	0.000	0	0.0343	23.70	3.1209	0.8575
1983	PT	PTB	1	1.064	0	0.0171	23.70	3.1209	-1.3470
1983	MIS	MISB	1	0.985	0	0.0171	23.70	3.1209	-0.3670
1983	SJ	SJB	1	0.750	0	0.0171	23.70	3.1209	-0.1050
1983	GT	GTB	1	0.476	0	0.0343	23.70	3.1209	1.5327

1983	NC	NCB	1	0.537	0	0.0171	23.70	3.1209	-1.0170
1983	IL	ILB	1	0.837	0	0.0343	23.70	3.1209	3.1182
1983	WI	WIB	1	0.193	0	0.0171	23.70	3.1209	0.0000
1983	MI	MIB	1	0.761	0	0.0343	23.70	3.1209	0.6737
1983	BC	BCB	1	0.000	0	0.0343	22.60	3.1209	0.8575
1983	IN	INB	1	0.561	0	0.0171	23.70	3.1209	-0.3630
1983	P	PB	1	0.574	0	0.0171	23.70	3.1209	-0.9870
1983	MF	MFB	1	0.402	0	0.0171	23.70	3.1209	-3.4300
1983	NCS	NCSB	1	0.083	0	0.0171	23.70	3.1209	-0.5800
1983	IS	ISB	1	0.600	0	0.0343	22.60	3.1209	1.2473
1983	WF	WFB	1	0.977	0	0.0343	22.60	3.1209	0.6236
1983	IU	IUB	1	0.788	0	0.0171	23.70	3.1209	-0.5710
1983	NU	NUB	1	0.173	0	0.0171	23.70	3.1209	0.0000
1983	KS	KSB	1	1.531	0	0.0171	23.70	3.1209	0.0000
1983	V	VB	1	0.761	0	0.0171	23.70	3.1209	-1.3720
1983	PR	PRB	1	0.379	0	0.0343	22.60	3.1209	1.5244
1983	MR	MRB	1	0.441	0	0.0343	22.60	3.1209	1.0960
1983	KU	KUB	1	0.434	0	0.0171	23.70	3.1209	-0.6160
1984	KU	KUB	1	0.434	0	0.0202	26.66	3.7748	-0.7970
1984	OH	OHB	1	0.770	0	0.0202	26.66	3.7748	-0.2550
1984	FR	FRB	1	0.000	0	0.0202	26.66	3.7748	-1.0130
1984	IU	IUB	1	0.788	0	0.0202	26.66	3.7748	0.0000
1984	OS	OSB	1	0.172	0	0.0404	26.66	3.7748	0.0084
1984	MI	MIB	1	0.761	0	0.0404	26.66	3.7748	0.3938
1984	OU	OUB	1	0.428	0	0.0202	26.66	3.7748	-0.9010
1984	MIS	MISB	1	0.985	0	0.0404	26.66	3.7748	1.4280
1984	D	DB	1	1.010	0	0.0202	26.66	3.7748	-0.0960
1984	IN	INB	1	0.561	1	0.0404	26.66	3.7748	1.8175
1984	P	PB	1	0.574	0	0.0404	26.66	3.7748	0.5648
1984	NC	NCB	1	0.537	0	0.0404	26.66	3.7748	0.9222
1984	PR	PRB	1	0.379	0	0.0202	26.66	3.7748	-3.5670
1984	NCS	NCSB	1	0.083	0	0.0202	26.66	3.7748	-0.0700
1984	CS	CSB	1	0.833	0	0.0202	26.66	3.7748	-0.4540
1984	GT	GTB	1	0.476	0	0.0404	26.66	3.7748	0.9098
1984	PT	PTB	1	0.806	0	0.0202	26.66	3.7748	-0.4540
1984	KS	KSB	1	1.531	0	0.0404	26.66	3.7748	0.6059
1984	SJ	SJB	1	0.750	0	0.0404	26.66	3.7748	0.1657
1984	IS	ISB	1	0.600	0	0.0202	26.66	3.7748	-1.3210
1984	CL	CLB	1	0.617	0	0.0202	26.66	3.7748	-0.1970
1984	MR	MRB	1	0.441	0	0.0202	26.66	3.7748	-1.0920
1984	V	VB	1	0.761	0	0.0202	26.66	3.7748	-0.1250
1984	NR	NRB	1	1.010	0	0.0202	26.66	3.7748	-0.1510
1984	WF	WFB	1	0.977	0	0.0404	26.66	3.7748	2.6436
1984	MF	MFB	1	0.402	0	0.0202	26.66	3.7748	1.2117
1984	BC	BCB	1	0.000	0	0.0202	26.66	3.7748	-0.2560
1984	IL	ILB	1	0.837	0	0.0202	26.66	3.7748	-1.9820
1984	MN	MNB	1	0.614	0	0.0404	26.66	3.7748	1.0386
1984	NU	NUB	1	0.173	0	0.0404	26.66	3.7748	1.7309
1984	WI	WIB	1	0.193	0	0.0404	26.66	3.7748	0.3853
1985	BC	BCB	1	0.000	0	0.0101	33.83	4.4200	-0.2560
1985	OH	OHB	1	0.770	0	0.0101	33.83	4.4200	-0.3070
1985	KU	KUB	1	0.434	0	0.0101	33.83	4.4200	-0.3860

1985	CL	CLB	1	0.617	0	0.0203	33.83	4.4200	0.7000
1985	MF	MFB	1	0.402	0	0.0203	33.83	4.4200	0.6417
1985	WI	WIB	1	0.193	0	0.0101	33.83	4.4200	-0.0810
1985	PR	PRB	1	0.379	0	0.0101	33.83	4.4200	-1.1550
1985	FR	FRB	1	0.000	0	0.0203	33.83	4.4200	0.2962
1985	MI	MIB	1	0.761	0	0.0101	33.83	4.4200	-1.3790
1985	GT	GTB	1	0.476	0	0.0101	33.83	4.4200	-0.4800
1985	MIS	MISB	1	0.985	0	0.0101	33.83	4.4200	-0.2930
1985	V	VB	1	0.761	0	0.0101	33.83	4.4200	-0.9670
1985	P	PB	1	0.574	0	0.0203	33.83	4.4200	0.5839
1985	IS	ISB	1	0.600	0	0.0101	33.83	4.4200	-2.1000
1985	MN	MNB	1	0.614	0	0.0101	33.83	4.4200	-0.2750
1985	IU	IUB	1	0.784	1	0.0101	33.83	4.4200	-1.2830
1985	MR	MRB	1	0.441	0	0.0101	33.83	4.4200	-1.3060
1985	PT	PTB	1	0.806	0	0.0101	33.83	4.4200	-1.5160
1985	OU	OUB	1	0.428	0	0.0101	33.83	4.4200	-0.2370
1985	D	DB	1	1.010	0	0.0203	33.83	4.4200	0.9196
1985	NC	NCB	1	0.537	0	0.0203	33.83	4.4200	0.6783
1985	IL	ILB	1	0.837	0	0.0203	33.83	4.4200	2.1000
1985	NCS	NCSB	1	0.000	0	0.0203	33.83	4.4200	1.2405
1985	SJ	SJB	1	0.000	0	0.0203	33.83	4.4200	0.6417
1985	OS	OSB	1	0.172	0	0.0101	33.83	4.4200	-1.1000
1985	CS	CSB	1	0.833	0	0.0203	33.83	4.4200	1.4437
1985	NR	NRB	1	1.010	0	0.0101	33.83	4.4200	-0.5610
1985	IN	INB	1	0.561	1	0.0203	33.83	4.4200	1.3839
1985	WF	WFB	1	0.977	0	0.0203	33.83	4.4200	0.9333
1985	KS	KSB	1	0.000	0	0.0101	33.83	4.4200	-1.0360
1985	NU	NUB	1	0.000	0	0.0101	33.83	4.4200	0.0000
1986	KS	KSB	1	0.000	0	0.0100	35.70	5.0761	2.0530
1986	BC	BCB	1	0.000	0	0.0100	35.70	5.0761	-0.8610
1986	CL	CLB	1	0.617	0	0.0100	35.70	5.0761	-1.3700
1986	OS	OSB	1	0.172	0	0.0100	35.70	5.0761	1.4751
1986	MN	MNB	1	0.614	0	0.0100	35.70	5.0761	1.4751
1986	OU	OUB	1	0.428	0	0.0100	35.70	5.0761	0.4958
1986	CS	CSB	1	0.333	0	0.0100	35.70	5.0761	-0.1390
1986	NR	NRB	1	1.010	0	0.0100	35.70	5.0761	1.0357
1986	D	DB	1	1.010	0	0.0100	35.70	5.0761	-1.0590
1986	PT	PTB	1	1.080	0	0.0100	35.70	5.0761	1.1775
1986	MIS	MISB	1	0.985	0	0.0333	35.70	5.0761	-3.8460
1986	SJ	SJB	1	0.000	0	0.0100	35.70	5.0761	0.2463
1986	FR	FRB	1	0.000	0	0.0201	35.70	5.0761	1.8840
1986	NC	NCB	1	0.537	0	0.0333	35.70	5.0761	-0.6560
1986	GT	GTB	1	0.476	0	0.0201	35.70	5.0761	0.3200
1986	WI	WIB	1	0.193	1	0.0333	35.70	5.0761	-1.2130
1986	MI	MIB	1	0.761	0	0.0100	35.70	5.0761	1.7662
1986	OH	OHB	1	0.770	0	0.0333	35.70	5.0761	-0.4210
1986	IL	ILB	1	1.175	0	0.0201	35.70	5.0761	1.9268
1986	P	PB	1	0.574	0	0.0100	35.70	5.0761	0.5676
1986	MF	MFB	1	0.402	0	0.0100	35.70	5.0761	0.7850
1986	NCS	NCSB	1	0.000	0	0.0333	35.70	5.0761	-1.4650
1986	IN	INB	1	0.561	1	0.0100	35.70	5.0761	-1.2840
1986	WF	WFB	1	0.977	0	0.0333	35.70	5.0761	-1.1410

1986	IS	ISB	1	0.600	0	0.0201	35.70	5.0761	3.4254
1986	NU	NUB	1	0.000	0	0.0333	35.70	5.0761	-1.9430
1986	IU	IUB	1	1.035	0	0.0201	35.70	5.0761	2.3550
1986	V	VB	1	0.761	0	0.0100	35.70	5.0761	1.8690
1986	PR	PRB	1	0.379	0	0.0100	35.70	5.0761	2.1980
1986	MR	MRB	1	0.441	0	0.0333	35.70	5.0761	-0.3360
1986	KU	KUB	1	0.434	0	0.0100	35.70	5.0761	0.9356
1987	BC	BCB	1	0.000	0	0.0033	37.56	5.7322	0.3307
1987	PT	PTB	1	1.080	0	0.0033	37.56	5.7322	0.8125
1987	NU	NUB	1	0.186	0	0.0033	37.56	5.7322	0.8254
1987	CS	CSB	1	0.333	0	0.0033	37.56	5.7322	0.2783
1987	OU	OUB	1	0.457	0	0.0333	37.56	5.7322	-0.2450
1987	IN	INB	1	0.808	0	0.0333	37.56	5.7322	-1.7720
1987	WF	WFB	1	1.000	0	0.0333	37.56	5.7322	-3.5450
1987	CL	CLB	1	1.148	0	0.0033	37.56	5.7322	1.5758
1987	SJ	SJB	1	0.781	0	0.0333	37.56	5.7322	-2.0550
1987	D	DB	1	1.010	0	0.0033	37.56	5.7322	0.6472
1987	MN	MNB	1	0.885	0	0.0033	37.56	5.7322	0.7500
1987	NCS	NCSB	1	0.097	0	0.0033	37.56	5.7322	0.7222
1987	MIS	MISB	1	1.147	0	0.0033	37.56	5.7322	4.0625
1987	FR	FRB	1	0.000	0	0.0333	37.56	5.7322	-1.9860
1987	OS	OSB	1	0.551	0	0.0333	37.56	5.7322	-2.5000
1987	NC	NCB	1	1.075	0	0.0333	37.56	5.7322	-1.5120
1987	IS	ISB	1	0.833	0	0.0033	37.56	5.7322	2.3636
1987	IL	ILB	1	1.175	0	0.0333	37.56	5.7322	-3.8000
1987	MI	MIB	1	0.727	0	0.0333	37.56	5.7322	-0.8120
1987	V	VB	1	0.880	0	0.0033	37.56	5.7322	0.2063
1987	IU	IUB	1	1.035	0	0.0033	37.56	5.7322	1.0833
1987	PR	PRB	1	0.988	0	0.0033	37.56	5.7322	2.7957
1987	MF	MFB	1	0.695	0	0.0333	37.56	3.0782	-3.2500
1987	GT	GTB	1	0.928	0	0.0333	37.56	5.7322	-0.3470
1987	KS	KSB	1	1.428	0	0.0333	37.56	5.7322	-1.3780
1987	P	PB	1	0.689	0	0.0333	37.56	5.7322	-1.3460
1987	NR	NRB	1	0.888	0	0.0333	37.56	5.7322	-1.3480
1987	OH	OHB	1	1.149	0	0.0333	37.56	5.7322	-0.8940
1987	WI	WIB	1	0.329	1	0.0333	37.56	5.7322	-2.6590
1987	MR	MRB	1	0.813	0	0.0333	37.56	5.7322	-0.2090
1987	KU	KUB	1	0.723	0	0.0333	37.56	5.7322	-0.7010
1988	D	DB	1	1.010	0	0.0333	38.70	6.3899	-2.5650
1988	NR	NRB	1	0.888	0	0.0333	38.70	6.3899	-0.1620
1988	SJ	SJB	1	0.781	0	0.0196	38.70	6.3899	1.4725
1988	IN	INB	1	0.808	1	0.0333	38.70	6.3899	-1.2520
1988	MR	MRB	1	0.813	0	0.0333	38.70	6.3899	-2.2380
1988	KU	KUB	1	0.723	0	0.0196	38.70	6.3899	1.7179
1988	OS	OSB	1	0.551	0	0.0196	38.70	6.3899	1.5558
1988	KS	KSB	1	1.428	0	0.0196	38.70	6.3899	1.4615
1988	IL	ILB	1	1.175	0	0.0333	38.70	6.3899	-3.7580
1988	NCS	NCSB	1	0.097	0	0.0196	38.70	6.3899	0.1253
1988	MI	MIB	1	0.727	0	0.0196	38.70	6.3899	0.0000
1988	WF	WFB	1	1.000	0	0.0196	38.70	6.3899	5.4285
1988	PR	PRB	1	0.988	0	0.0333	38.70	6.3899	-2.4530
1988	GT	GTF	1	0.946	0	0.0196	38.70	3.4519	0.6177

1988	CL	CLB	1	1.148	0	0.0196	38.70	6.3899	1.7563
1988	CS	CSB	1	0.333	0	0.0196	38.70	6.3899	1.0762
1988	WI	WIB	1	0.329	1	0.0196	38.70	6.3899	0.3132
1988	OU	OUB	1	0.457	0	0.0196	38.70	6.3899	0.0600
1988	IS	ISB	1	0.833	0	0.0196	38.70	6.3899	1.6703
1988	V	VB	1	0.88	0	0.0333	38.70	6.3899	-0.5250
1988	MN	MNB	1	0.885	1	0.0333	38.70	6.3899	-4.9210
1988	P	PB	1	0.689	0	0.0333	38.70	6.3899	-0.2220
1988	MIS	MISB	1	1.147	0	0.0333	38.70	6.3899	-0.8610
1988	IU	IUB	1	1.035	0	0.0333	38.70	6.3899	-3.4450
1988	NU	NUB	1	0.186	0	0.0333	38.70	6.3899	-0.4920
1988	FR	FRB	1	0.000	0	0.0333	38.70	6.3899	-0.3170
1988	PT	PTB	1	1.080	0	0.0196	38.70	6.3899	0.8612
1988	BC	BCB	1	0.000	0	0.0196	38.70	6.3899	0.0547
1988	NC	NCB	1	1.075	0	0.0333	38.70	6.3899	-3.2310
1988	MF	MFB	1	0.695	0	0.0333	38.70	3.4519	-2.2960
1988	OH	OHB	1	1.149	0	0.0196	38.70	6.3899	0.6600
1989	BC	BCB	1	0.000	0	0.0066	41.60	7.0439	1.4121
1989	IN	INB	1	0.808	1	0.0066	41.60	7.0439	3.1614
1989	D	DB	1	1.010	0	0.0333	41.60	7.0439	-2.5990
1989	GT	GTB	1	0.928	0	0.0333	41.60	7.0439	-1.8420
1989	V	VB	1	0.880	0	0.0333	41.60	7.0439	-0.7210
1989	OH	OHB	1	1.149	0	0.0066	41.60	7.0439	0.6897
1989	CL	CLB	1	1.148	0	0.0066	41.60	7.0439	0.0000
1989	IU	IUB	1	1.035	0	0.0066	41.60	7.0439	2.3183
1989	P	PB	1	0.689	0	0.0066	41.60	7.0439	0.0612
1989	MF	MFB	1	0.695	0	0.0066	41.60	3.8219	10.4320
1989	KU	KUB	1	0.723	0	0.0066	41.60	7.0439	0.6641
1989	IL	ILB	1	1.175	0	0.0066	41.60	7.0439	1.2645
1989	KS	KSB	1	1.428	0	0.0333	41.60	7.0439	-5.1710
1989	IS	ISB	1	0.833	0	0.0066	41.60	7.0439	0.0000
1989	SJ	SJB	1	0.781	0	0.0333	41.60	7.0439	-1.5160
1989	OU	OUB	1	0.457	0	0.0066	41.60	7.0439	0.4272
1989	CS	CSB	1	0.333	0	0.0333	41.60	7.0439	-0.0660
1989	NR	NRB	1	0.888	0	0.0066	41.60	7.0439	2.9456
1989	FR	FRB	1	0.000	0	0.0066	41.60	7.0439	4.6900
1989	MR	MRB	1	0.813	0	0.0066	41.60	7.0439	0.4968
1989	PR	PRB	1	0.988	0	0.0333	41.60	7.0439	-2.6670
1989	WF	WFB	1	1.000	0	0.0333	41.60	7.0439	-0.4210
1989	NU	NUB	1	0.186	0	0.0066	41.60	7.0439	0.0000
1989	MI	MIBB	1	0.727	0	0.0333	41.60	7.0439	-1.3660
1989	NC	NCB	1	1.075	0	0.0066	41.60	7.0439	3.6303
1989	WI	WIB	1	0.329	0	0.0333	41.60	7.0439	-2.5290
1989	MIS	MISB	1	1.147	0	0.0066	41.60	7.0439	2.7323
1989	NCS	NCSB	1	0.097	0	0.0066	41.60	7.0439	0.3980
1989	OS	OSB	1	0.551	0	0.0333	41.60	7.0439	-0.5760
1989	MN	MNB	1	0.885	0	0.0333	41.60	7.0439	-0.4960
1989	PT	PTB	1	1.080	0	0.0333	41.60	7.0439	-4.7000
1990	SJ	SJB	1	0.781	0	0.0333	53.00	7.6803	-1.7160
1990	WF	WFB	1	1.000	0	0.0166	53.00	7.6803	2.8955
1990	D	DB	1	1.010	0	0.0166	53.00	7.6803	3.5705
1990	MR	MRB	1	0.813	1	0.0166	53.00	7.6803	3.6750

1990	NR	NRB	1	0.888	0	0.0333	53.00	7.6803	-0.8710
1990	NC	NCB	1	1.075	0	0.0333	53.00	7.6803	-4.5690
1990	CS	CSB	1	0.333	0	0.0333	53.00	7.6803	-2.6250
1990	PT	PTB	1	1.080	0	0.0166	53.00	7.6803	1.5750
1990	P	PB	1	0.689	0	0.0166	53.00	7.6803	0.2439
1990	MN	MNB	1	0.885	0	0.0166	53.00	7.6803	2.6250
1990	NU	NUB	1	0.186	0	0.0166	53.00	7.6803	1.0500
1990	NCS	NCSB	1	0.097	0	0.0333	53.00	7.6803	-1.6560
1990	MF	MFB	1	0.695	0	0.0333	53.00	4.1743	-7.3500
1990	PR	PRB	1	0.988	0	0.0166	53.00	7.6803	1.1861
1990	WI	WIB	1	0.329	0	0.0166	53.00	7.6803	1.3364
1990	IS	ISB	1	0.833	0	0.0333	53.00	7.6803	-3.1180
1990	IU	IUB	1	1.035	0	0.0166	53.00	7.6803	1.2250
1990	OS	OSB	1	0.551	0	0.0333	53.00	7.6803	-0.3000
1990	CL	CLB	1	1.148	0	0.0333	53.00	7.6803	-1.1730
1990	IL	ILB	1	1.175	0	0.0333	53.00	7.6803	-4.0090
1990	OU	OUB	1	0.457	0	0.0166	53.00	7.6803	0.9498
1990	V	VB	1	0.880	0	0.0333	53.00	7.6803	-4.3550
1990	KS	KSB	1	1.428	0	0.0333	53.00	7.6803	-0.1020
1990	MIS	MISB	1	1.147	0	0.0333	53.00	7.6803	-1.5750
1990	KU	KUB	1	0.723	0	0.0333	53.00	7.6803	-0.0640
1990	GT	GTB	1	0.928	0	0.0166	53.00	7.6803	0.8588
1990	OH	OHB	1	1.149	0	0.0333	53.00	7.6803	-3.1700
1990	IN	INB	1	0.808	0	0.0166	53.00	7.6803	4.9000
1990	FR	FRB	1	0.000	1	0.0333	53.00	7.6803	-1.8390
1990	MI	MIB	1	0.727	0	0.0166	53.00	7.6803	0.9333
1990	BC	BCB	1	0.000	0	0.0166	53.00	7.6803	0.8300
1991	BC	BCB	1	0.000	0	0.0333	58.50	8.3289	-0.9360
1991	V	VB	1	0.880	0	0.0266	58.50	8.3289	1.4637
1991	NC	NCB	1	1.075	0	0.0266	58.50	8.3289	4.1401
1991	PR	PRB	1	0.988	0	0.0266	58.50	8.3289	3.7562
1991	CL	CLB	1	1.148	0	0.0333	58.50	8.3289	-0.9130
1991	NU	NUB	1	0.186	0	0.0266	58.50	8.3289	0.0000
1991	OU	OUB	1	0.457	0	0.0333	58.50	8.3289	-0.2660
1991	KS	KSB	1	1.428	1	0.0266	58.50	8.3289	3.0885
1991	CS	CSB	1	0.333	0	0.0266	58.50	8.3289	1.2209
1991	NR	NRB	1	0.888	0	0.0333	58.50	8.3289	-2.0490
1991	D	DB	1	1.010	0	0.0266	58.50	8.3289	0.9200
1991	WF	WFB	1	1.000	0	0.0333	58.50	7.1289	-2.4260
1991	P	PB	1	0.689	1	0.0333	58.50	8.3289	-2.2500
1991	MR	MRB	1	0.813	1	0.0266	58.50	8.3289	1.5600
1991	MI	MIB	1	0.727	0	0.0333	58.50	8.3289	-4.0440
1991	FR	FRB	1	0.000	0	0.0333	58.50	8.3289	-1.2450
1991	SJ	SJB	1	0.781	0	0.0266	58.50	8.3289	0.9394
1991	MN	MNB	1	0.885	1	0.0266	58.50	8.3289	4.4100
1991	IN	INB	1	0.808	0	0.0333	58.50	8.3289	-2.4260
1991	MIS	MISB	1	1.147	0	0.0266	58.50	8.3289	0.0000
1991	MF	MFB	1	0.695	0	0.0333	58.50	4.5389	-1.2130
1991	IL	ILB	1	1.175	0	0.0266	58.50	8.3289	13.3460
1991	OH	OHB	1	1.149	0	0.0333	58.50	8.3289	-2.3000
1991	WI	WIB	1	0.329	0	0.0333	58.50	7.1289	-1.3230
1991	IS	ISB	1	0.833	0	0.0266	58.50	8.3289	0.6618

1991	GT	GTB	1	0.928	0	0.0266	58.50	8.3289	0.7882
1991	KU	KUB	1	0.723	0	0.0333	58.50	8.3289	-0.8080
1991	IU	IUB	1	1.035	0	0.0333	58.50	8.3289	-0.4460
1991	NCS	NCSB	1	0.097	0	0.0266	58.50	8.3289	1.1776
1991	PT	PTB	1	1.080	0	0.0333	58.50	8.3289	-1.4050
1991	OS	OSB	1	0.551	0	0.0266	58.50	8.3289	0.3300
1982	PR	PRF	2	0.540	0	0.0069	6.78	1.2292	-1.8700
1982	MN	MNF	2	0.600	0	0.0069	6.78	1.2292	-1.8700
1982	OU	OUF	2	0.800	0	0.0139	6.78	1.2292	-1.7150
1982	MR	MRF	2	0.581	0	0.0069	6.78	1.2292	-1.8700
1982	IU	IUF	2	0.682	0	0.0069	6.78	1.2292	-1.7760
1982	KS	KSF	2	0.628	0	0.0139	6.78	1.2292	-2.7940
1982	V	VF	2	1.075	0	0.0139	6.78	1.2292	-0.1550
1982	PT	PTF	2	0.612	0	0.0069	6.78	1.2292	-0.6430
1982	MI	MIF	2	0.545	0	0.0069	6.78	2.3982	0.5947
1982	NCS	NCSF	2	0.752	0	0.0139	6.78	1.2292	1.0797
1982	NC	NCF	2	0.402	0	0.0069	6.78	1.2292	-1.3010
1982	CS	CSF	2	0.600	0	0.0139	6.78	1.2292	2.8425
1982	FR	FRF	2	0.666	0	0.0139	6.78	1.2292	0.2602
1982	IL	ILF	2	0.887	0	0.0069	6.78	1.2292	0.6125
1982	OS	OSF	2	0.534	0	0.0069	6.78	1.2292	0.0000
1982	SJ	SJF	2	0.781	0	0.0069	6.78	1.2292	0.0000
1982	NU	NUF	2	0.400	0	0.0139	6.78	1.2292	1.8709
1982	GT	GTF	2	0.806	0	0.0139	6.78	1.2292	0.0200
1982	IN	INF	2	0.808	0	0.0139	6.78	1.2292	-1.5920
1982	KU	KUF	2	0.565	0	0.0069	6.78	1.2292	2.2867
1982	WF	WFF	2	0.806	0	0.0069	6.78	1.2292	1.1757
1982	IS	ISF	2	0.555	0	0.0069	6.78	1.2292	0.2541
1982	MIS	MISF	2	0.852	0	0.0069	6.78	1.2292	-2.3120
1982	MF	MF	2	0.682	0	0.0069	6.78	1.2292	-0.9860
1982	CL	CLF	2	0.333	1	0.0069	6.78	1.2292	-0.9950
1982	WI	WIF	2	0.969	1	0.0069	6.78	1.2292	-0.6230
1982	OH	OHF	2	0.724	0	0.0069	6.78	1.2292	1.7150
1982	P	PF	2	1.149	0	0.0069	6.78	1.2292	0.5717
1982	NR	NRF	2	0.757	0	0.0139	6.78	1.2292	1.2473
1982	D	DF	2	0.848	0	0.0069	6.78	1.2292	-1.3460
1982	BC	BCF	2	0.852	0	0.0139	6.78	1.2292	1.4500
1983	SJ	SJF	2	0.781	0	0.0171	7.11	1.6029	0.0000
1983	P	PF	2	1.149	0	0.0343	7.11	1.6029	0.5717
1983	GT	GTF	2	0.806	1	0.0343	7.11	1.6029	0.0245
1983	OH	OHF	2	0.724	0	0.0343	7.11	1.6029	1.7150
1983	WF	WFF	2	0.806	0	0.0343	7.11	1.6029	1.1757
1983	KS	KSF	2	0.628	0	0.0171	7.11	1.6029	-2.7940
1983	MIS	MISF	2	0.852	0	0.0171	7.11	1.6029	-2.3120
1983	NC	NCF	2	0.402	0	0.0171	7.11	1.6029	-1.3010
1983	NR	NRF	2	0.757	0	0.0343	7.11	1.6029	1.2473
1983	IS	ISF	2	0.555	0	0.0343	7.11	1.6029	0.2541
1983	FR	FRF	2	0.378	1	0.0343	7.11	1.6029	3.1702
1983	IN	INF	2	0.808	0	0.0171	7.11	1.6029	-1.5920
1983	D	DF	2	0.848	0	0.0171	7.11	1.6029	-1.3460
1983	V	VF	2	1.075	0	0.0171	7.11	1.6029	-0.1550
1983	OU	OUF	2	0.800	0	0.0171	7.11	1.6029	-1.7150

1983	PR	PRF	2	0.540	0	0.0171	7.11	1.6029	-1.8700
1983	CS	CSF	2	0.600	0	0.0343	7.11	1.6029	2.8425
1983	BC	BCF	2	0.852	0	0.0343	7.11	1.6029	1.4500
1983	MR	MRF	2	0.581	0	0.0171	7.11	1.6029	-1.8700
1983	IU	IUF	2	0.682	0	0.0171	7.11	1.6029	-1.7760
1983	MN	MNF	2	0.600	0	0.0171	7.11	1.6029	-1.8700
1983	PT	PTF	2	0.612	0	0.0171	7.11	1.6029	-0.6430
1983	CL	CLF	2	0.333	1	0.0171	7.11	1.6029	-0.9950
1983	MI	MIF	2	0.545	0	0.0343	7.11	1.6029	0.5947
1983	OS	OSF	2	0.534	0	0.0171	7.11	1.6029	0.0000
1983	KU	KUF	2	0.565	0	0.0343	7.11	1.6029	2.2867
1983	NU	NUF	2	0.400	1	0.0343	7.11	1.6029	1.8709
1983	NCS	NCSF	2	0.752	0	0.0343	7.11	1.6029	1.0797
1983	MF	MF	2	0.682	1	0.0171	7.11	3.1209	-0.9860
1983	IL	ILF	2	0.887	0	0.0343	7.11	1.6029	0.6125
1983	WI	WIF	2	0.969	1	0.0171	7.11	1.6029	-0.6230
1984	IS	ISF	2	0.555	0	0.0404	8.00	1.9728	0.6828
1984	MR	MRF	2	0.581	0	0.0202	8.00	1.9728	-1.3210
1984	NC	NCF	2	0.402	0	0.0404	8.00	1.9728	2.0387
1984	CL	CLF	2	0.333	1	0.0202	8.00	1.9728	-1.0000
1984	NCS	NCSF	2	0.752	0	0.0202	8.00	1.9728	-1.1140
1984	D	DF	2	0.848	0	0.0404	8.00	1.9728	0.1635
1984	NR	NRF	2	0.757	0	0.0202	8.00	1.9728	-1.9820
1984	GT	GTF	2	0.806	0	0.0202	8.00	1.9728	-0.0820
1984	NU	NUF	2	0.400	1	0.0202	8.00	1.9728	-0.6600
1984	IN	INF	2	0.808	0	0.0404	8.00	1.9728	2.4466
1984	OH	OHF	2	0.724	0	0.0202	8.00	1.9728	0.0000
1984	KS	KSF	2	0.628	0	0.0404	8.00	1.9728	2.1541
1984	OS	OSF	2	0.534	0	0.0202	8.00	1.9728	0.0000
1984	MF	MF	2	0.682	0	0.0404	8.00	3.7748	0.2908
1984	OU	OUF	2	0.800	0	0.0404	8.00	1.9728	2.4233
1984	MIS	MISF	2	0.852	0	0.0404	8.00	1.9728	1.7406
1984	P	PF	2	1.149	0	0.0202	8.00	1.9728	0.0000
1984	BC	BCF	2	0.852	0	0.0404	8.00	1.9728	0.6058
1984	PR	PRF	2	0.540	0	0.0404	8.00	1.9728	0.4957
1984	FR	FRF	2	0.666	1	0.0202	8.00	1.9728	-1.6960
1984	PT	PTF	2	0.612	0	0.0404	8.00	1.9728	1.1700
1984	IU	IUF	2	0.682	0	0.0404	8.00	1.9728	1.3631
1984	SJ	SJF	2	0.781	0	0.0202	8.00	1.9728	-0.1860
1984	MI	MIF	2	0.545	0	0.0202	8.00	1.9728	-0.0680
1984	V	VF	2	1.075	0	0.0202	8.00	1.9728	-1.9820
1984	CS	CSF	2	0.600	0	0.0404	8.00	1.9728	1.3631
1984	WF	WFF	2	0.806	0	0.0202	8.00	1.9728	-1.4430
1984	KU	KUF	2	0.565	0	0.0202	8.00	1.9728	-1.2110
1984	IL	ILF	2	0.887	0	0.0202	8.00	1.9728	-3.4530
1984	MN	MNF	2	0.600	0	0.0404	8.00	1.9728	1.3218
1984	WI	WIF	2	0.969	1	0.0404	8.00	1.9728	0.6609
1985	PT	PTF	2	0.612	0	0.0203	10.15	2.3340	0.4813
1985	WI	WIF	2	0.969	0	0.0203	10.15	2.3340	1.4000
1985	NU	NUF	2	0.400	0	0.0101	10.15	2.3340	-1.1000
1985	GT	GTF	2	0.806	0	0.0101	10.15	2.3340	-2.0310
1985	P	PF	2	1.149	0	0.0101	10.15	2.3340	0.0000

1985	BC	BCF	2	0.852	0	0.0101	10.15	2.3340	-1.4850
1985	PR	PRF	2	0.540	0	0.0203	10.15	2.3340	0.8750
1985	NCS	NCSF	2	0.752	0	0.0203	10.15	2.3340	1.1000
1985	SJ	SJF	2	0.781	0	0.0203	10.15	2.3340	0.2852
1985	CS	CSF	2	0.600	0	0.0101	10.15	2.3340	-1.4110
1985	MIS	MISF	2	0.852	0	0.0203	10.15	2.3340	0.8250
1985	NC	NCF	2	0.402	0	0.0101	10.15	2.3340	-0.2750
1985	IL	ILF	2	0.887	0	0.0101	10.15	2.3340	-0.4080
1985	MR	MRF	2	0.581	0	0.0101	10.15	2.3340	-0.8250
1985	IN	INF	2	0.808	0	0.0101	10.15	2.3340	-0.4730
1985	OU	OUF	2	0.657	0	0.0203	10.15	2.3340	1.2833
1985	MI	MIF	2	0.545	0	0.0101	10.15	2.3340	-1.7810
1985	FR	FRF	2	0.666	0	0.0203	10.15	2.3340	0.8823
1985	IS	ISF	2	0.555	0	0.0203	10.15	2.3340	0.6733
1985	NR	NRF	2	0.757	0	0.0101	10.15	2.3340	0.0000
1985	MF	MF	2	0.682	0	0.0101	10.15	2.3340	-0.0780
1985	OH	OHF	2	0.724	0	0.0101	10.15	2.3340	-1.2830
1985	V	VF	2	1.075	0	0.0203	10.15	2.3340	0.7000
1985	D	DF	2	0.848	0	0.0203	10.15	2.3340	2.5750
1985	WF	WFF	2	0.806	0	0.0101	10.15	2.3340	-0.6230
1985	IU	IUF	2	0.682	0	0.0203	10.15	2.3340	2.0000
1985	KU	KUF	2	0.565	0	0.0101	10.15	2.3340	-1.9250
1985	OS	OSF	2	0.534	0	0.0101	10.15	2.3340	0.0000
1985	CL	CLF	2	0.333	0	0.0203	10.15	2.3340	1.1177
1985	MN	MNF	2	0.600	0	0.0203	10.15	2.3340	1.0500
1985	KS	KSF	2	0.628	0	0.0203	10.15	2.3340	0.6663
1986	OH	OHF	2	0.724	0	0.0333	10.71	2.7061	-0.7850
1986	FR	FRF	2	0.666	0	0.0100	10.71	2.7061	-0.3810
1986	PT	PTF	2	0.612	0	0.0333	10.71	2.7061	-0.6240
1986	KU	KUF	2	0.565	0	0.0100	10.71	2.7061	4.7100
1986	MR	MRF	2	0.581	0	0.0100	10.71	2.7061	2.0695
1986	BC	BCF	2	0.852	0	0.0100	10.71	2.7061	-4.7100
1986	MN	MNF	2	0.600	0	0.0100	10.71	2.7061	0.7850
1986	CL	CLF	2	0.333	0	0.0201	10.71	2.7061	0.8722
1986	SJ	SJF	2	0.781	0	0.0100	10.71	2.7061	0.5483
1986	OU	OUF	2	0.657	0	0.0333	10.71	2.7061	-1.5700
1986	GT	GTF	2	0.806	0	0.0100	10.71	2.7061	-1.0090
1986	NCS	NCSF	2	0.752	0	0.0333	10.71	2.7061	-1.6240
1986	MIS	MISF	2	0.852	0	0.0100	10.71	2.7061	2.2773
1986	NC	NCF	2	0.402	0	0.0333	10.71	2.7061	-0.6000
1986	V	VF	2	1.075	0	0.0333	10.71	2.7061	-3.4250
1986	PR	PRF	2	0.540	0	0.0100	10.71	2.7061	0.4995
1986	IL	ILF	2	0.887	0	0.0100	10.71	2.7061	0.0000
1986	IU	IUF	2	0.847	0	0.0100	10.71	2.7061	0.9028
1986	IN	INF	2	0.808	0	0.0201	10.71	2.7061	0.9420
1986	OS	OSF	2	0.534	0	0.0100	10.71	2.7061	0.0000
1986	WF	WFF	2	0.806	0	0.0100	10.71	2.7061	0.8971
1986	CS	CSF	2	0.600	0	0.0100	10.71	2.7061	-0.1040
1986	MI	MIF	2	0.545	0	0.0100	10.71	2.7061	0.2748
1986	D	DF	2	0.848	0	0.0201	10.71	2.7061	0.4758
1986	IS	ISF	2	0.555	0	0.0201	10.71	2.7061	0.6209
1986	NU	NUF	2	0.400	0	0.0100	10.71	2.7061	0.8563

1986	WI	WIF	2	0.969	0	0.0333	10.71	2.7061	-1.7120
1986	P	PF	2	1.149	0	0.0100	10.71	2.7061	0.7850
1986	NR	NRF	2	0.757	0	0.0100	10.71	2.7061	0.0000
1986	KS	KSF	2	0.628	0	0.0100	10.71	2.7061	1.8441
1986	MF	MF	2	0.682	0	0.0333	10.71	5.0761	-0.9000
1987	GT	GTF	2	0.946	0	0.0033	11.27	3.0782	2.0472
1987	BC	BCF	2	0.989	0	0.0033	11.27	3.0782	5.1212
1987	MN	MNF	2	0.671	0	0.0033	11.27	3.0782	0.4924
1987	NU	NUF	2	0.560	0	0.0033	11.27	3.0782	1.1818
1987	OU	OUF	2	0.657	0	0.0333	11.27	3.0782	-2.1660
1987	CL	CLF	2	0.716	0	0.0333	11.27	3.0782	-0.5740
1987	IL	ILF	2	1.000	0	0.0033	11.27	3.0782	6.7500
1987	NR	NRF	2	0.888	0	0.0033	11.27	3.0782	5.9091
1987	SJ	SJF	2	1.468	0	0.0333	11.27	3.0782	-1.2200
1987	WF	WFF	2	0.897	0	0.0033	11.27	3.0782	1.0400
1987	MIS	MISF	2	1.136	0	0.0333	11.27	3.0782	-0.1770
1987	D	DF	2	0.939	0	0.0033	11.27	3.0782	2.1242
1987	IN	INF	2	0.775	0	0.0333	11.27	3.0782	-0.8120
1987	NC	NCF	2	0.666	0	0.0333	11.27	3.0782	-1.3220
1987	MI	MIF	2	0.852	0	0.0033	11.27	3.0782	0.4875
1987	MR	MRF	2	0.651	0	0.0333	11.27	3.0782	-0.4920
1987	P	PF	2	1.022	0	0.0033	11.27	3.0782	2.1660
1987	KS	KSF	2	1.514	0	0.0333	11.27	3.0782	-0.6870
1987	IS	ISF	2	0.477	0	0.0033	11.27	3.0782	0.6373
1987	WI	WIF	2	1.169	0	0.0033	11.27	3.0782	1.1818
1987	PT	PTF	2	0.822	0	0.0033	11.27	3.0782	0.2258
1987	NCS	NCSF	2	0.795	0	0.0033	11.27	3.0782	1.0412
1987	MF	MF	2	0.548	0	0.0033	11.27	5.7322	1.7300
1987	FR	FRF	2	0.500	0	0.0333	11.27	3.0782	-3.1290
1987	IU	IUF	2	0.847	0	0.0333	11.27	3.0782	-5.5790
1987	OH	OHF	2	0.873	0	0.0033	11.27	3.0782	1.0833
1987	KU	KUF	2	0.723	0	0.0333	11.27	3.0782	-5.4160
1987	OS	OSF	2	0.672	0	0.0033	11.27	3.0782	0.0000
1987	CS	CSF	2	0.600	0	0.0333	11.27	3.0782	-0.7220
1987	V	VF	2	1.075	0	0.0033	11.27	3.0782	8.2727
1987	PR	PRF	2	0.563	0	0.0333	11.27	3.0782	-0.6890
1988	NC	NCF	2	0.666	0	0.0333	11.61	3.4519	-0.2080
1988	MF	MF	2	0.548	0	0.0333	11.61	3.4519	-3.3490
1988	OU	OUF	2	0.657	0	0.0196	11.61	3.4519	4.5933
1988	KS	KSF	2	1.514	0	0.0196	11.61	3.4519	0.3175
1988	MN	MNF	2	0.671	1	0.0196	11.61	3.4519	2.8186
1988	PR	PRF	2	0.563	0	0.0196	11.61	3.4519	0.0000
1988	NR	NRF	2	0.888	0	0.0333	11.61	3.4519	-5.0100
1988	FR	FRF	2	0.500	0	0.0333	11.61	3.4519	-2.6130
1988	IS	ISF	2	0.477	0	0.0333	11.61	3.4519	-2.7880
1988	NCS	NCSF	2	0.795	0	0.0196	11.61	3.4519	0.9307
1988	CL	CLF	2	0.716	0	0.0196	11.61	3.4519	3.9266
1988	P	PF	2	1.022	0	0.0196	11.61	3.4519	0.0000
1988	WF	WFF	2	0.897	0	0.0333	11.61	3.4519	-2.7560
1988	MR	MRF	2	0.651	0	0.0196	11.61	3.4519	0.0000
1988	OS	OSF	2	0.672	0	0.0333	11.61	3.4519	-2.8180
1988	GT	GTF	2	0.928	0	0.0196	11.61	3.4519	1.6928

1988	MI	MIF	2	0.852	0	0.0196	11.61	3.4519	1.4591
1988	OH	OHF	2	0.873	0	0.0196	11.61	3.4519	0.0000
1988	IL	ILF	2	1.000	0	0.0333	11.61	3.4519	-3.4450
1988	D	DF	2	0.939	0	0.0333	11.61	3.4519	-2.8640
1988	NU	NUF	2	0.560	0	0.0333	11.61	3.4519	-2.5050
1988	SJ	SJF	2	1.468	0	0.0196	11.61	3.4519	3.2862
1988	WI	WIF	2	1.169	0	0.0196	11.61	3.4519	2.5054
1988	CS	CSF	2	0.600	0	0.0196	11.61	3.4519	1.1879
1988	MIS	MISF	2	1.136	0	0.0333	11.61	3.4519	-3.2700
1988	PT	PTF	2	0.822	0	0.0196	11.61	3.4519	2.0320
1988	IN	INF	2	0.775	0	0.0196	11.61	3.4519	0.0000
1988	IU	IUF	2	0.847	0	0.0196	11.61	3.4519	5.9139
1988	KU	KUF	2	0.723	1	0.0333	11.61	3.4519	-2.2960
1988	V	VF	2	1.075	0	0.0196	11.61	3.4519	0.2088
1988	BC	BCF	2	0.989	0	0.0333	11.61	3.4519	-3.7580
1989	OU	OUF	2	0.657	0	0.0066	12.48	3.8219	0.0000
1989	PT	PTF	2	0.822	0	0.0066	12.48	3.8219	0.5961
1989	IN	INF	2	0.775	0	0.0333	12.48	3.8219	-0.6200
1989	OH	OHF	2	0.873	0	0.0066	12.48	3.8219	1.1592
1989	CS	CSF	2	0.600	0	0.0333	12.48	3.8219	-2.4870
1989	MF	MF	2	0.548	0	0.0066	12.48	3.8219	2.0301
1989	SJ	SJF	2	1.468	0	0.0066	12.48	3.8219	0.4660
1989	FR	FRF	2	0.500	0	0.0066	12.48	3.8219	0.3198
1989	MIS	MISF	2	1.136	0	0.0066	12.48	3.8219	1.9594
1989	IL	ILF	2	1.000	0	0.0066	12.48	3.8219	0.8694
1989	NC	NCF	2	0.666	0	0.0333	12.48	3.8219	-0.3820
1989	P	PF	2	1.022	0	0.0333	12.48	3.8219	-2.3100
1989	V	VF	2	1.075	0	0.0333	12.48	3.8219	-6.9550
1989	D	DF	2	0.939	0	0.0066	12.48	3.8219	0.8314
1989	IU	IUF	2	0.847	0	0.0333	12.48	3.8219	-0.8690
1989	KS	KSF	2	1.514	0	0.0333	12.48	3.8219	-0.3200
1989	CL	CLF	2	0.716	0	0.0333	12.48	3.8219	-4.6360
1989	GT	GTF	2	0.946	0	0.0333	12.48	3.8219	-3.9030
1989	WF	WFF	2	0.897	0	0.0066	12.48	3.8219	2.3887
1989	OS	OSF	2	0.672	0	0.0333	12.48	3.8219	-2.5290
1989	IS	ISF	2	0.477	0	0.0066	12.48	3.8219	2.2326
1989	NR	NRF	2	0.888	0	0.0066	12.48	3.8219	4.2152
1989	MR	MRF	2	0.651	0	0.0333	12.48	3.8219	-5.0580
1989	PR	PRF	2	0.563	0	0.0333	12.48	3.8219	-2.5290
1989	MN	MNF	2	0.671	0	0.0333	12.48	3.8219	-3.4770
1989	NU	NUF	2	0.560	0	0.0066	12.48	3.8219	0.0000
1989	WI	WIF	2	1.169	0	0.0333	12.48	3.8219	-1.2640
1989	MI	MIBK	2	1.044	0	0.0066	12.48	3.8219	1.0517
1989	KU	KUF	2	0.723	0	0.0066	12.48	3.8219	0.0000
1989	NCS	NCSF	2	0.795	0	0.0333	12.48	3.8219	-1.5700
1989	BC	BCF	2	0.989	0	0.0333	12.48	3.8219	-2.5290
1990	KS	KSF	2	1.514	0	0.0166	15.90	4.1743	2.6250
1990	MR	MRF	2	0.651	0	0.0166	15.90	4.1743	5.3455
1990	IS	ISF	2	0.477	0	0.0333	15.90	4.1743	-0.5700
1990	NC	NCF	2	0.666	0	0.0166	15.90	4.1743	2.0218
1990	BC	BCF	2	0.989	0	0.0333	15.90	4.1743	-1.3360
1990	WI	WIF	2	1.169	0	0.0333	15.90	4.1743	-5.3450

1990	IU	IUF	2	0.847	0	0.0166	15.90	4.1743	1.5750
1990	WF	WFF	2	0.897	0	0.0166	15.90	4.1743	0.7603
1990	OU	OUF	2	0.657	0	0.0333	15.90	4.1743	-7.3500
1990	V	VF	2	1.075	0	0.0166	15.90	4.1743	3.1181
1990	OS	OSF	2	0.672	0	0.0166	15.90	4.1743	4.4545
1990	SJ	SJF	2	1.468	0	0.0333	15.90	4.1743	-3.1620
1990	KU	KUF	2	0.723	0	0.0166	15.90	4.1743	1.2250
1990	PT	PTF	2	0.822	0	0.0333	15.90	4.1743	-6.1170
1990	OH	OHF	2	0.873	0	0.0333	15.90	4.1743	-1.2250
1990	PR	PRF	2	0.563	0	0.0333	15.90	4.1743	-0.2220
1990	MF	MF	2	0.548	0	0.0166	15.90	4.1743	0.7920
1990	P	PF	2	1.022	0	0.0333	15.90	4.1743	-1.2250
1990	NU	NUF	2	0.560	0	0.0333	15.90	4.1743	-2.6720
1990	CS	CSF	2	0.600	0	0.0166	15.90	4.1743	1.6333
1990	NR	NRF	2	0.888	0	0.0333	15.90	4.1743	-1.2250
1990	FR	FRF	2	0.500	0	0.0166	15.90	4.1743	2.7222
1990	MI	MIF	2	0.852	0	0.0166	15.90	4.1743	2.2116
1990	IL	ILF	2	1.000	0	0.0333	15.90	4.1743	-1.9680
1990	MIS	MISF	2	1.136	0	0.0166	15.90	4.1743	0.0000
1990	CL	CLF	2	0.716	1	0.0166	15.90	4.1743	2.4500
1990	NCS	NCSF	2	0.795	1	0.0333	15.90	4.1743	-0.2780
1990	GT	GTF	2	0.946	0	0.0166	15.90	4.1743	3.6355
1990	D	DF	2	0.939	0	0.0333	15.90	4.1743	-0.6330
1990	IN	INF	2	0.775	0	0.0333	15.90	4.1743	-3.1500
1990	MN	MNF	2	0.671	0	0.0166	15.90	4.1743	2.4500
1991	BC	BCF	2	0.989	0	0.0266	17.55	4.5389	2.6473
1991	OS	OSF	2	0.672	0	0.0333	17.55	4.5389	-1.2130
1991	OU	OUF	2	0.657	0	0.0333	17.55	4.5389	-2.4400
1991	MIS	MISF	2	1.136	0	0.0333	17.55	4.5389	-0.2260
1991	IN	INF	2	0.775	0	0.0266	17.55	4.5389	4.6800
1991	MI	MIF	2	0.852	0	0.0333	17.55	4.5389	-2.4260
1991	P	PF	2	1.022	0	0.0266	17.55	4.5389	0.0000
1991	MF	MF	2	0.548	0	0.0333	17.55	4.5389	-0.1760
1991	IL	ILF	2	1.000	0	0.0266	17.55	4.5389	2.6000
1991	KU	KUF	2	0.723	0	0.0266	17.55	4.5389	4.8533
1991	PR	PRF	2	0.563	0	0.0266	17.55	4.5389	2.8679
1991	KS	KSF	2	1.514	0	0.0333	17.55	4.5389	-2.2640
1991	GT	GTF	2	0.946	0	0.0333	17.55	4.5389	-0.1670
1991	IU	IUF	2	0.000	0	0.0266	17.55	4.5389	2.6000
1991	PT	PTF	2	0.822	0	0.0266	17.55	4.5389	3.8748
1991	IS	ISF	2	0.477	0	0.0266	17.55	4.5389	0.0000
1991	FR	FRF	2	0.500	0	0.0333	17.55	4.5389	-2.5280
1991	WI	WIF	2	1.169	0	0.0266	17.55	8.3289	1.3236
1991	SJ	SJF	2	1.468	0	0.0333	17.55	4.5389	-2.6030
1991	MR	MRF	2	0.651	0	0.0266	17.55	4.5389	0.0000
1991	D	DF	2	0.939	0	0.0266	17.55	4.5389	0.0000
1991	NCS	NCSF	2	0.795	1	0.0333	17.55	4.5389	-2.3480
1991	V	VF	2	1.075	0	0.0266	17.55	4.5389	2.9781
1991	NU	NUF	2	0.560	0	0.0266	17.55	4.5389	6.6182
1991	CS	CSF	2	0.600	0	0.0333	17.55	4.5389	-1.0220
1991	MN	MNF	2	0.671	1	0.0266	17.55	4.5389	0.0000
1991	WF	WFF	2	0.897	0	0.0333	17.55	4.5389	-0.1480

1991	NR	NRF	2	0.888	0	0.0266	17.55	4.5389	0.0000
1991	NC	NCF	2	0.666	0	0.0266	17.55	4.5389	1.3060
1991	OH	OHF	2	0.873	0	0.0266	17.55	4.5389	2.2150
1991	CL	CLF	2	0.716	1	0.0266	17.55	4.5389	1.2133
1982	OU	OUK	3	0.357	0	0.0139	45.20	2.3982	2.2867
1982	MIS	MISK	3	0.897	0	0.0069	45.20	2.3982	-0.5710
1982	MI	MIK	3	1.029	0	0.0069	45.20	1.2292	-0.2600
1982	WF	WFK	3	0.923	1	0.0139	45.20	2.3982	-0.4020
1982	MF	MFK	3	0.487	0	0.0139	45.20	2.3982	-1.7150
1982	SJ	SJK	3	1.218	0	0.0069	45.20	2.3982	0.2541
1982	KU	KUK	3	0.539	0	0.0069	45.20	2.3982	-1.8420
1982	PR	PRK	3	0.574	0	0.0069	45.20	2.3982	-1.1400
1982	KS	KSK	3	0.571	0	0.0139	45.20	2.3982	0.1006
1982	OS	OSK	3	0.000	0	0.0069	45.20	2.3982	-0.7620
1982	IU	IUK	3	0.882	0	0.0069	45.20	2.3982	-0.1770
1982	NU	NUK	3	0.560	0	0.0139	45.20	2.3982	0.1089
1982	IS	ISK	3	0.111	0	0.0139	45.20	2.3982	-0.7350
1982	NCS	NCSK	3	0.806	0	0.0139	45.20	2.3982	-1.1430
1982	IN	INK	3	0.561	0	0.0139	45.20	2.3982	0.1284
1982	MR	MRK	3	0.662	0	0.0069	45.20	2.3982	-1.4100
1982	IL	ILK	3	1.237	0	0.0069	45.20	2.3982	-0.7090
1982	WI	WIK	3	0.923	0	0.0069	45.20	2.3982	1.2863
1982	GT	GTK	3	0.392	0	0.0139	45.20	2.3982	1.6222
1982	PT	PTK	3	1.000	0	0.0069	45.20	2.3982	-1.2470
1982	FR	FRK	3	0.378	0	0.0139	45.20	2.3982	3.1702
1982	OH	OHK	3	0.229	0	0.0139	45.20	2.3982	0.4288
1982	D	DK	3	1.010	0	0.0069	45.20	2.3982	0.0000
1982	NC	NCK	3	0.694	0	0.0139	45.20	2.3982	-0.6230
1982	CS	CSK	3	0.100	0	0.0069	45.20	2.3982	-0.1560
1982	V	VK	3	0.655	0	0.0139	45.20	2.3982	-0.9360
1982	CL	CLK	3	0.197	0	0.0069	45.20	2.3982	-1.2470
1982	NR	NRK	3	1.010	0	0.0069	45.20	2.3982	1.7150
1982	P	PK	3	0.379	0	0.0139	45.20	2.3982	-0.1960
1982	MN	MNK	3	0.714	0	0.0139	45.20	2.3982	-2.1430
1982	BC	BCK	3	0.705	0	0.0069	45.20	2.3982	-0.9800
1983	NU	NUK	3	0.560	0	0.0343	47.40	3.0409	0.1089
1983	OS	OSK	3	0.000	0	0.0171	47.40	3.0409	-0.7620
1983	SJ	SJK	3	1.218	0	0.0343	47.40	3.0409	0.2541
1983	IL	ILK	3	1.237	0	0.0171	47.40	3.0409	-0.7090
1983	NC	NCK	3	0.694	0	0.0171	47.40	3.0409	-0.6230
1983	MIS	MISK	3	0.897	0	0.0171	47.40	3.0409	-0.5710
1983	PT	PTK	3	1.000	0	0.0171	47.40	3.0409	-1.2470
1983	IN	INK	3	0.561	0	0.0343	47.40	3.0409	0.1284
1983	CS	CSK	3	0.100	0	0.0171	47.40	3.0409	-0.1560
1983	WI	WIK	3	0.923	0	0.0343	47.40	3.0409	1.2863
1983	KU	KUK	3	0.539	0	0.0171	47.40	3.0409	-1.8420
1983	MF	MFK	3	0.487	0	0.0171	47.40	3.0409	-1.7150
1983	PR	PRK	3	0.574	0	0.0171	47.40	3.0409	-1.1430
1983	MR	MRK	3	0.662	0	0.0171	47.40	3.0409	-1.4100
1983	NCS	NCSK	3	0.806	0	0.0171	47.40	3.0409	-1.1430
1983	OH	OHK	3	0.229	0	0.0343	47.40	3.0409	0.4280
1983	IU	IUK	3	0.882	0	0.0171	47.40	3.0409	-0.1770

1983	D	DK	3	1.010	0	0.0171	47.40	3.0409	0.0000
1983	CL	CLK	3	0.197	0	0.0171	47.40	3.0409	-1.2470
1983	MN	MNK	3	0.714	0	0.0171	47.40	3.0409	-2.1430
1983	P	PK	3	0.379	0	0.0171	47.40	3.0409	-0.1960
1983	WF	WFK	3	0.923	0	0.0171	47.40	3.0409	-0.4020
1983	OU	OUK	3	0.357	0	0.0343	47.40	3.0409	2.2867
1983	V	VK	3	0.655	0	0.0171	47.40	3.0409	-0.9360
1983	NR	NRK	3	1.010	0	0.0343	47.40	3.0409	1.7150
1983	MI	MIK	3	1.029	0	0.0171	47.40	3.0409	-0.2600
1983	BC	BCK	3	0.705	0	0.0171	47.40	3.0409	-0.9800
1983	FR	FRK	3	0.666	1	0.0343	47.40	3.0409	0.2602
1983	GT	GTK	3	0.392	0	0.0343	47.40	3.0409	1.6222
1983	IS	ISK	3	0.111	0	0.0171	47.40	3.0409	-0.7350
1983	KS	KSK	3	0.571	0	0.0343	47.40	3.0409	0.1006
1984	D	DK	3	1.010	0	0.0202	53.33	3.6798	-1.9820
1984	OU	OUK	3	0.357	0	0.0404	53.33	3.6798	0.4406
1984	IL	ILK	3	1.237	0	0.0404	53.33	3.6798	0.4120
1984	KS	KSK	3	0.571	0	0.0202	53.33	3.6798	-2.2780
1984	OS	OSK	3	0.000	0	0.0404	53.33	3.6798	1.5895
1984	KU	KUK	3	0.539	0	0.0202	53.33	3.6798	-0.2410
1984	MIS	MISK	3	0.897	0	0.0404	53.33	3.6798	0.6058
1984	V	VK	3	0.655	0	0.0202	53.33	3.6798	-0.8900
1984	OH	OHK	3	0.229	0	0.0202	53.33	3.6798	-1.8170
1984	IS	ISK	3	0.111	0	0.0202	53.33	3.6798	-0.3860
1984	MN	MNK	3	0.714	0	0.0404	53.33	3.6798	2.5964
1984	PT	PTK	3	1.000	0	0.0202	53.33	3.6798	0.0000
1984	NU	NUK	3	0.560	0	0.0404	53.33	3.6798	0.8438
1984	PR	PRK	3	0.574	0	0.0202	53.33	3.6798	-0.6050
1984	GT	GTK	3	0.392	0	0.0404	53.33	3.6798	0.5792
1984	IN	INK	3	0.561	0	0.0404	53.33	3.6798	0.5712
1984	NR	NRK	3	1.010	0	0.0202	53.33	3.6798	-0.2720
1984	WI	WIK	3	0.923	0	0.0202	53.33	3.6798	0.0000
1984	BC	BCK	3	0.705	0	0.0404	53.33	3.6798	1.6617
1984	IU	IUK	3	0.882	0	0.0202	53.33	3.6798	-0.3310
1984	FR	FRK	3	0.378	1	0.0202	53.33	3.6798	-2.6900
1984	SJ	SJK	3	1.218	0	0.0404	53.33	3.6798	0.2693
1984	CL	CLK	3	0.197	0	0.0202	53.33	3.6798	0.0000
1984	MI	MIK	3	1.029	0	0.0202	53.33	3.6798	-1.4590
1984	NCS	NCSK	3	0.806	0	0.0202	53.33	3.6798	0.0000
1984	WF	WFK	3	0.923	0	0.0202	53.33	3.6798	-0.6750
1984	MR	MRK	3	0.662	0	0.0202	53.33	3.6798	-0.0660
1984	MF	MFK	3	0.487	0	0.0404	53.33	3.6798	1.2117
1984	NC	NCK	3	0.694	0	0.0404	53.33	3.6798	0.6609
1984	P	PK	3	0.379	0	0.0202	53.33	3.6798	-0.4840
1984	CS	CSK	3	0.100	0	0.0404	53.33	3.6798	2.4233
1985	KS	KSK	3	0.571	0	0.0203	67.66	4.3100	0.4172
1985	MN	MNK	3	0.714	0	0.0203	67.66	4.3100	2.3916
1985	MIS	MISK	3	0.897	0	0.0101	67.66	4.3100	-1.9250
1985	OH	OHK	3	0.229	0	0.0203	67.66	4.3100	1.9250
1985	MI	MIK	3	0.000	0	0.0203	67.66	4.3100	0.6489
1985	NR	NRK	3	1.010	0	0.0101	67.66	4.3100	-3.0330
1985	MF	MFK	3	0.487	0	0.0101	67.66	4.3100	-2.5660

1985	P	PK	3	0.379	0	0.0203	67.66	4.3100	1.5400
1985	KU	KUK	3	0.000	0	0.0203	67.66	4.3100	1.8421
1985	PR	PRK	3	0.574	0	0.0203	67.66	4.3100	0.8250
1985	IU	IUK	3	0.882	0	0.0101	67.66	4.3100	-1.6500
1985	NC	NCK	3	0.694	0	0.0203	67.66	4.3100	2.3333
1985	IS	ISK	3	0.000	0	0.0101	67.66	4.3100	-0.3600
1985	V	VK	3	0.655	0	0.0203	67.66	4.3100	1.2046
1985	IN	INK	3	0.561	0	0.0101	67.66	4.3100	-0.8250
1985	WF	WFK	3	0.923	0	0.0203	67.66	4.3100	0.9009
1985	IL	ILK	3	0.000	0	0.0101	67.66	4.3100	-1.3030
1985	NU	NUK	3	0.000	0	0.0101	67.66	4.3100	-0.6730
1985	GT	GTK	3	0.392	0	0.0203	67.66	4.3100	1.3750
1985	OU	OUK	3	0.357	0	0.0203	67.66	4.3100	0.9676
1985	FR	FRK	3	0.378	0	0.0101	67.66	4.3100	-0.3500
1985	PT	PTK	3	0.000	0	0.0203	67.66	4.3100	0.2655
1985	D	DK	3	1.010	0	0.0101	67.66	4.3100	-0.7000
1985	MR	MRK	3	0.662	0	0.0203	67.66	4.3100	1.0645
1985	CS	CSK	3	0.000	0	0.0203	67.66	4.3100	2.5667
1985	OS	OSK	3	0.000	0	0.0101	67.66	4.3100	-2.3860
1985	CL	CLK	3	0.197	0	0.0101	67.66	4.3100	-1.4000
1985	SJ	SJK	3	0.000	0	0.0203	67.66	4.3100	0.5704
1985	NCS	NCSK	3	0.806	0	0.0101	67.66	4.3100	-1.6330
1985	WI	WIK	3	0.923	0	0.0101	67.66	4.3100	0.0000
1985	BC	BCK	3	0.705	0	0.0203	67.66	4.3100	0.1645
1986	NU	NUK	3	0.000	1	0.0333	71.40	4.9511	-0.6280
1986	FR	FRK	3	0.378	0	0.0201	71.40	4.9511	3.9250
1986	GT	GTK	3	0.392	0	0.0201	71.40	4.9511	1.0092
1986	WI	WIK	3	0.923	0	0.0333	71.40	4.9511	-2.5810
1986	NR	NRK	3	1.010	0	0.0100	71.40	4.9511	0.3532
1986	V	VK	3	0.655	0	0.0100	71.40	4.9511	2.1000
1986	NCS	NCSK	3	0.806	0	0.0100	71.40	4.9511	0.0000
1986	SJ	SJK	3	0.000	0	0.0333	71.40	4.9511	-1.3350
1986	IL	ILK	3	0.000	0	0.0100	71.40	4.9511	-1.1660
1986	CL	CLK	3	0.197	0	0.0100	71.40	4.9511	-1.2840
1986	NC	NCK	3	0.694	0	0.0100	71.40	4.9511	0.7850
1986	P	PK	3	0.379	0	0.0333	71.40	4.9511	-2.1250
1986	MR	MRK	3	0.662	0	0.0333	71.40	4.9511	-1.1530
1986	OU	OUK	3	0.357	0	0.0333	71.40	4.9511	-0.1420
1986	IN	INK	3	0.561	0	0.0100	71.40	4.9511	-1.2930
1986	D	DK	3	1.010	0	0.0201	71.40	4.9511	1.7127
1986	MN	MNK	3	0.714	0	0.0333	71.40	4.9511	-1.1770
1986	KS	KSK	3	0.571	0	0.0100	71.40	4.9511	0.1624
1986	MIS	MISK	3	0.897	0	0.0100	71.40	4.9511	3.1400
1986	BC	BCK	3	0.705	0	0.0201	71.40	4.9511	0.5607
1986	IS	ISK	3	0.000	0	0.0100	71.40	4.9511	-0.3140
1986	PR	PRK	3	0.574	0	0.0100	71.40	4.9511	1.7127
1986	MI	MIK	3	0.000	0	0.0333	71.40	4.9511	-0.0280
1986	OS	OSK	3	0.000	0	0.0333	71.40	4.9511	-0.3360
1986	MF	MFK	3	0.487	0	0.0333	71.40	4.9511	-1.5700
1986	WF	WFK	3	0.923	1	0.0333	71.40	4.9511	-1.5800
1986	IU	IUK	3	0.882	0	0.0100	71.40	4.9511	2.4478
1986	CS	CSK	3	0.000	0	0.0100	71.40	4.9511	-3.4960

1986	PT	PTK	3	0.000	0	0.0333	71.40	4.9511	-1.2100
1986	OH	OHK	3	0.229	0	0.0100	71.40	4.9511	0.0000
1986	KU	KUK	3	0.000	0	0.0100	71.40	4.9511	0.7273
1987	IN	INK	3	0.842	0	0.0033	75.13	5.5922	2.2500
1987	PR	PRK	3	0.816	0	0.0033	75.13	5.5922	0.0000
1987	P	PK	3	0.655	0	0.0033	75.13	5.5922	1.9583
1987	SJ	SJK	3	1.250	0	0.0333	75.13	5.5922	-0.3230
1987	KU	KUK	3	0.565	0	0.0033	75.13	5.5922	1.7255
1987	IS	ISK	3	0.122	0	0.0033	75.13	5.5922	0.8368
1987	MF	MFK	3	0.463	0	0.0033	75.13	5.5922	2.1667
1987	V	VK	3	0.935	0	0.0333	75.13	5.5922	-3.1990
1987	OU	OUK	3	0.285	0	0.0333	75.13	5.5922	-1.7560
1987	FR	FRK	3	0.666	0	0.0333	75.13	5.5922	-1.2800
1987	MI	MIK	3	1.044	0	0.0333	75.13	5.5922	-0.6190
1987	IU	IUK	3	0.882	0	0.0333	75.13	5.5922	-1.0260
1987	MIS	MISK	3	1.117	0	0.0033	75.13	5.5922	1.0833
1987	CS	CSK	3	0.116	0	0.0333	75.13	5.5922	-3.8400
1987	OS	OSK	3	0.000	0	0.0033	75.13	5.5922	1.3929
1987	CL	CLK	3	0.197	0	0.0033	75.13	5.5922	1.7727
1987	MN	MNK	3	0.471	0	0.0033	75.13	5.5922	1.3542
1987	NU	NUK	3	0.573	0	0.0033	75.13	5.5922	1.3000
1987	MR	MRK	3	0.511	0	0.0333	75.13	5.5922	-0.6330
1987	GT	GTK	3	0.988	0	0.0033	75.13	5.5922	0.7338
1987	OH	OHK	3	0.689	0	0.0333	75.13	5.5922	-3.2500
1987	D	DK	3	1.010	0	0.0033	75.13	5.5922	0.0000
1987	NC	NCK	3	1.055	0	0.0333	75.13	5.5922	-3.8400
1987	KS	KSK	3	1.685	0	0.0033	75.13	5.5922	0.4333
1987	NCS	NCSK	3	0.956	0	0.0033	75.13	5.5922	2.3636
1987	IL	ILK	3	1.250	0	0.0333	75.13	5.5922	-0.4330
1987	BC	BCK	3	0.957	0	0.0333	75.13	5.5922	-2.6300
1987	WF	WFK	3	1.092	1	0.0333	75.13	5.5922	-3.9360
1987	PT	PTK	3	1.016	0	0.0333	75.13	5.5922	-2.3630
1987	WI	WIK	3	1.076	0	0.0033	75.13	5.5922	5.6875
1987	NR	NRK	3	1.010	0	0.0033	75.13	5.5922	1.6250
1988	WI	WIK	3	1.076	0	0.0333	77.40	6.2349	-4.3060
1988	MN	MNK	3	0.471	0	0.0196	77.40	6.2349	1.1483
1988	BC	BCK	3	0.957	0	0.0333	77.40	6.2349	-1.1710
1988	OH	OHK	3	0.689	0	0.0196	77.40	6.2349	0.0000
1988	CL	CLK	3	0.197	0	0.0196	77.40	6.2349	2.7142
1988	NR	NRK	3	1.010	0	0.0333	77.40	6.2349	-3.4450
1988	MIS	MISK	3	1.117	0	0.0333	77.40	6.2349	-3.4450
1988	P	PK	3	0.655	0	0.0333	77.40	6.2349	-1.3750
1988	CS	CSK	3	0.116	0	0.0196	77.40	6.2349	3.4450
1988	KS	KSK	3	1.685	0	0.0196	77.40	6.2349	1.5410
1988	D	DK	3	1.010	0	0.0196	77.40	6.2349	1.2527
1988	NC	NCK	3	1.055	0	0.0333	77.40	6.2349	-1.2520
1988	MI	MIK	3	1.044	0	0.0196	77.40	6.2349	0.7832
1988	SJ	SJK	3	1.250	0	0.0196	77.40	6.2349	1.8814
1988	FR	FRK	3	0.666	0	0.0333	77.40	6.2349	-3.7580
1988	V	VK	3	0.935	1	0.0333	77.40	6.2349	-1.1380
1988	GT	GTK	3	0.988	0	0.0333	77.40	6.2349	-3.2380
1988	NU	NUK	3	0.573	0	0.0196	77.40	6.2349	0.0416

1988	MF	MFK	3	0.463	0	0.0196	77.40	6.2349	2.2967
1988	OU	OUK	3	0.285	0	0.0196	77.40	6.2349	0.0438
1988	IL	ILK	3	1.250	0	0.0196	77.40	6.2349	2.1654
1988	PR	PRK	3	0.816	0	0.0196	77.40	6.2349	2.9230
1988	IN	INK	3	0.842	0	0.0196	77.40	6.2349	1.4764
1988	MR	MRK	3	0.511	0	0.0333	77.40	6.2349	-0.0920
1988	KU	KUK	3	0.565	0	0.0333	77.40	6.2349	-2.7970
1988	OS	OSK	3	0.000	0	0.0333	77.40	6.2349	-1.8700
1988	IS	ISK	3	0.122	0	0.0196	77.40	6.2349	0.6853
1988	PT	PTK	3	1.016	0	0.0196	77.40	6.2349	0.0000
1988	NCS	NCSK	3	0.956	0	0.0333	77.40	6.2349	-2.5050
1988	WF	WFK	3	1.092	1	0.0196	77.40	6.2349	2.8510
1988	IU	IUK	3	0.882	0	0.0196	77.40	6.2349	3.1116
1989	NU	NUK	3	0.573	0	0.0333	83.20	6.8739	-3.0180
1989	OH	OHK	3	0.689	0	0.0066	83.20	6.8739	4.4710
1989	OS	OSK	3	0.000	1	0.0066	83.20	6.8739	0.9273
1989	KU	KUK	3	0.565	0	0.0066	83.20	6.8739	0.2230
1989	FR	FRK	3	0.666	0	0.0066	83.20	6.8739	4.0043
1989	MF	MFK	3	0.463	0	0.0333	83.20	6.8739	-2.3180
1989	OU	OUK	3	0.285	0	0.0066	83.20	6.8739	2.6645
1989	IS	ISK	3	0.122	0	0.0333	83.20	6.8739	-0.2120
1989	P	PK	3	0.655	0	0.0066	83.20	6.8739	0.1955
1989	MN	MNK	3	0.471	0	0.0333	83.20	6.8739	-1.9870
1989	D	DK	3	1.010	0	0.0066	83.20	6.8739	91.0470
1989	MR	MRK	3	0.511	0	0.0066	83.20	6.8739	0.6978
1989	PR	PRK	3	0.816	0	0.0333	83.20	6.8739	-1.6860
1989	IL	ILK	3	1.250	0	0.0333	83.20	6.8739	-2.0510
1989	PT	PTK	3	1.016	0	0.0066	83.20	6.8739	1.2645
1989	NR	NRK	3	1.010	0	0.0066	83.20	6.8739	1.1178
1989	CS	CSK	3	0.116	0	0.0333	83.20	6.8739	-0.6320
1989	KS	KSK	3	1.685	0	0.0066	83.20	6.8739	1.2537
1989	SJ	SJK	3	1.250	0	0.0333	83.20	6.8739	-0.2390
1989	MI	MIF	3	0.852	0	0.0333	83.20	6.8739	-1.0090
1989	V	VK	3	0.935	0	0.0066	83.20	6.8739	2.0808
1989	IN	INK	3	0.842	0	0.0333	83.20	6.8739	-2.4830
1989	CL	CLK	3	0.000	0	0.0066	83.20	6.8739	0.0000
1989	NCS	NCSK	3	0.956	0	0.0333	83.20	6.8739	-5.0580
1989	WF	WFK	3	1.092	0	0.0333	83.20	6.8739	-1.7470
1989	IU	IUK	3	0.882	0	0.0333	83.20	6.8739	-2.2430
1989	WI	WIK	3	1.076	0	0.0066	83.20	6.8739	3.1049
1989	NC	NCK	3	1.055	0	0.0066	83.20	6.8739	1.2640
1989	MIS	MISK	3	1.117	0	0.0066	83.20	6.8739	1.1592
1989	GT	GTK	3	0.988	0	0.0066	83.20	6.8739	1.7884
1989	BC	BCK	3	0.957	0	0.0066	83.20	6.8739	2.4516
1990	MN	MNK	3	0.471	0	0.0333	106.00	7.4953	-0.7580
1990	MIS	MISK	3	1.117	0	0.0166	106.00	7.4953	1.2250
1990	WI	WIK	3	1.076	0	0.0333	106.00	7.4953	-3.1500
1990	BC	BCK	3	0.957	0	0.0333	106.00	7.4953	-2.1770
1990	WF	WFK	3	1.092	0	0.0166	106.00	7.4953	1.8278
1990	CS	CSK	3	0.116	0	0.0166	106.00	7.4953	1.3363
1990	MR	MRK	3	0.511	0	0.0166	106.00	7.4953	0.0164
1990	FR	FRK	3	0.666	0	0.0166	106.00	7.4953	1.2250

1990	V	VK	3	0.935	0	0.0333	106.00	7.4953	-0.2110
1990	IL	ILK	3	1.250	1	0.0166	106.00	7.4953	2.3710
1990	SJ	SJK	3	1.250	0	0.0166	106.00	7.4953	2.4956
1990	IS	ISK	3	0.122	0	0.0166	106.00	7.4953	1.6924
1990	NC	NCK	3	1.055	0	0.0333	106.00	7.4953	-2.6720
1990	KS	KSK	3	1.685	0	0.0333	106.00	7.4953	-1.4980
1990	PT	PTK	3	1.016	0	0.0333	106.00	7.4953	-1.3360
1990	MF	MFK	3	0.463	0	0.0333	106.00	7.4953	-1.2250
1990	PR	PRK	3	0.816	0	0.0166	106.00	7.4953	1.7818
1990	NU	NUK	3	0.573	0	0.0166	106.00	7.4953	1.4082
1990	NCS	NCSK	3	0.956	0	0.0166	106.00	7.4953	0.0000
1990	D	DK	3	1.010	0	0.0333	106.00	7.4953	-93.5000
1990	P	PK	3	0.655	0	0.0333	106.00	7.4953	-1.6080
1990	IN	INK	3	0.842	0	0.0166	106.00	7.4953	1.5094
1990	OU	OUK	3	0.285	0	0.0333	106.00	7.4953	-0.9420
1990	KU	KUK	3	0.565	0	0.0333	106.00	7.4953	-1.4350
1990	NR	NRK	3	1.010	0	0.0166	106.00	7.4953	2.1000
1990	CL	CLK	3	0.000	0	0.0166	106.00	7.4953	0.0000
1990	OS	OSK	3	0.000	0	0.0166	106.00	7.4953	1.4700
1990	IU	IUK	3	0.882	0	0.0166	106.00	7.4953	0.0000
1990	GT	GTK	3	0.988	0	0.0333	106.00	7.4953	-0.4900
1990	MI	MIK	3	1.044	0	0.0333	106.00	7.4953	-1.4530
1990	OH	OHK	3	0.689	0	0.0166	106.00	7.4953	0.0000
1991	NU	NUK	3	0.573	0	0.0266	117.00	7.1289	0.0000
1991	D	DK	3	1.010	0	0.0266	117.00	7.1289	0.9265
1991	KS	KSK	3	1.685	0	0.0333	117.00	7.1289	-1.4860
1991	MI	MIK	3	1.044	0	0.0266	117.00	7.1289	0.4181
1991	OH	OHK	3	0.689	0	0.0266	117.00	7.1289	0.0000
1991	PT	PTK	3	1.016	0	0.0333	117.00	7.1289	-1.3230
1991	NC	NCK	3	1.055	0	0.0266	117.00	7.1289	3.3091
1991	FR	FRK	3	0.666	0	0.0333	117.00	7.1289	-2.7570
1991	MR	MRK	3	0.511	0	0.0266	117.00	7.1289	0.3267
1991	GT	GTK	3	0.988	0	0.0266	117.00	7.1289	1.8409
1991	OU	OUK	3	0.285	0	0.0266	117.00	7.1289	0.3467
1991	SJ	SJK	3	1.250	0	0.0266	117.00	7.1289	0.5630
1991	CL	CLK	3	0.209	0	0.0266	117.00	7.1289	0.0000
1991	MF	MFK	3	0.463	0	0.0333	117.00	7.1289	-0.5650
1991	MIS	MISK	3	1.117	0	0.0333	117.00	7.1289	-5.5150
1991	IL	ILK	3	1.250	1	0.0333	117.00	7.1289	-1.8960
1991	PR	PRK	3	0.816	0	0.0333	117.00	7.1289	-5.7350
1991	V	VK	3	0.935	0	0.0333	117.00	7.1289	-1.6590
1991	NCS	NCSK	3	0.956	0	0.0266	117.00	7.1289	6.6182
1991	IN	INK	3	0.842	0	0.0333	117.00	7.1289	-20.1400
1991	MN	MNK	3	0.471	0	0.0266	117.00	7.1289	1.7911
1991	KU	KUK	3	0.565	0	0.0266	117.00	7.1289	3.3611
1991	P	PK	3	0.655	0	0.0333	117.00	7.1289	-0.0560
1991	WF	WFK	3	1.092	0	0.0333	117.00	4.5389	-0.7700
1991	NR	NRK	3	1.010	0	0.0333	117.00	7.1289	-4.5640
1991	IS	ISK	3	0.122	0	0.0333	117.00	7.1289	-3.3350
1991	BC	BCK	3	0.957	0	0.0333	117.00	7.1289	-1.7710
1991	OS	OSK	3	0.000	0	0.0266	117.00	7.1289	2.4267
1991	CS	CSK	3	0.116	0	0.0333	117.00	7.1289	-6.7280

1991	IU	IUK	3	0.882	0	0.0333	117.00	7.1289	-4.0920
1991	WI	WIK	3	1.076	0	0.0333	117.00	4.5389	-0.5200

VITA

Jill S. Harris

Candidate for the Degree of

Doctor of Philosophy

Dissertation: CHEATING IN THE NCAA: A MODEL OF CRIME IN SPORTS ADMINISTRATION

Major Field: Economics

Biographical:

Personal Data:
Born in Loma Linda, California, on July 15, 1965, the daughter of L.E. and Sharon Barnes.

Education:
Cajon High School, San Bernardino, California, (1983)
Bachelor of Arts (Economics), California State University at San Bernardino (1987)
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Professional Experience:
Adjunct Instructor, Embry-Riddle Aeronautical University, August, 1994 to present.
Adjunct Instructor, Chapman University, August, 1994 to present.
Adjunct Instructor, Phillips University, March, 1989 to May, 1993.
Teaching Assistant, Oklahoma State University, September, 1989 to May 1993.
Grain Merchandiser, Union Equity Cooperative Exchange, June, 1990 to March 1991.

Professional Affiliations:
American Economic Association
Southern Economic Association

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: 04-25-95 **IRB#:** BU-95-026

Proposal Title: CHEATING IN THE NCAA: A MODEL OF CRIME IN SPORTS ADMINISTRATION

Principal Investigator(s): Edward O. Price, Jill S. Harris

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): None

APPROVAL STATUS SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT NEXT MEETING.
APPROVAL STATUS PERIOD VALID FOR ONE CALENDAR YEAR AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD APPROVAL.
ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR APPROVAL.

Comments, Modifications/Conditions for Approval or Reasons for Deferral or Disapproval are as follows:

IF THE APPLICATION HAD BEEN SUBMITTED IN A TIMELY MANNER IT WOULD HAVE BEEN APPROVED AS EXEMPT.

Signature: John H. Wycoff Date: April 27, 1995

Chair of Institutional Review Board