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AN ANALYSIS OF COLLEGE BASKETBALL CONFERENCE STRUCTURE, CONFERENCE OFFICIALS, AND THEIR POTENTIAL EFFECT ON REVENUES

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ABSTRACT

The NCAA men's basketball tournament paid out over $122 million to athletic conferences during the 2005-06 season alone.[1] Using data from previous basketball seasons, I formulate a theory as to the actions athletic conferences may encourage their basketball referees to take in order to enhance their share of the purse. If we consider the individual team within a group of college teams acting as a division of the larger "firm," that being the conference and not an individual "firm" itself, then it is appropriate to suggest a single team would allow actions that at first glance seem detrimental. Initial research into referees' actions during games provides some slight evidence toward their favoring of particular teams depending on the possibility of those teams entering the tournament. Additionally, evidence is found to support the idea of the "home-court" advantage in officiating.

[1] http://www1.ncaa.org/finance/revenue_distribution_plan

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I would like to thank my committee members for their time, patience, and valuable suggestions. I would also like to thank my fellow graduate students for their assistance and advice on this project as well as on many others throughout my years at Clemson University.

DEDICATION

I would like to dedicate this to my family whose support I have always had no matter what choices I made in life. Without them, this would not have been possible.

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CHAPTER I

INTRODUCTION

Near the end of the 2004 football season, the University of Texas—ranked #6 in the Bowl Championship Series (BCS)[2]—played the University of Kansas, which at the time only had one conference win and an overall losing record. With 4:11 remaining in the game, Texas trailed Kansas 13 to 23. Texas managed to score two touchdowns and win the game 27 to 23. After Texas scored the first touchdown, Kansas had a chance to secure the victory on a pass which would have given them a first down, effectively allowing Kansas to run out the clock. Instead of a first down, Kansas was called for what was considered a controversial offensive pass interference penalty. Kansas eventually had to punt the ball out of its own end zone giving the ball back to Texas with 1:53 left. Texas scored and won the game. Had Texas lost the game, it would likely have missed the opportunity to play in one of the BCS bowl games. The BCS bowl games pay out a substantially larger amount to participating teams than do Non-BCS bowl games. After the game, an obviously upset Kansas head football coach, Mark Mangino, commented, "You know what this is all about, don't you? BCS. That's what made a difference today in the game. That's what made the difference in a call in front of their bench. Dollar signs." Mangino was fined by the Big 12 Conference and later issued an apology for his comments.[3]

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[2] The BCS is the current system used to determine the teams that will play for the National Championship, Fiesta Bowl, Orange Bowl, Rose Bowl, and Sugar Bowl.

[3] http://sports.yahoo.com/ncaaf/recap?gid=200411130020

In sports, you can publicly comment on the performance or lack thereof from your own team, players, or coaches, and while most times it is seen as poor taste, you can comment on the opponent, but the officials are off limits. They are present to manage the game, and their only concern is that those involved play fairly. To suggest that an official's actions only have consequences on the field of play is not plausible. Major college football and basketball are significant revenue-generating endeavors, and who wins and who loses can affect a conference's bottom line. Maybe frustrated coach Mangino was fined by the Big 12 Conference for impugning the integrity of officials, or maybe he was fined for pointing out the proverbial 800-pound gorilla in the room that some would prefer to go unnoticed. The question to answer is simple: "Do conference officials manage a game with the understanding they can affect a game? If true, do they have instruction to do so in the interest of revenue concerns, or are they simply neutral participants?" While it would be interesting to investigate both major revenue-generating college sports, football and basketball, this paper focuses on basketball and how referees can potentially influence the game.

Currently, of the 330 National Collegiate Athletic Association (NCAA) Division I-A college basketball programs, only eight are not members of an athletic conference.[4] Since the majority of university athletic programs form conferences with other teams, there must be some benefit to this practice. I contend a university is interested in increasing revenues, and forming or joining a conference is a revenue-enhancing action. They do this not by acting as a coalition of individual competing firms, but rather sub-

[4] As of 2006, Birmingham Southern, Centenary, Lipscomb, Morris Brown, Savannah St., Texas A&M Corpus Christi, Texas Pan American, and IUPU Ft. Wayne are not affiliated with a conference.

units or divisions of a larger firm—the firm being the respective conference. While the university to which the athletic department belongs is an individual institution, the athletic department freely adheres to mandates and regulations put forth by the authority of the conference. A single university may take issue with certain regulations or requirements, and if that does occur, eventually the university can withdraw its conference membership[5]. However, this rarely occurs, and universities will generally, if only begrudgingly, agree to implement conference mandates. If a university is willing to let its athletic department submit to policy from an exterior entity, then it must be an advantageous arrangement. As a result, the university becomes a component of the larger firm under the control of the commissioner.

The main goal of the firm's controlling agent—in this case the conference commissioner—should therefore be to maximize revenues to the conference thereby increasing revenues to the member university above what they could achieve individually.[6] We see this behavior already in professional sports markets like the National Football League (NFL), National Basketball Association (NBA), Major League Baseball (MLB), and National Hockey League (NHL). The NFL acts as single firm with 30 individual "sub-unit" members who agree to a revenue sharing program. The goal is maximizing revenues to the NFL, not to the Chicago Bears® or Carolina Panthers®. Successfully generating revenue for the league is the main objective even as 32

[5] The University of South Carolina was a founding member of the Atlantic Coast Conference (ACC), but left in 1971.

[6] Firm optimization theory normally says to maximize profits. The assumption of maximizing revenue will be explained in chapter IV. Alternatively, I could assume marginal cost is zero in my modeling process to reach the same outcome.

individual teams compete on the field and in the market for players to win the Super Bowl.

In economic theory, the firm is considered a profit-maximizing entity, and in this instance, the focus is on the revenue portion of the optimization problem. This paper does not deal with the concept of how a firm will operate in collegiate athletics, which is already assumed. Instead, this paper focuses on the idea of what constitutes a firm at the collegiate level and the actions of its employees. Once the firm is defined appropriately, we may see observed actions follow the basic theory of the firm.

It would be rational for the conferences to operate in the same fashion as the professional leagues, but the major difference is that there is more than just one dominate firm on the college level. The coalition of universities does not compete within the conference for payouts available to all university athletic programs. The conferences do however compete with each other within the NCAA.[7] The formation of a conference has the potential to increase revenues in several ways, including negotiations over television and radio contracts, football bowl game affiliations, and merchandise contracts, to mention a few. This paper concentrates on revenues collected by conferences from participating in the NCAA Men's Basketball Tournament and how the actions of referees can potentially increase a conference's share of the funds from the tournament. Nowhere in this paper do I suggest the presence of a bias towards particular teams within a given

[7] This statement is made in reference to the research done in this paper. The NCAA members have quite successfully colluded in the efforts to reduce the cost to the university at the expense of major sports athletes, and this is agreed upon across all conferences. There is ample research on this topic of the NCAA if the reader is interested.

conference, but rather that at the end of the season, officials may seem to favor one team over by making marginal calls to benefit the conference as a whole.

Using data from previous seasons, I attempt to explain the incentives for conferences to have "proactive" basketball officials created by the tournament system and test for any evidence of such actions. Basketball is somewhat unique in that the officials' decisions can lead to an immediate change of possession of the ball and/or an opportunity to score points. However, a referee can only make a decision favoring one team in certain situations. Continuous blatant favoritism and numerous errant calls would not go unnoticed. At it relates to referees favoring specific teams, the actions of officials are more important than the ability of the players, so the data of interest involves fouls called during a game instead of actual win totals. The players themselves will have the largest effect on the outcome of the game. The referee can award free-throw opportunities to a team by calling a foul, but he can not make the ball go in the basket. The neutrality of judges may be less important than the chance to increase revenues to all parties. The mere notion of participants of any athletic event acting in a way that impugns the purity of sports is distasteful to many, but it does and has happened.[8] However, like professional leagues, men's college basketball is a revenue-generating endeavor, and the behavior of those involved should follow that of other firms; therefore, it is worth investigation.

[8] 1919 White Sox, steroids, Olympic figure skating judges, point shaving scandals, etc.

CHAPTER II

THE COMPETITIVE ORGANIZATION OF COLLEGE BASKETBALL

This chapter is a summary of college basketball and the NCAA tournament system along with a list of the conferences covered in this paper. Most of this will be general knowledge for those familiar with college basketball, but the section on the NCAA tournament and the payout structure of revenues to conferences is not likely understood by many.

2.1 The Regular Season

The college basketball season is not identical for every member university, but the scheduling for a team follows the same basic pattern. Each university has a schedule made up of 30 games plus or minus an additional game. The university's basketball team plays other teams not affiliated with their conference as well as conference member teams. The "non-conference" or "out-of-conference" games make up the majority of games in the first half of the season. Universities may be invited to participate in tournaments at the beginning of the season in places such as Hawaii, Puerto Rico, and Alaska in an attempt provide match ups between teams rarely scheduled to play. Many of the games at the beginning of the season are scheduled between a team from one of the major conferences and a team from the one of the smaller conferences.[9] Some games are scheduled between major conference teams for television purposes.[10] Still others are scheduled between non-conference member universities for yearly in-state or regional

[9] Exactly which conferences are considered "major" will be explained later in this chapter.
[10] The ESPN "BIG 10/ACC Challenge" for example.

athletic rivalries, and many games are scheduled on a two year "home and home" basis among teams consistently ranked for television purposes.[11]

The second half of the season is when conferences play games between university members. Each basketball team plays the same number of games with conference members. Sixteen games is the typical number of conference games.[12] Some teams will play each other twice and others only once in a given season. The schedule within the conference is designed to rotate "home" and "visiting" designation while accounting for historical match-ups between teams in the conference.[13] The regular-season games determine the ranking in the conference tournament at the end of the season.

2.2 The Conference Tournaments

All of the major, mid-major, and smaller conferences have a tournament at the end of the season. They are arranged as a single elimination tournament. Some conferences have all teams participate while others allow a particular number of teams to qualify, such as only allowing the top eight or ten teams to compete. Generally, the conference tournament champion is guaranteed a slot in the NCAA tournament as the representative of the given conference. Teams do not have to win their respective conference tournament to receive an invitation to the NCAA tournament, but teams from the lesser-know conferences rarely receive an invitation unless they are conference champions.

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[11] "Home and Home" is an agreement between universities where Team A travels to play Team B, and the follow year Team B agrees to play at Team A's home court.
[12] The Pacific-10 Conference plays an 18 game conference schedule.
[13] Before Duke and the University of North Carolina would agree to expand the ACC from 8 to 12 teams, they had to be guaranteed to always play each other twice during the regular season.

2.3 The NCAA Tournament

The NCAA tournament is a single elimination tournament, which at the time of this paper, begins with 65 teams. The first game, the "play in game," is between the 64th and 65th team in order to reduce the field to an even number before the tournament begins. Once the tournament begins, each round eliminates half of the field until there is an overall champion (64, 32, 16, 8, 4, 2, and finally 1). The 64 teams are separated into four sections of 16 teams. In each section, each team is ranked 1 through 16 by the tournament selection committee. The teams considered relatively more talented are given a ranking of 1 and the least talented are given a 16 ranking. Each ranking is called a "seed." Each bracket of teams is reduced to one remaining team, and those teams play the winners of the three other brackets in the single elimination playoff.

Teams are selected to participate in the tournament by one of two criteria. Thirty-one teams are automatically qualified for the tournament by representing their respective conference. These teams are either the conference-tournament champions or regular-season champions depending on the conference. Thirty-four teams are given "at large" bids for the tournament. The "at large" teams are determined by the selection committee which uses several factors in deciding which teams to choose including, but not limited to overall wins, conference wins, and quality of opponents. Based on their superior performance through the course of a season, some teams will earn an "at large" bid regardless of winning or losing their respective conference tournament championship. The remaining bids are given to other marginally talented teams. These teams are referred to as "bubble" teams because even though they may qualify for the tournament they are

not guaranteed a place in the tournament. While the same factors are used to measure all the teams, there seems to be some discretion in the "bubble" teams chosen by the selection committee. There is no publicized explanation for choices made by the selection committee, meetings are not open to the public, nor is the selection committee required to justify choices to the universities or public.

The conferences affiliated with the Men's National Basketball Tournament are paid revenues from the tournament based on the system where teams earn "units." The following is from the NCAA website explaining how the NCAA distributes revenue to the conferences:

> The basketball fund provides for moneys to be distributed to Division I conferences based on their performance in the Division I Men's Basketball Championship over a six-year rolling period (for the period 2000-2005 for the 2005-06 distribution). Independent institutions receive a full unit share based on its tournament participation over the same rolling six-year period. The basketball fund payments are sent to conferences and independent institutions in mid-April each year. One unit is awarded to each institution participating in each game, except the championship game. In 2004-05, each basketball unit was awarded approximately $152,000 for a total $113.7 million distribution. In 2005-06, each basketball unit will be awarded approximately $164,000 for a total $122.8 million distribution.[14]

[14] http://www1.ncaa.org/finance/revenue_distribution_plan

A conference is paid based on the number of units earned by its teams that year and the preceding five years. There are no units earned for the final championship game. The money is sent to the conferences and not to the individual teams unless the school does not belong to a conference. How the money is distributed after that is dependent on the conference rules.

2.4 The Six Major Conferences

Of the 31 conferences affiliated with NCAA, only six are considered major conferences.[15] The universities making up these six conference members are generally the larger state schools, but some are private institutions. Seventy-three of the 330 (I-A) universities are in these six conferences. The history of how they became the dominant players in the world of college sports is interesting but beyond the scope of the paper. The teams in each conference have been listed in the following table.

[15] In football, the conference champions of these six conferences are the only teams guaranteed an invitation to the BCS bowl games.

Table 2.0 Teams of the Major Conferences

Atlantic Coast Conference (ACC)	Big East Conference (Big East)	Big Ten Conference (11) (Big 10)
Boston College	University of Cincinnati	University of Illinois
Clemson University	University of Connecticut	Indiana University
Duke University	DePaul University	University of Iowa
Florida State University	Georgetown University	University of Michigan
Georgia Tech	University of Louisville	Michigan State University
University of Maryland	Marquette University	University of Minnesota
University of Miami	University of Notre Dame	Northwestern University
Univ. of North Carolina	University of Pittsburgh	Ohio State University
North Carolina State Univ.	Providence College	Penn State University
University of Virginia	Rutgers University	Purdue University
Virginia Tech	St. John's University	University of Wisconsin
Wake Forest University	Seton Hall University	
	University of South Florida	
	Syracuse University	
	Villanova University	
	West Virginia University	

Big Twelve Conference (Big 12)	Pacific Ten Conference (Pac 10)	Southeastern Conference (SEC)
Baylor University	University of Arizona	University of Alabama
University of Colorado	Arizona State University	University of Arkansas
Iowa State University	University of California	Auburn University
University of Kansas	University of Oregon	University of Florida
Kansas State University	Oregon State University	University of Georgia
University of Missouri	Stanford University	University of Kentucky
University of Nebraska	Univ. of Cal. Los Angeles	Louisiana State University
University of Oklahoma	Univ. of Southern Cal.	University of Mississippi
Oklahoma State University	University of Washington	Mississippi State Univ.
University of Texas	Washington State Univ.	Univ. of South Carolina
Texas A&M University		University of Tennessee
Texas Tech University		Vanderbilt University

CHAPTER III

PREVIOUS RESEARCH

3.1 Introduction

This section focuses on two different existing areas of important research in my examination of college basketball referees: the interplay of officials and their potential effect on sporting outcomes and the discussion of the organizational structure and nature on sporting leagues as it relates to noncompetitive agreements. In addition, there are other theories I am able to draw from in creating my model of behavior. While there is extensive research in the field of sports economics—some even about referees—there is very little empirical or theoretical analysis of basket officials as active participants with which to compare my work.[16] Fortunately, however, there is such research related to referees in different sports in the economic literature and within other fields of study. The literature associated with league structure provides the foundation for the essential assumption that the controlling conference agents will favor referee involvement in the interest of maximizing conference revenues.

3.2 Referees as Active Participants

The work done on referees in soccer[17] by Garicano *et al.* (2005) and Rickman and Witt (2005) provide empirical evidence of referee bias based on the circumstances of the game. Research most similar in nature to this paper was done by Thu *et al.* (2002) and published in the journal *Human Organization*. This empirical study analyzed fouls in

[16] One widely known paper on this subject is *Crime on the Court* (McCormick and Tollison, 1984) dealing with the effect of having three referees instead of two and how it affects fouls called during a game.
[17] European football if you prefer.

college basketball and found a relationship between referee foul calling and the televised broadcast of the game.

Garicano *et al.* (2005)'s study found favoritism by referees towards the home team by lengthening the game when the home team was behind and shortening the game when the home team was winning. They argued that the incentive to behave in this manner was social pressure by the home soccer fans in the crowd. The referees accomplished this by altering the amount of "injury time" added at the end of the regulation time period. Injury time can be added to the end of each half and is done so to make up for game stoppages like injuries, intentional wasting of time, fighting, or any other action not consider part of play. The exact amount of time added was at the discretion of the referees. Interesting however, they observed this effect only when the contest was close, a one goal lead or deficit. There was no evidence of a referee bias in "injury time" favoring the home team when the lead or deficit was larger than one goal. There was no statistical difference in the likelihood of scoring a goal during regular or injury, so the referees could only increase the period of time possible to score a goal not increase the chance of the home time scoring.

Rickman and Witt (2005) followed this with similar research on the English Premier League with additional work focusing on changes that followed the introduction of professional referees. Following the same procedure as Garicano *et al.* (2005), they found evidence of favoritism in close games toward the home team, though not as strong of an effect. An explanation as to the different levels a bias in home games depending on the country was also presented to explain the difference. Teams relatively close to other

members of a soccer league would likely have less of an advantage from referee favoritism. The closer two teams are by distance the less costly it is for fans of the away team to attend the games. Therefore, there is less incentive from crowd pressure on the referees. This explains why there is a greater "injury time" bias in the U.S. league and a relatively much smaller effect in England. Distances between major U.S. cities where the MLS teams are located is much greater than the teams in Europe.

The other important aspect of this paper is the effect of professional referees. In the 2001-02 season, the Premier League began using full-time referees. Referees were subjected to a new, more stringent system of monitoring performance. They had required meetings on officiating games, fitness tests, constant evaluations, and faced sanctions for poor performance with the eventual possibility of dismissal. Rickman and Witt (2005) found no evidence of favoritism toward the home team after the institution of professional referees. It would be more applicable to consider teams in the European leagues as individual firms because teams have the possibility of being moved up or down in divisional levels depending on that year's performance.

The paper by Thu *et al.* (2002) runs parallel with the maximizing objective of my work by describing a method of using proactive referees to increase athletic conference revenues. This paper centers on the cultural aspects of "fair play" within sports, but I prefer to focus on the data as it relates to my theory on referees. The research done by Thu *et al.* (2002) found referees were more likely to call a significantly higher number of fouls on the team in the lead, but only when the game was televised on the major

networks.[18] When games were carried by regions secondary stations, there was no significant effect on fouls called on the team with the lead. The conclusion was that referees called the game in a way as to keep it competitive, and thereby, more entertaining. More entertaining games earn higher television ratings. The broadcast rights to air college athletics are typically negotiated at the conference level and not by the individual teams.[19] There is no direct mention of what incentive a basketball referee has to engage in this method of game management outside of the discussion of societal norms and the idea of "fair play." However, with the lucrative contracts awarded to collegiate athletic conferences for broadcast rights, it is not difficult to propose a theory where referees are working at the behest of the controlling conference agents during the season when my theory of proactive referees is concentrated at the end of the season.

3.3 Defining a Sports League

The discussion of what a sports league or association of teams exactly is spans law and economic literature, particularly since in this area there is a natural overlap of the subject matter. It deals with such issues as antitrust law, organizational business structure, competition, monopoly power, social welfare, and how the law should approach decisions in this setting. It seems the center of discussion focuses on attempting to determine if sports leagues are an alliance of horizontal competitors or a single entity, and the legal and economic ramifications of each.

[18] ABC, CBS, NBC, and ESPN

[19] An exception is the University of Notre Dame football program. Notre Dame Football is considered independent while the basketball program is affiliated with the Big East Conference. The football program has an exclusive television contract with NBC for the broadcasting right for home games.

In one particular article, G. Roberts (1989) comments on professional leagues such as the NFL, but the ideas put forth in his argument can easily be applied to college sports and athletic conference. He argues the league, and not the individual team, is the firm of importance when dealing in antitrust analysis. Teams have an economic interest that is dependent on the league in professional sports. While each team may be independently owned, they are dependent on the existence of the member teams for their own continuation as viable enterprises. There is not much reason to watch the Green Bay Packers® play football if the other 29 teams do not exist. Of course universities athletics could and do exist without the formation of conferences, but that is not what we observe in the vast majority of cases.[20] There must be some economic interest in the formation of these conferences.

The paper by Flynn and Gilbert (2001) also deals with professional sports leagues and how to analyze them in the legal setting. The argument again hinges on the idea that leagues are either individual firms colluding to lessen competition in a cartel fashion, or single firms producing one output—professional sports. This paper discusses several legal cases involving antitrust matters. The MLB, NFL, and NHL are associations of individually owned teams, while the relatively new leagues of Major League Soccer (MLS), Women's National Basketball Association (WNBA), and the possible future Women's Professional Soccer are all organized as single entities. They suggest this is done to avoid the antitrust issues the other leagues are forced to navigate. The authors present an argument to separate the actions of sports leagues into *ex ante* (beforehand)

[20] Notre Dame Football and the athletic departments of the Army and Navy Service Academies are examples. The Air Force Academy, however, is part of the Mountain West Conference.

and *ex post* (after the fact) toward competition issues as a method for determining when leagues are acting in a noncompetitive manor. The portion of interest in Flynn and Gilbert's (2001) work is the idea of sports leagues as joint ventures. Professional teams like those in the NFL are owned separately, but all the teams of the NFL produce a single product—professional football. They would be unable to produce their product without each other, so even though each team franchise is independently owned, they are dependent on the existence of other franchises.

3.4 Other Related Works

The following papers are used to provide guidance to my research particularly in the formation of my model. I did not follow one specific theory or model previously used in others' work because, to my knowledge, one does not exist, but ideas from this literature provide some foundation for the assumptions I make.

The study of sumo wrestling from Duggan and Levitt (2002) provides an example of how the marginal value of one more win does not necessarily have to be equal to both parties, and this is important in my model of conferences encouraging certain behavior from the referees. Duggan and Levitt's (2002) research into the organized sport of sumo wrestling does not deal with the lack of impartiality on the part of referee. Instead, their paper suggests a possible arrangement between wrestlers, or at the minimum, a lack of effort on the part of certain wrestlers depending on the situation during the competition. In sumo wrestling, a tournament consists of 15 bouts. If a wrestler wins eight or more out of 15 (called kachi-koshi), the wrestler is guaranteed to increase his ranking. The bouts of interest in this paper are when a sumo wrestler enters the final match with a record of

seven wins and seven loses against an opponent that has already eight victories. The wrestler with an even seven wins and seven loses is considered on the bubble. Duggan and Levitt (2002) found a significant effect on likelihood of winning if the wrestler was "on the bubble." Two possible reasons given for this outcome were corruption in the matches or extra effort on the part of the wrestler. Further analysis favored corruption as the reason sumo wrestlers on the bubble won more often than to be expected.

Baumol (1962) provides the theory of expansion of the firm has some applications for my model. In this paper the theory firms will maximize sales (revenue) as a proxy to maximize growth of the firm in the long term instead of profits in an oligopolistic industry setting. Profits become a means to acquire capital for continued growth. First, when looking at the six major conferences, college basketball could be considered a concentrated mutually interdependent business setting as it relates to competition between the major conferences. Second, constraints on the conference commissioners may lend themselves to revenue maximization with the important difference being that the commissioner is not the sole residual claimant, but is an agent. I will elaborate on this in the next chapter.

CHAPTER IV

A MODEL OF CONFERENCE BEHAVIOR

To suggest a method to explain how a firm—in this case, the conference—can encourage revenue-enhancing actions by its basketball referees, I must first explain the incentives structure. The parties of interest are the individual conference members and the conference controlling agent. The relationship within the conference arrangement allows both parties to benefit which is why it is the prevailing condition in college sports.

4. 1 The Conference Member

The individual university that elects to become a conference member must do so for the benefits that accompany the association. Specifically for the purposes of this paper, I can focus on the athletic department, because I assume all decisions made on such matters occur here. The sources of revenue can come from different means, but I group them into two sources: revenue directly associated with sporting outcomes that can be affected by joining a conference, and those revenue sources indirectly associated with the results of the game. Though I can attempt to loosely categorize revenue streams, it is not necessary to specifically label a revenue source because they are all related. Instead, it is more important to understand how joining a conference can increase certain revenue sources. Some “direct” sources would be television revenue, payouts from post season tournaments or bowl games, and ticket sales. Example of the “non-direct” would be

donations to the athletic departments [21], school affiliated merchandise, localized advertisements, and even concession sales of food and beverage. "Non-direct" sources are generally paid to a university regardless of conference affiliation.

It is possible to begin with the basic profit-maximizing objective. I assume costs are fixed or are taken on a yearly basis and have occurred before the start of the athletic season, and they can not be altered to have an effect during the season.[22] It is feasible to model the universities object without fixed costs or some constant marginal cost, but it adds nothing to the analysis. In this scenario, profit can only be affected by increasing revenues to the goal of marginal revenue equating to zero.

1.1 $$TR - \overline{TC} = \Pi$$

1.2 $$MR = MC = 0$$

Of more importance is that the proposed total revenue comes from the direct and indirect sources. Joining a conference will have a positive effect on direct sources and therefore increase total revenue. Payments, regardless of the distribution methods, from events such as conference tournaments or larger television contracts would not be available to an individual team.

1.3 $$TR = R_D + R_I$$

1.4 $$R_{D(NoConference)} < R_{D(ConferenceMember)}$$

1.5 $$\Pi_{NC} < \Pi_{CM}$$

[21] Some universities have historically poor records of performance on the field and yet donations to the athletic department remain relatively robust. Referring to football, one specific school in the state of South Carolina comes to mind

[22] Coaches have been hired. Practice and player facilities have been built and funded.

As a result, an athletic department maximizes profits by maximizing revenues. They do so by joining a conference. Revenue will be higher for an athletic department if the university joins a conference as compared to the alternative, the university not being affiliated with a conference. It follows, then, that the profits will be greater. When this is not the case, there will be no conference affiliation.[23]

The athletic directors of the individual universities are not the residual claimants as we think of them in the economic theory of the firm. Rather than the residual claimant, they are agents with the ability to determine how the funds are spent in the athletic departments. Since most funds for the major conferences come from basketball, football, and the occasional baseball program, the athletic director determines how these funds are distributed to all the other sports, new facilities or renovations, or perhaps the director may invest in a new administrative jet. The utility function of the athletic director could be modeled as such:

1.6 $$U^* = f(I, AB, E)$$

Where

I: Income and other monetary bonuses

AB: Size of Athletic Budget

E: Any extra amenities of the position

A larger athletic budget (AB) provides opportunity for spending priorities. This is increased by revenues from conference affiliation and thereby increasing the utility of the director.

[23] Notre Dame Football

4.2 The Conference Commissioner

The conference commissioner has an obvious incentive for the existence and growth of the conference and its revenues. The job does not exist without the affiliation of the universities. The commissioner is an agent for the principals, or the universities. The agent is responsible for acting in the interest of the conference members. The commissioner can be given similar maximization of profit and utility problems with some slight variations.

1.1 $$TR - \overline{TC} = \Pi$$

1.2 $$MR = MC = 0$$

As before, I assume costs are fixed for the commissioner. For the commissioner, the cost of athletics is largely exogenous because it occurs at the university level. I assume the cost of operating a conference management system is negligible compared to the costs of the sum total of the universities. The conference agent, therefore, maximizes profits where marginal revenue is zero, thereby maximizing total revenues. For the commissioner, total revenue is the only revenue source directly related to competition of the conference members, so as it relates to universities:

1.7 $$TR = R_D$$

The conference commissioner's utility function is not the same as the athletic director because the revenues are distributed to the member universities, or the residual claimants in this case. How the revenues are distributed is determined by conference policy and not at the commissioner's discretion.

1.8 $$U^* = f(I, E)$$

Where

I: Income and other monetary bonuses

E: Any extra amenities of the position

Increases in I or E may be dependent on increases in revenues to the member universities. This may provide some additional incentive to maximize revenues by the conference commissioner.

The commissioner also has authority over the Director of Officials. The Director of Officials, as the title implies, is responsible for all matters related to conference referees: pay, scheduling, grievances, hiring, dismissals, evaluations, etc. The director is charged with monitoring the officials throughout the season, so the commissioner only needs to construct one covert arrangement with one subordinate employee concerning the basketball officials. The Director of Officials has no incentive to encourage such behavior without approval from a higher authority, because the director can not directly gain from the actions of the referees. Only through the commissioner can the director gain from encouraging, by whatever means, subordinates to bias calls during a basketball game. The director needs the approval of the commissioner just as the commissioner must have the consent of conference members—athough it need not be codified in any regulations. In fact, it would be surprising if any physical evidence of such an arrangement existed.

4.3 Misaligned incentives

The goal of the managing agents of a conference should promote activities enhancing revenues to the firm. The willing cooperation of member universities can be

explained by joint venture theory, but while proactive officials in certain situations benefit the conference it would directly conflict with parties at each individual school. The parties are the players, coaches, and fans. I assume with some confidence the main goal of the basketball teams is to win regardless of the effect on the conference. Because of the NCAA's cartel-like agreement, the athletes can not legally receive direct payment to participate in a sporting event on the college level. This reduces the cost of competing for players, particularly football and basketball players, when considering the revenue generated by 1-A college football and basketball programs. This makes non-monetary rewards relatively more valuable. Players would benefit from such things as positive exposure, increased reputation on campus, and better statistics in hopes of reaching the professional level. They cannot legally accrue any monetary benefits from losing a game intentionally, but do bare the cost of losing. A coach's pay, bonuses, and tenure at a university are normally based in some fashion on performance. I am unaware of any contract incentives encouraging coaches to lose games that might benefit the conference. Again, any benefits for increasing the likelihood of losing certain games would not directly go to the coaching staff. On the other hand, the costs of angering fans, and more importantly, members of athletic contribution groups (booster clubs), and losing potential recruits would fall on the coaches. A team's fans certainly would have the least to benefit from a "proactive" referee, when it is not in their favor of course. They too bare the cost in terms of the loss of utility they associate with a perception of their favorite team being disadvantaged. "It makes the conference better off as a whole" would not likely to be an acceptable reason to give fans.

All of the previously mentioned groups who should oppose to such actions by officials may not be enough to dissuade conference management from encouraging the behavior. The revenues are distributed directly to the conference headquarters which is then distributed to all the universities based on the revenue sharing agreement, but the cost of these actions is only placed on the specific teams considered not likely to make the tournament. The groups previously mentioned may be disadvantaged, but not to any great extent, by proactive officials when it occurs in only a few games. After all, a player's chance of playing professionally is not determined by one or two games. A coach being fired is most likely in response to the team's performance during one or more seasons and not a couple of games. Fans rarely, if ever, stop supporting a team based on the outcome of one game.

4.4 Conditions for Tournament Manipulation

Relating to college basketball, the actions of the controlling agents of each conference are charged to act in the interest of the member university. In order to maximize monetary revenues, a conference's director will act in a manner, through the Director of Officials, which results in the opportunity for as many member teams to reach the tournament as possible. Having more teams in the tournament results in more units to accrue for the conference. After enough games have be played to determine the relative strength of teams within the conference and the likelihood of reaching the national tournament, teams deemed to have the possibility of being selected for the national tournament are "assisted." There are three scenarios of interest where the actions of the officials can benefit the conference. Teams certain to make the tournament should have a

lower percentage of total fouls called against them when playing a team considered to have no chance of reaching the tournament. Teams considered "on the bubble" should also have a lower percentage of total fouls called against them when playing a team unlikely to make the tournament. The other scenario to consider is when a team certain to be selected for the tournament plays a "bubble" team. In this situation, it is important to determine the relative value of increasing the likelihood of having another team selected from the conference to the national tournament versus a tournament team earning a lower seed resulting from a loss.[24] If the value of one more team from the conference is higher than the value of earning a lower seed for a tournament team, then the bubble team should have a lower percentage of total fouls called during the game. Evidence of these actions when controlling for other effects may suggest proactive officials attempting to influence the outcome of game.

A conference is made up of member universities, and in some sense they must all be complicit in these actions even with the groups at each university opposed to it. Each university must see itself as part of the larger "firm" and act accordingly to be successful. As long as proactive officials do not consistently favor specific teams but teams in specific situations, then it is possible to speculate the member universities would allow it. How is that possible? A hypothetical example may help to explain. Suppose at the end of the season, team "A" plays team "B". Team "A" may possibly make the national tournament with one more win. Team "B" has a losing record and no chance of qualifying for the tournament. If team "A" wins and is selected for the tournament, the

[24] This will be explained later in further detail.

conference will increase its revenues by at least one unit.[25] Team "B" will share in a portion of these revenues depending on the agreement within the conference. If team "B" wins, they still finish the season with a losing record. As a result, team "A" will not make the tournament and the all the members of the conference receive less from the tournament basketball payout. As long as the actions of proactive officials result in additional revenues for all conference members they otherwise would not earn acting independently, each university has the incentive to allow such behavior.[26]

[25] If team "A" progresses further than the first round it will earn addition units for the conference. Also, it is important to remember earning units in the present year effects conference revenue for the next six years.
[26] This line of thinking somewhat follows the paper by Steven D. Levitt on Sumo Wrestling with the idea being a loss to one party would not be as detrimental as it would be to the other.

CHAPTER V

DETERMINING THE EXPECTED VALUE OF NCAA TOURNAMENT PAYOUTS

5. 1 Introduction

Given the payout structure of the tournament, it was necessary to consider the financial benefits of increasing the number of teams in the tournament. This is done by determining a specific value of each "seed" in the tournament. Additionally, I want to provide support for favoring one team over another. The conference officials will favor a "Tournament" team or a "Bubble" team over an "Out" team, but the incentive to assist one team over another in the scenario in which a "Tournament" team plays a "Bubble" team must be analyzed further to determine how the conference could potentially act to increase revenues.

5.2 Dataset

The data set is the number of units earned by each "seed" for 1985 through 2006. 1985 was the first year the men's tournament expanded to 64 teams split into four brackets. The data set is used to determine the probabilities of earning differing numbers of units depending on the "seed" selection.

5.3 The Model

The model uses a multinomial logistic based on the different possible number of units each seed can earn. With that and the value of a unit from 2005-06, I estimated the expected value of a "seed" for a given year. The conferences are paid on a rolling six-year period, but a team can only affect the number of units in the current year, so the

value of a seed is based on a one year period. The value of one 2005-06 unit is $164,000. Using this value and the probabilities from a multinomial logistic regression, the expected revenues for each seed are determined. The logistic regression, Table [A.0], is reported in Appendix A. The following two tables are produced using the logistic regression information. Table [5.0] lists the probabilities of each potential number of units by each seed. Table [5.1] lists the value of each seed by expected payout and the differences between seeds.

5.4 Empirical Results and Conclusions

Table 5.0 Tournaments 1985-2006 Probability of Units Earned by Seed					
	Units				
Seed	1	2	3	4	5
1	4.45%	22.26%	18.43%	19.92%	34.94%
2	7.47%	28.17%	21.25%	18.73%	24.38%
3	11.68%	33.23%	22.83%	16.42%	15.85%
4	17.11%	36.74%	22.99%	13.49%	9.66%
5	23.70%	38.38%	21.88%	10.47%	5.56%
6	31.24%	38.16%	19.82%	7.73%	3.05%
7	39.42%	36.33%	17.19%	5.47%	1.60%
8	47.86%	33.27%	14.34%	3.72%	0.81%
9	56.15%	29.44%	11.56%	2.45%	0.39%
10	63.92%	25.28%	9.04%	1.56%	0.19%
11	70.90%	21.15%	6.89%	0.97%	0.09%
12	76.92%	17.31%	5.14%	0.59%	0.04%
13	81.95%	13.91%	3.76%	0.35%	0.02%
14	86.05%	11.02%	2.71%	0.21%	0.01%
15	89.31%	8.63%	1.94%	0.12%	0.00%
16	91.87%	6.69%	1.37%	0.07%	0.00%
Payouts	$164,000	$328,000	$492,000	$656,000	$820,000
$164,000 Unit value in 2006					

Table 5.1 Breakdown of Seed Payouts

Seed	Expected Payout	Difference per Seed	%	Difference from 1 Seed	%
1	$588,180.23				
2	$531,993.97	-$56,186.25	-10.56%	-$56,186.25	-10.56%
3	$478,125.86	-$53,868.11	-11.27%	-$110,054.36	-23.02%
4	$429,418.75	-$48,707.11	-11.34%	-$158,761.48	-36.97%
5	$386,729.79	-$42,688.95	-11.04%	-$201,450.43	-52.09%
6	$349,640.03	-$37,089.76	-10.61%	-$238,540.20	-68.22%
7	$317,348.87	-$32,291.16	-10.18%	-$270,831.35	-85.34%
8	$289,205.39	-$28,143.48	-9.73%	-$298,974.84	-103.38%
9	$264,834.14	-$24,371.25	-9.20%	-$323,346.09	-122.09%
10	$244,035.59	-$20,798.55	-8.52%	-$344,144.64	-141.02%
11	$226,639.05	-$17,396.55	-7.68%	-$361,541.18	-159.52%
12	$212,405.75	-$14,233.30	-6.70%	-$375,774.48	-176.91%
13	$201,006.26	-$11,399.49	-5.67%	-$387,173.97	-192.62%
14	$192,047.00	-$8,959.25	-4.67%	-$396,133.23	-206.27%
15	$185,115.52	-$6,931.48	-3.74%	-$403,064.70	-217.74%
16	$179,819.23	-$5,296.30	-2.95%	-$408,361.00	-227.10%

Tables [5.0] and [5.1] demonstrate, as expected, the lower seeds have a lower expected value. Teams are seeded based on relative quality, so the farther from a number-1 seed, the less likely a team is to continue in the tournament. The data suggests one more team qualifying for the tournament is more valuable than a "tournament" team moving down one seed. For example, consider two teams within a conference. Team "A" is likely to earn a 1 seed and team "B" is considered a bubble team. At the end of the season, these two teams play each other. If team "B" wins and then makes the national tournament as a 16 seed, the conference's expected payout increases by at least $179,819.[27] As a result of losing, team "A" will enter the tournament as a 2 seed. The conference loses only $56,189 in expected payout. In most cases the small conferences that receive an automatic bid to the tournament earn seeds on the low end (12-16) and teams considered "bubble" teams from the major conference earning "at large" bids will usually be seeded in the next tier (8-12). The explanation for this is that many of the smaller conference teams awarded an automatic bid are still considered less skilled than the larger conference "bubble" teams uncertain to make the tournament through the "at large" bid process. Examining the expected payout for seeds 8 through 12 further strengthens the idea that having one more member university in the tournament is more valuable than losing a seed ranking for another conference member. The largest possible loss, $56,189, is still moving down from a 1 to a 2 seed, but when compared to the value of a 10 seed, $244,035.59, the incentive becomes even greater to manipulate the outcome, if possible.

[27] This number is actually an overestimation, because the expected payout is based on probabilities. To date a (16) seed has never beaten a (1) seed, so until it happens, the increase would be the value of one unit.

The conference commissioner and members must draw the same conclusion that additional teams are more valuable to the conference than higher seeds, so this becomes the underpinning for the theory presented in this paper. In certain situations, particular basketball teams will receive preferential treatment from the referees at the behest of the commissioner with full knowledge from the conference members, because doing so is in the controlling parties' interest. The conference employees, the referees, are simply acting in a manner that brings in more revenue for all involved.

CHAPTER VI

ANAYLSIS OF REFEREE BIAS

6. 1 Introduction

The previous chapter focuses on the rationale behind favoring one team over another depending what classification the team is assigned. This chapter is the segment where I try to find any evidence to support my theory. Referees are the tool with which the conference commissioner and the conference members can gain additional revenues from the NCAA tournament, so any evidence of bias in fouls called during a game provide evidence to indicate neutrality may not always be what is expected from a conference employee. Again, this is not focused on the actually game results in college basketball, but instead, I am looking specifically at the actions of referees.

6.2 Dataset

The data set is from the 2004-05 and 2005-06 seasons for basketball games from six major conferences. These six major conferences generally receive the majority of the "at-large" bids. In the 2004-05 season, 25 of the 34 "at large" bids went to these six conferences. They received 26 of the 34 "at large" bids during the 2005-06 season. As a result, the six major conferences earn the majority of the revenues from the tournament. The data set covers the last eight games of the regular season, or roughly the last four weeks, and the conference tournament games. The vast majority of games within this period are intra-conference games. All the observations are between teams within a conference to eliminate the problem of games between teams of different conferences.

The general rule in that situation is the visiting team's conference referees will officiate the game, but this paper focuses on officials' effects within their own conference.

Teams are classified into three groups: "Tournament" teams will make the tournament, "Bubble" teams are marginal teams, and "Out" teams will not make the tournament.[28] Information from the NCAA website is also included demonstrating how the distribution of funds for the most recent year is determined and the payout amounts for previous years.

Table 6.0 Distribution of Basketball-Related Funds According to Number of Units by Conference, 2000-2005

Conferences	2000	2001	2002	2003	2004	2005	Total Units	Projected Distribution
ACC	10	15	12	9	19	15	80	$13,118,505
Big 12	15	9	19	19	14	12	88	$14,430,355
Big East	13	10	12	14	16	13	78	$12,790,542
Big Ten .	19	17	13	13	6	16	84	$13,774,430
Pacific-10	8	17	15	11	4	9	64	$10,494,804
SEC	16	11	11	12	13	10	73	$11,970,636
6 Conf. Total	81	79	82	78	72	75	467	$76,579,272
GRAND TOTALS:	124	125	125	125	125	125	749	$122,822,000
(6 Conf. Total) / (Grand Total)	65.3%	63.2%	65.6%	62.4%	57.6%	60.0%	62.3%	62.3%

Six out of 31 conferences account for roughly 60% of the total funds paid out each year in the available data.

[28] The classification of teams was changed for three trials of the regression analysis in an attempt to find the most accurate results. There are rules used to decide on the classification, but like finding the correct regression model it is an art rather than exact science. More explanation will accompany the results.

Table 6.1 Division I Basketball Fund Payout per Conference					
CONFERENCE	2000-01	2001-02	2002-03	2003-04	2004-05
Atlantic Coast	7,056,452	7,550,336	9,802,279	9,867,470	11,250,770
Big 12	6,586,021	6,442,953	9,148,794	10,854,217	12,923,182
Big East	6,868,279	7,348,993	9,018,096	10,431,326	11,858,920
Big Ten	7,338,710	8,859,060	12,285,523	13,250,603	13,379,294
Pacific-10	5,927,419	6,845,638	9,932,976	10,008,434	9,122,246
Southeastern	7,715,054	7,852,349	9,540,885	10,713,253	12,010,957
6 Conf. Total	$41,491,935	$44,899,329	$59,728,553	$65,125,303	$70,545,369
Grand Total	$69,999,996	$75,000,001	$97,499,996	$105,300,001	$113,724,003
(6 Conf. Total)/ (Grand Total)	59.3%	59.9%	61.3%	61.8%	62.0%

Addition data on all I-A conferences in NCAA is provided in Appendix A.

6.3 The Model

The model of fouls called in a game is based on the ratio of fouls called on a given team based on the total number of fouls called in a defined period. The dependent variable is a transformation of the data to create a ratio of fouls on one team versus the total fouls in a given period. The model is a simple Ordinary Least Squares regression. The regression is run on fouls in the first half, second half, and the game as a whole.

$$1sthalf = \frac{Team_i 1stHalfFouls}{Total 1stHalfFouls}$$

$$2ndhalf = \frac{Team_i 2ndHalfFouls}{Total 2ndHalfFouls}$$

$$GameTotal = \frac{Team_i GameFouls}{TotalGameFouls}$$

$$1sthalf = \alpha + \beta_1 BT + \beta_2 BO + \beta_3 TO + \beta_4 split + \beta_5 year06 + \beta_6 rpi\_diff + \beta_7 home + \beta_8 ctourg + \beta_9 acc + \beta_{10} big\_east + \beta_{11} big\_12 + \beta_{12} big\_10 + \beta_{13} sec$$

$$2ndhalf = \alpha + \beta_1 BT + \beta_2 BO + \beta_3 TO + \beta_4 split + \beta_5 year06 + \beta_6 rpi\_diff + \beta_7 home + \beta_8 ctourg + \beta_9 acc + \beta_{10} big\_east + \beta_{11} big\_12 + \beta_{12} big\_10 + \beta_{13} sec$$

$$GameTotal = \alpha + \beta_1 BT + \beta_2 BO + \beta_3 TO + \beta_4 split + \beta_5 year06 + \beta_6 rpi\_diff + \beta_7 home + \beta_8 ctourg + \beta_9 acc + \beta_{10} big\_east + \beta_{11} big\_12 + \beta_{12} big\_10 + \beta_{13} sec$$

Ideally, the model would also account for other ways officials can effect the game such as calling “lane violation,” “traveling,” “palming,” or “double dribble” causing a change in possession. Unfortunately when this happens, it is recorded as a turnover in the statistics along with events like stepping out of bounds, an errant pass out of bounds, or a shot clock violation. Because I am unable to distinguish between player error and calls by the officials this data is not included and I focus on fouls.

The classifications of teams and the three separate regressions specifications are as follows. Teams must have a winning record overall and within the conference to be considered a “tournament” team. Teams had to have a winning record overall and either a winning, even, or one loss below even record within the conference to be considered a “bubble” team depending on the number of “bubble” teams needed for the specifications. Teams with a losing record overall and within the conference are considered “Out.” The data was then modified to vary the number of teams that qualified as bubble teams. One Bubble Team: It is the last team to be selected to the tournament from each conference. Two Bubble Teams: It is the last team to be selected to the tournament and the next

closest by record not selected. Three Bubble Teams: It is the last team to be selected to the tournament and the two next closest by record not selected. Variable summaries for each set are listed in Table [A.1], [A.2], and [A.3] in Appendix A.

6.4 Empirical Results and Conclusions

The results are listed in Tables [A.4], [A.5], and [A.6] in Appendix A. The regression based on the first half of games is the most interesting, Table [A.4]. The second half and therefore the total game results are of less interest because of the nature of basketball. In basketball, game strategy regularly includes fouling the other team intentionally to stop the clock and to regain possession of the ball. This occurs near the end of the game and not in the first half. The strategy of fouling another player would distort any evidence of proactive officials in the second half. In addition, more questionable calls in the second half would be more closely scrutinized than if they occurred in the first half.

Examining the first half regressions, Table [A.4], the variables of interest are the interaction terms. BT is the interaction term for games between teams designated "Bubble" and "Tournament." BO is the interaction term for games between teams designated "Bubble" and "Out." TO is the interaction term for games between teams designated "Tournament" and "Out." All three interaction term effects are small, which is expected, because large effects would result from noticeable favoritism during the game, and again, the referees will only be able to assist teams in certain situations during the game. The strongest support actively participating referees would have been is if all three had been negative and significant. Those results would indicate favoritism toward teams

in situations benefiting the conference. Had BT been significant and positive while BO and TO negative and significant would suggest the regression was not accounting for the relative abilities of different teams. It would indicate more talented teams simply foul less, because the foul advantage would favor the bubble team when playing a weaker team and would go against them when playing a stronger team. There are several possible reasons BT was not negative or significant. It is likely because some part of team ability is affecting these results. The relative difference between bubble teams and tournament teams may not be as large as the relative difference between bubble and tournament when compared to teams considered out. The dynamics of determining which outcome benefits the conference would change on a weekly basis between these two types of teams at the end of the season, making it difficult to actually observe a consistent pattern for a particular team(s). In the final weeks of the basketball season, the actual classification could change as a result of the previous game while in this model, it remains the same. An exact interpretation of the regression results as to the reduction of fouls a team may receive is difficult with the current data. My best attempt to analyze the results is to present it in percentage terms. For example, when a bubble team plays a team unlikely to make the tournament, that team will receive 3.7 % less fouls all else constant.

A log model transforming the dependent variable and the RPI difference variable was run in addition to the OLS model. The RPI difference variable was scaled to remove the negative observations but keep the relative value the same. The results are reported in Tables [A.7], [A.8], and [A.9] of Appendix A. Some of the interaction variables were significant in this model as well. I am not concerned with the exact size of the effect as I

am with having a positive or negative effect where expected. I would not expect the size of the effect to be larger than what equates to several fouls within a game in either the log model or the previous OLS model because a greater effect would likely indicate an error rather than the evidence of referees' actions I am looking for.

Additional analysis done with this data is mentioned in the following. In both versions of the model, I tested for heteroscedasticity using the standard White test because of the possible variance associated with the difference in RPI ranking. It indicated the presences of heteroscedasticity, and the regression was repeated using robust standard errors. There was no change in the significance of the variables. I experimented with several other modifications made to the model and the regression analysis, but there were no conclusive results to reproduce. I included a squared RPI difference variable, but the interaction terms were no longer significant. In some instances, the sign changed to a positive effect though it was still statistically insignificant.

While not the focus, another interesting result was the effect on foul ratio when playing at home. There was a consistent negative effect on the foul ratio for the home team. This suggests the "home-court" advantage is not limited to familiar surroundings and a supportive fan base. The effect was highly significant and negative. The result was significant in the 1^{st}, 2^{nd}, and game total results. The idea a team receives favorable treatment at home in basketball as well as most other sports is not new. This may indicate referees can be swayed by the crowd. Again, this brings into question the supposed neutrality of officials. Another prospective research theory for that result is keeping the

local audience happy may encourage them to attend more games thereby increasing attendance revenues.

The final analysis I used was an attempt to separate the effect of playing at home and the classification of the teams that may both be present in the interaction terms. For example, if a bubble team is the away team playing a tournament team at the end of the season, I wanted to determine any distinguishable difference in foul calls depending on which team has home court. I propose assisting the bubble should occur at either place if the conference is interested in gaining additional seeds in the tournament, but would directly conflict the advantage of being at home. To do this, I separated the interactions terms depending home and away designation. Because some of the games in the data are conference tournament games which are played at a neutral sight, I also had separate interaction terms for those observations. The results are reported in Tables [A.10], [A.11], and [A.12] in Appendix A. There are only a few statistically significant results, so I can not provide in any definite support for my theory; however, after analyzing the data, there are still some points of interest that allow me to suggest the theory has some potential.

Again, I focus on the 1st half results reproduced in Table [A.10]. Looking at the first two terms (B_hT_a and B_aT_h), if I assume there is no bias toward specific teams, and assume I am picking up some team difference not accounted for in the RPI difference, then we should expect both to be positive because the bubble team is the relatively weaker team. Also, we should expect B_aT_h to have a larger effect than B_hT_a because in this case the tournament team has the home court advantage. However this is not the

result. There is a smaller positive increase in fouls when the bubble team is the away team. The two effects together should indicate a greater advantage to the home tournament team. Next, look at the interaction between bubble teams and out teams (B_hO_a and B_aO_h). All three models have a negative effect on the foul ratio when these two types of teams play, but the models including two and three bubble teams actually have the larger negative effect on the foul ratio for the bubble team when they are the away team. A statistically significant result here would be the strongest evidence to support my theory. With more observations for each of the interactions perhaps it would be possible to find such a result. There are some significant results when examining the tournament teams versus the out teams (T_hO_a and T_aO_h), though these are the least interesting because this situation is the least likely to require referee bias. The games played on neutral courts remove the home-court entanglement issue, but there are very few observations to infer anything from the results. Again the home-court effect is present and significant.

This is not the first paper to suggest basketball referees favor the home team and as cited in the previous research, basketball is not the only sport where a game official is not considered neutral. If it is reasonable to accept that a referee will respond to the noise of the home crowd during the game, then it is reasonable to believe officials would willingly bias the calls during a game in the interest of the conference. The analysis presented here no way provides certainty of referee bias, but does lend itself favorably to the theory that referees are involved in affecting the game under the direction of the controlling conference agents in attempt to increase revenues.

CHAPTER VII

CONCLUSION

The fit of the model is not astounding as shown in the initial regression R-squared values regardless of regression parameters, but some significant results with the limited data set are encouraging. The strength of my conclusions is limited in quality to the data, but with more research it would be possible to provide further evidence of actions that seem completely rational in the theoretical sense.

If attainable in the future, a more extensive data set would naturally provide a stronger base to test the theory of proactive officials. At least five or more seasons would allow enough observations to include fixed effects for each season and individual team effects. The teams considered “bubble” teams will differ by the season, but specific team effects are needed because the style of each team’s play would most likely affect fouls called which should remain constant across seasons, possibly only changing under a new head coach. A model account for these additional differences between teams would give the model more predictive ability.

The initial assumption that any observable behavior would be seen in the last quarter of the season may likely be in error. The effect on foul calls was significant through the entire data set and not just the last quarter of the season. With a more extensive data set, I could compare the second half of intra-conference play to first half as the control group. If there are no significant results from the first half of conference play on fouls while the results from the second half remain significant, then it would provide strong support of attempted manipulation by conference officials. It is possible that the

last quarter is too long of a period. With more seasons available, I could test one, two, or the just the last three games of the season more effectively. This might be the more likely scenario because there is more information available about the likelihood of the teams for a respected conference that have a chance at being invited to the tournament. This makes the marginal value of each game greater as the final game approaches.

My analysis did account for the teams being members of different conferences, but more research is needed because the conferences do not share revenues in the same manner. As an example, I would likely expect this behavior first in the Atlantic Coast Conference where revenues are shared equally among the members as opposed to the Big East Conference where revenue distribution is weighed more toward performance. How exactly to incorporate different payout structures will be left for future endeavors on this subject.

Another potentially interesting theory to explain the formation of conferences separate from this research, though in no way contradictory, is the idea that a conference is a means to diversify risk. Not only does the joint-venture nature of conferences potentially increase revenues, it can also be a type of insurance against large variations in the revenues generated from the major college sports. If we assume the costs of operating a competitive athletic department are relatively constant from year to year, or at least grow at an expected rate, then universities may prefer a more constant stream of revenues that join a conference may provide. In the same manner as insurance plans protect against large loses, joining a conference may reduce variations in revenue associated with the athletic teams performance.

After examining the data, evidence of a relationship, however slight, may exist between the foul ratio and relative standing within the conference. Controlling for talent and venue, if a university is an independent firm competing against the other 330 teams, the foul distribution in basketball games will not favor certain teams within a group. If groups of these competing universities associate as a joint venture in the form of an athletic conference, then the individual school no longer has the incentive to behave in the manner we expect from a single firm. Instead, we will see actions that benefit the conference, and in turn, the monetary benefits to the member universities increase when compared to the university as a single entity. Officials actively involved in basketball games near the end of the season would benefit the conference. College basketball is a multimillion dollar enterprise with participants heavily invested in securing their portion, so referees who are conference employees, acting to this end is rational behavior.

Do I think there are set procedure in place for referees handed down by conference officials to help certain teams when possible? I hardly doubt it. However, what is expected may never be stated explicitly. I do not have any indication as to the exact method the conference manager could use to encourage behavior that clearly violates the role of the game official. I do think referees are like everyone else and will respond to the right incentives, such as calling more tournament games or promotions within the conference. It is possible there is nothing suspect happening in the world of college sports. Perhaps this paper is just a reflection of my skeptical nature, but as one of my advisors to this project said and like many fans of college basketball would echo, “Officiating this bad, can’t be by accident!”

APPENDICES

Appendix A

Regression Data and Other Additional Information

Table A.0 Multinomial Logistic Regression

Number of obs = 768
LR chi2(4) = 417.83
Prob > chi2 = 0.0000
Log likelihood = -789.21504 Pseudo R2 = 0.2093

Units	Coef.	Std. Err.	z	P>|z|	95% Conf.Interval	
2						
seed	-0.29635	0.02717	-10.91	0.00	-0.3496038	-0.2431
cons	2.012776	0.255274	7.88	0.00	1.512449	2.513104
3						
seed	-0.38193	0.036811	-10.38	0.00	-0.4540765	-0.30978
cons	1.857764	0.296365	6.27	0.00	1.2769	2.438629
4						
seed	-0.55355	0.06016	-9.2	0.00	-0.6714642	-0.43564
cons	1.99626	0.357576	5.58	0.00	1.295423	2.697097
5						
seed	-0.90728	0.098817	-9.18	0.00	-1.100957	-0.7136
cons	3.101244	0.381826	8.12	0.00	2.352878	3.84961

(Outcome units==1 is the comparison group)

Table A.1 One Bubble Team

Variables	Obs.	Mean	Std. Dev.	Min	Max	Description
1st Half R	611	0.487	0.100	0.143	0.762	$Team_i$ 1st Half Fouls / 1st Half Foul Total
2nd Half R	611	0.489	0.102	0.167	0.875	$Team_i$ 2nd Half Fouls / 2nd Half Foul Total
Game Total R	612	0.488	0.075	0.238	0.711	$Team_i$ Game Fouls / Game Total Foul Total
Log 1st Half R	611	-0.742	0.222	-1.946	-0.272	Log $Team_i$ 1st Half Fouls / 1st Half Foul Total
Log 2nd Half R	611	-0.740	0.224	-1.792	-0.134	Log $Team_i$ 2nd Half Fouls / 2nd Half Foul Total
LogGameTotalR	612	-0.730	0.158	-1.435	-0.342	Log $Team_i$ Game Fouls / Game Total Foul Total
BT	612	0.069	0.253	0	1	Interaction term between $Team_i$ "bubble" and Opponent "tournt"
BO	612	0.095	0.293	0	1	Interaction term between $Team_i$ "bubble" and Opponent "out"
TO	612	0.355	0.479	0	1	Interaction term between $Team_i$ "tournt" and Opponent "out"
Split	612	0.472	0.500	0	1	Last two weeks of regular season and tour. games dummy var.
Year06	612	0.464	0.499	0	1	2006 season dummy var.
RPI_diff	612	-43.203	72.857	-278	198	$Team_i$ RPI minus opponet RPI
Logrpi_dif	612	5.393	0.454	0	6.168	Log of ($Team_i$ RPI minus opponet RPI)
Home	612	0.415	0.493	0	1	Game play at $Team_i$ home court dummy var.
Ctourg	612	0.178	0.383	0	1	Conference tournament game dummy var.
ACC	612	0.163	0.370	0	1	Conference dummy variable
Bigeast	612	0.198	0.399	0	1	Conference dummy variable
Big12	612	0.172	0.377	0	1	Conference dummy variable
Big10	612	0.170	0.376	0	1	Conference dummy variable
SEC	612	0.162	0.369	0	1	Conference dummy variable
PAC10	612	0.136	0.343	0	1	Default conference

Table A.2 Two Bubble Teams

Variables	Obs.	Mean	Std. Dev.	Min	Max	Description
1st Half R	611	0.488	0.100	0.143	0.762	$Team_i$ 1st Half Fouls / 1st Half Foul Total
2nd Half R	611	0.487	0.102	0.167	0.875	$Team_i$ 2nd Half Fouls / 2nd Half Foul Total
Game Total R	612	0.487	0.075	0.238	0.711	$Team_i$ Game Fouls / Game Total Foul Total
Log 1st Half R	611	-0.741	0.222	-1.946	-0.272	Log $Team_i$ 1st Half Fouls / 1st Half Foul Total
Log 2nd Half R	611	-0.743	0.224	-1.792	-0.134	Log $Team_i$ 2nd Half Fouls / 2nd Half Foul Total
LogGameTotalR	612	-0.731	0.158	-1.435	-0.342	Log $Team_i$ Game Fouls / Game Total Foul Total
BT	612	0.145	0.353	0	1	Interaction term between $Team_i$ "bubble" and Opponent "tournt"
BO	612	0.157	0.364	0	1	Interaction term between $Team_i$ "bubble" and Opponent "out"
TO	612	0.328	0.470	0	1	Interaction term between $Team_i$ "tournt" and Opponent "out"
Split	612	0.472	0.500	0	1	Last two weeks of regular season and tour. games dummy var.
Year06	612	0.464	0.499	0	1	2006 season dummy var.
RPI_diff	612	-43.203	72.857	-278	198	$Team_i$ RPI minus opponet RPI
Logrpi_dif	612	5.393	0.454	0	6.168	Log of ($Team_i$ RPI minus opponet RPI)
Home	612	0.415	0.493	0	1	Game play at $Team_i$ home court dummy var.
Ctourg	612	0.178	0.383	0	1	Conference tournament game dummy var.
ACC	612	0.163	0.370	0	1	Conference dummy variable
Bigeast	612	0.198	0.399	0	1	Conference dummy variable
Big12	612	0.172	0.377	0	1	Conference dummy variable
Big10	612	0.170	0.376	0	1	Conference dummy variable
SEC	612	0.162	0.369	0	1	Conference dummy variable
PAC10	612	0.136	0.343	0	1	Default conference

Table A.3 Three Bubble Teams

Variables	Obs.	Mean	Std. Dev.	Min	Max	Description
1st Half R	611	0.488	0.100	0.143	0.762	$Team_i$ 1st Half Fouls / 1st Half Foul Total
2nd Half R	611	0.489	0.102	0.167	0.875	$Team_i$ 2nd Half Fouls / 2nd Half Foul Total
Game Total R	612	0.488	0.075	0.273	0.762	$Team_i$ Game Fouls / Game Total Foul Total
Log 1st Half R	611	-0.741	0.222	-1.946	-0.272	Log $Team_i$ 1st Half Fouls / 1st Half Foul Total
Log 2nd Half R	611	-0.739	0.223	-1.792	-0.134	Log $Team_i$ 2nd Half Fouls / 2nd Half Foul Total
LogGameTotalR	612	-0.729	0.157	-1.299	-0.272	Log $Team_i$ Game Fouls / Game Total Foul Total
BT	612	0.204	0.403	0	1	Interaction term between $Team_i$ "bubble" and Opponent "tournt"
BO	612	0.221	0.415	0	1	Interaction term between $Team_i$ "bubble" and Opponent "out"
TO	612	0.275	0.447	0	1	Interaction term between $Team_i$ "tournt" and Opponent "out"
Split	612	0.472	0.500	0	1	Last two weeks of regular season and tour. games dummy var.
Year06	612	0.464	0.499	0	1	2006 season dummy var.
RPI_diff	612	-43.203	72.857	-278	198	$Team_i$ RPI minus opponet RPI
Logrpi_dif	612	5.407	0.460	0	6.168	Log of ($Team_i$ RPI minus opponet RPI)
Home	612	0.415	0.493	0	1	Game play at $Team_i$ home court dummy var.
Ctourg	612	0.178	0.383	0	1	Conference tournament game dummy var.
ACC	612	0.163	0.370	0	1	Conference dummy variable
Bigeast	612	0.198	0.399	0	1	Conference dummy variable
Big12	612	0.172	0.377	0	1	Conference dummy variable
Big10	612	0.170	0.376	0	1	Conference dummy variable
SEC	612	0.162	0.369	0	1	Conference dummy variable
PAC10	612	0.136	0.343	0	1	Default conference

Table A.4 Effects on 1st Half Foul Ratio

	One Bubble Team		Two Bubble Teams		Three Bubble Teams	
BT	0.0170	0.0167	0.0145	0.0144	0.0111	0.0115
BO	-0.0370*	-0.0363*	-0.0219	-0.0217	-0.0274*	-0.0277*
TO	-0.0341**	-0.0339**	-0.0364**	-0.0362**	-0.0398**	-0.0400**
Split	0.0009		-0.0019		-0.0027	
Year06	0.0110	0.0010	0.0070	-0.0020	0.0101	-0.0029
RPI_diff	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Home	-0.0700***	-0.0701***	0.0704***	0.0704***	-0.0705***	-0.0704***
Ctourg	-0.0436***	-0.0366***	-0.0335**	-0.0289**	-0.0460***	-0.0393***
Acc	-0.0145	-0.0145	-0.0105	-0.0105	0.0044	0.0045
Big_east	0.0058	0.0057	0.0105	0.0105	0.0236	0.0236
Big_12	-0.0002	0.0002	0.0062	0.0065	0.0110	0.0115
Big_10	0.0025	0.0025	0.0072	0.0073	0.0151	0.0151
Sec	-0.0245	-0.0236	-0.0152	-0.0150	-0.0011	-0.0007
Constant	0.5355***	0.5392***	0.5309***	0.5332***	0.5233***	0.5267***
Rsquared	0.1413	0.139	0.1389	0.138	0.1375	0.1356

* p<0.05; ** p<0.01; ***p<0.001

Table A.5 Effects on 2nd Half Foul Ratio

	One Bubble Team		Two Bubble Teams		Three Bubble Teams	
BT	0.0106	0.0111	0.0056	0.0058	0.0072	0.0065
BO	0.0020	0.0008	0.0051	0.0048	-0.0040	-0.0035
TO	-0.0136	-0.0138	-0.0166	-0.0170	-0.0325*	-0.0323*
Split	-0.0076		-0.0125		-0.0124	
Year06	-0.0173	-0.0077	-0.0148	-0.0122	-0.0176	-0.0122
RPI_diff	0.0002*	0.0001*	0.0001	0.0001	0.0001	0.0001
Home	-0.0490***	-0.0488***	-0.0474***	-0.0475***	-0.0493***	-0.0494***
Ctourg	0.0080	-0.0031	0.0063	-0.0035	0.0054	-0.0062
Acc	0.0006	0.0007	-0.0073	-0.0074	0.0013	0.0012
Big_east	-0.0126	-0.0126	-0.0128	-0.0128	-0.0121	-0.0121
Big_12	0.0170	0.0165	0.0122	0.0116	0.0086	0.0079
Big_10	0.0292*	0.0291*	0.0258	0.0256	0.0242	0.0241
Sec	-0.0014	-0.0029	-0.0034	-0.0040	-0.0004	-0.0011
Constant	0.5257***	0.5199***	0.5264***	0.5215***	0.5308***	0.5250***
Rsquared	0.1122	0.1068	0.1065	0.1026	0.1145	0.1091

* p<0.05; ** p<0.01; ***p<0.001

Table A.6 Effects on Game Total Foul Ratio

	One Bubble Team		Two Bubble Teams		Three Bubble Teams	
BT	0.0120	0.0121	0.0102	0.0102	0.0091	0.0089
BO	-0.0149	-0.0151	-0.0040	-0.0041	-0.0120	-0.0119
TO	-0.0222**	-0.0222**	-0.0230**	-0.0232**	-0.0340***	-0.0339***
Split	-0.0036		-0.0076		-0.0080	
Year06	-0.0037	-0.0036	-0.0041	-0.0075	-0.0044	-0.0080
RPI_diff	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000
Home	-0.0589***	-0.0589***	-0.0584***	-0.0584***	-0.0594***	-0.0594***
Ctourg	-0.0177*	-0.0201**	-0.0142	-0.0169*	-0.0205*	-0.0234**
Acc	-0.0059	-0.0059	-0.0087	-0.0087	0.0026	0.0026
Big_east	-0.0041	-0.0041	-0.0019	-0.0019	0.0044	0.0044
Big_12	0.0105	0.0104	0.0103	0.0101	0.0108	0.0106
Big_10	0.0206*	0.0206*	0.0209*	0.0209*	0.0237*	0.0237*
Sec	-0.0105	-0.0108	-0.0071	-0.0072	0.0010	0.0008
Constant	0.5295***	0.5283***	0.5269***	0.5256***	0.5262***	0.5248***
Rsquared	0.2036	0.2032	0.2034	0.2029	0.2047	0.204

* p<0.05; ** p<0.01; ***p<0.001

Table A.7 Effects on 1st Half Foul Ratio (Log)

	One Bubble Team	Two Bubble Teams	Three Bubble Teams
BT	0.0379	0.0409	0.0285
BO	-0.0920*	-0.0443	-0.0588*
TO	-0.0890***	-0.0878***	-0.0963***
Year06	0.0114	0.0032	0.0012
Log(RPI_diff)	-0.0402*	-0.0438*	-0.0503**
Home	-0.1500***	-0.1511***	-0.1498***
Ctourg	-0.0696***	-0.0514*	-0.0731***
Acc	-0.0148	-0.0047	0.0258
Big_east	0.0166	0.0276	0.0544
Big_12	0.0070	0.0204	0.0299
Big_10	0.0059	0.0156	0.0326
Sec	-0.0486	-0.0307	-0.0009
Constant	-0.4126***	-0.4094***	-0.3856***
R-squared	.1390	.1376	.1339

* p<0.05; ** p<0.01; ***p<0.001

Table A.8 Effects on 2nd Half Foul Ratio (Log)

	One Bubble Team	Two Bubble Teams	Three Bubble Teams
BT	0.0325	0.0192	0.0207
BO	-0.0086	-0.0028	-0.0151
TO	-0.0498*	-0.0590*	-0.0870**
Year06	-0.0167	-0.0261	-0.0256
Log(RPI_diff)	0.0329	0.0231	0.0085
Home	-0.1068***	-0.1039***	-0.1063***
Ctourg	-0.0084	-0.0078	-0.0120
Acc	0.0163	0.0013	0.0189
Big_east	-0.0224	-0.0226	-0.0213
Big_12	0.0476	0.0386	0.0290
Big_10	0.0662	0.0589	0.0557
Sec	-0.0044	-0.0061	0.0001
Constant	-0.8638***	-0.8052***	-0.7170***
R-squared	.1018	.0989	.1080

* p<0.05; ** p<0.01; ***p<0.001

Table A.9 Effects on Game Total Foul Ratio (Log)

	One Bubble Team	Two Bubble Teams	Three Bubble Teams
BT	0.0310	0.0302	0.0256
BO	-0.0440*	-0.0146	-0.0282
TO	-0.0655***	-0.0663***	-0.0848***
Year06	-0.0050	-0.0137	-0.0144
Log(RPI_diff)	0.0029	-0.0025	-0.0128
Home	-0.1250***	-0.1237***	-0.1245***
Ctourg	-0.0405**	-0.0324*	-0.0449**
Acc	-0.0069	-0.0109	0.0116
Big_east	-0.0096	-0.0045	0.0083
Big_12	0.0252	0.0256	0.0247
Big_10	0.0401	0.0409	0.0465*
Sec	-0.0263	-0.0184	-0.0021
Constant	-0.6625***	-0.6401***	-0.5838***
R-squared	.2030	.2043	.2084

* p<0.05; ** p<0.01; ***p<0.001

Table A.10 Effects on 1st Half Foul Ratio (Home, Away, Neutral)

	One Bubble Team	Two Bubble Teams	Three Bubble Teams
BhTa	0.0286	0.0263	0.0288
BaTh	0.0123	0.0066	0.0073
BhOa	-0.0446*	-0.0228	-0.0183
BaOh	-0.0280	-0.0235	-0.0314
ThOa	-0.0450**	-0.0428**	-0.0471*
TaOh	-0.0140	-0.0222	-0.0202
BTn	-0.0009	0.0045	-0.0176
BOn	-0.0200	-0.0149	-0.0337
TOn	-0.0399*	-0.0450*	-0.0617**
Year06	0.0014	-0.0027	-0.0032
RPI_diff	-0.0000	-0.0001	-0.0001
Home	-0.0570***	-0.0659***	-0.0695***
Ctourg	-0.0218	-0.0213	-0.0223
Acc	-0.0138	-0.0090	0.0059
Big_east	0.0044	0.0101	0.0232
Big_12	0.0001	0.0075	0.0121
Big_10	0.0021	0.0081	0.0157
Sec	-0.0214	-0.0140	0.0001
Constant	0.5307***	0.5293***	0.5219***

* p<0.05; ** p<0.01; ***p<0.001

Table A.11 Effects on 2nd Half Foul Ratio (Home, Away, Neutral)

	One Bubble Team	Two Bubble Teams	Three Bubble Teams
BhTa	-0.0034	-0.0077	0.0127
BaTh	0.0153	0.0171	0.0148
BhOa	0.0082	0.0365	0.0385*
BaOh	-0.0216	-0.0462*	-0.0428*
ThOa	-0.0049	-0.0063	-0.0106
TaOh	-0.0348*	-0.0462**	-0.0671***
BTn	0.0326	0.0060	-0.0130
BOn	0.0371	0.0346	-0.0202
TOn	0.0013	0.0034	-0.0261
Year06	-0.0057	-0.0100	-0.0106
RPI_diff	0.0002*	0.0001	0.0001
Home	-0.0621***	-0.0714***	-0.0840***
Ctourg	-0.0228	-0.0351*	-0.0202
Acc	0.0006	-0.0066	0.0036
Big_east	-0.0132	-0.0155	-0.0131
Big_12	0.0171	0.0107	0.0096
Big_10	0.0305*	0.0272	0.0261
Sec	-0.0014	-0.0036	0.0022
Constant	0.5282***	0.5372***	0.5397***

* p<0.05; ** p<0.01; ***p<0.001

Table A.12 Effects on Game Total Foul Ratio (Home, Away, Neutral)

	One Bubble Team	Two Bubble Teams	Three Bubble Teams
BhTa	0.0108	0.0101	0.0221
BaTh	0.0110	0.0116	0.0096
BhOa	-0.0126	0.0122	0.0157
BaOh	-0.0260	-0.0325*	-0.0360**
ThOa	-0.0209	-0.0187	-0.0226
TaOh	-0.0257*	-0.0339**	-0.0465***
BTn	0.0161	0.0042	-0.0149
BOn	0.0122	0.0164	-0.0230
TOn	-0.0180	-0.0172	-0.0414*
Year06	-0.0022	-0.0066	-0.0072
RPI_diff	0.0001	0.0001	0.0000
Home	-0.0621***	-0.0708***	-0.0807***
Ctourg	-0.0247*	-0.0309*	-0.0246
Acc	-0.0056	-0.0080	0.0043
Big_east	-0.0050	-0.0038	0.0036
Big_12	0.0107	0.0098	0.0116
Big_10	0.0212*	0.0219*	0.0249*
Sec	-0.0087	-0.0068	0.0027
Constant	0.5298***	0.5332***	0.5321***

* p<0.05; ** p<0.01; ***p<0.001

Table A.13 Additional Complete NCAA Payout for All Conferences
Division I Basketball Fund

CONFERENCE	2000-01	2001-02	2002-03	2003-04	2004-05
America East	658,602	704,698	784,182	845,783	912,225
Atlantic 10	3,951,613	4,429,530	4,705,094	4,369,880	5,017,235
Atlantic Coast	7,056,452	7,550,336	9,802,279	9,867,470	11,250,770
Atlantic Sun	658,602	805,369	1,045,576	986,747	1,064,262
Big 12	6,586,021	6,442,953	9,148,794	10,854,217	12,923,182
Big East	6,868,279	7,348,993	9,018,096	10,431,326	11,858,920
Big Sky	752,688	704,698	914,879	986,747	1,064,262
Big South	470,430	604,027	784,182	845,783	912,225
Big Ten	7,338,710	8,859,060	12,285,523	13,250,603	13,379,294
Big West	564,516	704,698	914,879	986,747	1,216,299
Colonial	752,688	704,698	1,045,576	1,127,711	1,064,262
Conference USA	4,422,043	4,127,517	4,574,397	4,933,735	6,081,497
Horizon League	1,129,032	1,208,054	1,437,668	1,973,494	1,672,412
Independents	0	0	0	0	0
Ivy Group	752,688	805,369	914,879	986,747	912,225
Metro Atlantic	752,688	604,027	784,182	845,783	1,064,262
Mid-American	1,317,204	1,308,725	1,960,456	2,255,422	2,128,524
Mid-Continent	658,602	805,369	1,045,576	1,127,711	912,225
Mid-Eastern	658,602	805,369	1,045,576	986,747	1,064,262
Missouri Valley	1,599,462	1,610,738	2,483,244	2,819,277	3,040,749
Mountain West	282,258	402,685	1,045,576	1,691,566	2,280,561
Northeast	564,516	604,027	784,182	845,783	912,225
Ohio Valley	564,516	604,027	784,182	845,783	912,225
Pacific-10	5,927,419	6,845,638	9,932,976	10,008,434	9,122,246
Southeastern	7,715,054	7,852,349	9,540,885	10,713,253	12,010,957
Southern	752,688	805,369	1,045,576	845,783	912,225
Southland	564,516	604,027	784,182	845,783	912,225
Southwestern	564,516	604,027	784,182	845,783	912,225
Sun Belt	658,602	604,027	784,182	845,783	912,225
The Patriot League	564,516	604,027	784,182	845,783	912,225
West Coast	1,505,376	1,711,409	2,091,153	2,537,349	2,888,711
Western	3,387,097	3,624,161	4,443,700	3,946,988	3,496,861
TOTAL	**$69,999,996**	**$75,000,001**	**$97,499,996**	**$105,300,001**	**$113,724,003**

Table A.14 Additional Complete NCAA Units for All Conferences Distribution of Basketball-Related Funds According to Number of Units

Conferences	2000	2001	2002	2003	2004	2005	Total Units	Projected Distribution
America East Conf.	1	1	1	1	1	2	7	$1,147,869
Atlantic 10 Conf.	4	7	2	4	10	1	28	$4,591,477
Atlantic Coast Conf.	10	15	12	9	19	15	80	$13,118,505
Atlantic Sun	1	2	1	1	1	1	7	$1,147,869
Big 12 Conf.	15	9	19	19	14	12	88	$14,430,355
Big East Conf.	13	10	12	14	16	13	78	$12,790,542
Big Sky Conf.	1	1	1	1	1	1	6	$983,888
Big South Conf.	1	1	1	1	1	1	6	$983,888
Big Ten Conf.	19	17	13	13	6	16	84	$13,774,430
Big West Conf.	1	2	1	1	2	3	10	$1,639,813
Colonial Athletic Assoc.	1	1	2	1	1	1	7	$1,147,869
Conference USA	5	5	4	9	11	10	44	$7,215,178
Horizon League	1	2	1	4	1	3	12	$1,967,776
Ivy Group	1	1	1	1	1	1	6	$983,888
Metro Atlantic Ath. Conf.	1	1	1	1	2	1	7	$1,147,869
Mid-American Conf.	1	2	4	2	1	1	11	$1,803,794
Mid-Continent Conf.	1	1	1	1	1	1	6	$983,888
Mid-Eastern Athletic	1	2	1	1	1	1	7	$1,147,869
Missouri Valley Conf.	2	3	5	2	2	4	18	$2,951,664
Mountain West	3	1	4	4	3	4	19	$3,115,645
Northeast Conf.	1	1	1	1	1	1	6	$983,888
Ohio Valley Conf.	1	1	1	1	1	1	6	$983,888
Pacific-10 Conf.	8	17	15	11	4	9	64	$10,494,804
Southeastern Conf.	16	11	11	12	13	10	73	$11,970,636
Southern Conf.	1	1	1	1	1	1	6	$983,888
Southland Conf.	1	1	1	1	1	1	6	$983,888
Southwestern Athl. Conf.	1	1	1	1	1	1	6	$983,888
Sun Belt Conf.	1	1	1	1	1	1	6	$983,888
The Patriot League	1	1	1	1	1	2	7	$1,147,869
West Coast Conf.	5	3	2	3	2	3	18	$2,951,664
Western Athletic Conf.	5	3	3	2	4	3	20	$3,279,626
GRAND TOTALS:	124	125	125	125	125	125	749	$122,822,000
							Amount per unit:	$163,981

Appendix B

Experimental Data

Included as a supplemental file

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