Determinants of men's college basketball profit

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ABSTRACT

This paper presents empirical results investigating the determinants of men's college basketball profit. The research sample is 217 college basketball programs from the 2007 season. Significant determinants of men's college basketball profits are Division I-A status in football, amount of student financial aid to athletics, size of the institution, recruiting expenses spent on male athletes, head coach compensation, and rating percentage index ranking of the team. Model results imply profitability of the overall athletic program at an institution, percent of student athlete financial support allocated to women, public institutions, number of female athletes at an institution, and compensation of assistant coaches are not significant determinants of men's college basketball profits.

Keywords: Coach Compensation, College Athletics, College Basketball, College Recruiting, Sports Profit, Title IX
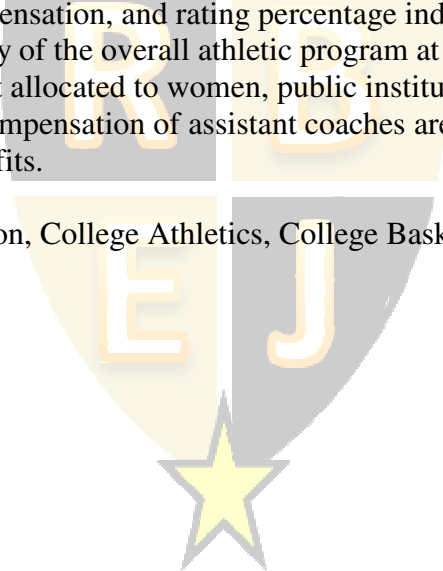
INTRODUCTION

Universities receive their non-profit status thanks to their role of educating students but the business aspect of college sports continues to grow and expand. Critics of college sports cite the revenue generated by athletics as evidence of their commercial nature. Supporters counter by stating the overall goal of athletics is not to turn a profit but to provide financial support to student athletes and increase the university's national profile (McEvoy, 2005; Smith, 2008). Proponents of major college athletics highlight the positive externalities associated with the alumni relationships, corporate relationships, and institutional branding produced by successful athletic programs (Smith, 2008).

Men's college basketball, along with football, is normally a revenue-generating program for most college athletic programs. The University of Texas leads collegiate athletic programs with over $120 million a year in revenue generation, which includes over $67 million generated by the football program and over $14.5 million generated by the men's basketball program. The purpose of this research is to investigate the determinants of men's college basketball profits. The organization of the manuscript is as follows: The first section offers a brief review of the literature. The second section describes the data and model. The next section offers empirical results for the determinants of men's college basketball profits derived from 217 college athletic programs. The final section offers a summary and conclusions.

SURVEY OF THE LITERATURE

There is a dearth of research on profitability of men's college basketball but numerous studies have explored a wide range of related college athletic issues. Terry, Pjesky, and Kelley (2010) find that significant and positive determinants of college football profits are profitability of the overall athletic program, size of the institution measured by the number of undergraduate students, recruiting budget of the athletic program, association with a conference that is part of the Bowl Championship Series (BCS), compensation of assistant coaches, and number of football wins during the season. The empirical results indicate classification as a Division I-A football program without membership in a BCS conference and numbers of female athletes at an institution are negative and have a statistically significant impact on football profitability. The authors find head coach salary is not a statistically significant determinant of college football profits.

Compensation of college coaches can have a significant impact on the performance of an athletic program. Terry, Pjesky, and Rider (2009) conclude the significant determinants of head coaches pay for college basketball are profitability of the athletic program, recruitment budget, percentage of the recruitment budget allocated to women's sports, compensation of assistant coaches, number of female athletes at the institution, and number of sports supported by the athletic program. The Equal Employment Opportunity Commission (EEOC) has ruled all collegiate coaching jobs are equal. All coaches at all levels perform certain functions including teaching/training, counseling/advising student athletes, general program management, budget management, fundraising, public relations, and recruiting at the college level. Labor market theories suggest similar individuals who do the same job with the same support should earn similar salaries. Brown and Jepsen (2009) find this to be true among major league baseball players. Players with higher offensive statistics (productivity) did receive higher salaries. Idson and Kahane (2000) find that having productive teammates enhances productivity and

compensation. Kahn (2006) finds that African-American coaches are not victims of discrimination in wage, hiring, or firing in the NBA. Humphreys (2000) reports that male head coaches of women's basketball teams earn less than do female head coaches of women's basketball teams.

Baade, Baumann, and Matheson (2008) examine the economic impact of college football on the local economy. The research focuses on 63 metropolitan areas that played host to major college football with a research sample from 1970 through 2004. Number of home games played, winning percentage of local team, and winning a national championship are shown to have an insignificant impact on employment and personal income in the cities where the teams play. Lentz and Laband (2009) examine the economic impact of college athletics on employment in the restaurant and accommodations industries. They find a positive and statistically significant relationship between college athletics revenue and MSA employment in the food services and accommodations industries. Siegfried, Sanderson, and McHenry (2007) argue that the economic impact analyses developed by most college and universities tend to inflate the real economic impact.

The success of college athletic programs might have an indirect impact on an academic institution. Tucker (2005) finds a statistically significant impact for successful football teams on the quality of incoming freshman class, which provides evidence of a strong athletic advertising effect for football. Rishe (2003) finds that neither the graduation rate for student-athletes nor all other undergraduates are sensitive to the level of a school's athletic success. However, the graduation gap between student-athletes and all other undergraduates is sensitive to various measures of a school's athletic success. Women have higher graduation rates than men in general, and this gender graduation gap is exacerbated when focusing on student-athletes at schools with the most prominent football programs. Multiple studies find a positive correlation between athletic success and alumni giving rates (Rhoads & Gerking, 2000; Turner, Meserve & Bowen, 2001; Monks, 2003; Holmes, Meditz & Sommers, 2008). Rees and Schnepel (2009) find host communities register sharp increases for assaults, vandalism, and arrest for disorderly conduct on football game days. Upsets are associated with the largest increase in the number of expected offenses.

Title IX prohibits any type of gender discrimination in any educational programs or activities within an institution receiving federal financial assistance. The act applies to both public and private schools, from kindergarten through graduate school, and covers admission, recruitment, educational programs and activities, course offerings and access, counseling, financial aid, employment assistance, facilities and housing, health and insurance benefits and services, scholarships, and athletics. Title IX has been the most important measure ever undertaken to promote gender equality in sports (Leeds & Von Allen, 2002). From 1971-2002 the number of women in college sports increased fivefold. In fact, now there are more women's teams than men's teams: 9,479 to 9,149. The potential conflict with the expansion of women's athletics is the redistribution of football profits to female non-revenue generating sports at the expense of male non-revenue generating sports like wrestling and rugby (Terry & Ramirez, 2005).

The economics literature indicates that the size of a college could have a positive impact on program profitability. The labor economics literature has revealed the tendency for large firms to be more profitable and pay employees more than small firms (Lucas, 1978; Oi, 1983; Brown & Medoff, 1989; Fox, 2009). Absolute profits and profit rates both have a tendency toward positive correlation with size. Large state universities like the University of Texas,

University of Michigan, and University of Florida might have an innate advantage with respect to athletic program profitability based on their dominant size.

DATA AND MODEL

The NCAA regularly surveys member institutions to assess compliance with Title IX and other regulations. This study uses data from the 2007 Office of Postsecondary Education Equity in Athletics Disclosure website. The research cohort includes institutions from Division I-A or I-AA programs. After dropping institutions with missing observations, 217 Division I-A and Division I-AA institutions that offered men's college basketball remained. The explicit empirical model employed to investigate men's college basketball profit is specified as follows:

$$BPROFIT_i = B_0 + B_1APROFIT_i + B_2DIA_i + B_3AID_i + B_4AIDWOMEN_i + B_5STUDENTS_i + B_6PUBLIC_i + B_7FATHLETES_i + B_8RECRUIT_i + B_9COACH_i + B_{10}ASSISTANT_i + B_{11}RPI_i + u_i.$$

Table 1 presents summary statistics for model variables. The dependent variable BPROFIT measures men's college basketball profits (reported revenue minus cost) at the institution. Eighty-seven basketball teams in the research sample earned a profit of $1 million or greater. The University of Louisville, University of North Carolina, and University of Arizona are the three most profitable programs, with profits ranging from $11 million to over $17 million. Seventy-eight of the 217 men's basketball programs in the research cohort reported negative profits for the sample year.

The model includes eleven independent variables. The variable APROFIT controls for the profit of the overall athletic program at an institution. Notre Dame ($26.1 million), University of Michigan ($20.8 million), University of Texas ($15.7 million) and University of Florida ($15.6 million) are the four athletic programs in the sample reporting the highest profitability across the entire athletic program. The sample cohort includes 102 institutions reporting overall athletic profits of less than $100, although no institution in the sample reports a negative overall profit for the athletic program. The expected sign on APROFIT is positive. Profitable athletic programs have the ability to invest resources into the facilities and marketing of the men's basketball program.

The Division I-A (DIA) is a categorical variable separating Division I-A teams from Division I-AA teams. Football dominates college athletic profits and influences many of the other athletic programs (Terry, Pjesky, & Kelley, 2010). The NCAA adopted a three-division reorganization plan in August of 1973 (Zimbalist, 1999). Major college teams were placed in Division I and smaller institutions with limited scholarships were placed in Division II and Division III. In January of 1978, Division I was divided into Division I-A and Division I-AA for football only. Division I-AA schools are generally smaller athletic programs that can compete in basketball but might not be as competitive in football. Part of the equation is the size of the stadium and the amount of potential revenue generation (bigger stadium = more revenue, usually). Thus to play in Division I-A a team must play a certain number of games in a stadium that holds more than a specified number of people. In addition, scholarship support for student athletes differs from division to division. For example, Division I-A schools like Wake Forest and Duke are smaller than many Division I-AA schools but both institutions offer significant scholarship resources to student athletes. Programs in Division I-A are expected to have more resources and higher profitability than Division I-AA programs in all major sports, including

men's basketball. For example, institutions with football programs classified as Division I-A are more likely to have a large basketball arena with greater revenue-generating capacity.

Total aid to student athletes (AID) and percentage of student athletic aid distributed to women (AIDWOMEN) are two independent variables that should significantly influence women's basketball profitability. Total student aid could be a positive determinant of college athletic profits as greater financial support should attract better athletes and increase the prospects for fan support by winning. On the other hand, total financial support to student athletes is a cost that could lower program profitability. The AIDWOMEN variable is the percentage of student aid to athletes distributed to women. The expectation is for the variable to have a negative impact on men's college basketball profitability. An increase in the percentage allocation of financial support to women's athletics explicitly results in a reduced percentage allocation to men's sports.

The independent variables STUDENTS, PUBLIC, and FATHLETES are institutional control variables. The STUDENTS variable captures the size of the institution. The STUDENTS variable is a measure of the number of undergraduate students enrolled at the institution. The largest institution in the sample is Penn State with 36,612 undergraduate students, while the smallest institution in the research cohort is Davidson College with 1,678 students. The variable PUBLIC is a categorical variable controlling for public versus private institutions. Public institutions represent seventy-four percent of the institutions in the research sample. The variable FATHLETES measures the number of female student athletes at the institution. The University of Minnesota has the largest number of female athletes at 436. The number of female athletes at an institution is expected to have a negative impact on men's basketball profitability based on the assumption that female programs tend to be non-revenue generating and divert resources away from the traditional revenue generating sports like football and men's basketball.

The next three independent variables in the model are resource control variables. RECRUIT is the budget allocated to the athletic department to recruit male student athletes. The University of Tennessee, University of Notre Dame, University of Florida, and Kansas State University are four schools with male sports recruiting budgets in excess of $1 million. The smallest reported recruiting budget for male athletes is $19,000 at Prairie View A&M University. Recruiting budget should have a positive impact on the profitability of football programs based on the assumption larger recruiting budgets help support the recruitment of blue chip athletes, which has a positive impact on fan support. The average pay of head coaches in male sports at the institution defines the variable COACH. The COACH variable serves as a proxy for pay of head coach for men's basketball, which should be highly correlated with average head coach pay at an institution. The University of Texas and University of Kansas lead the way with average head coach salaries of $903,890 and $748,953, respectively. Saint Peters College offers the lowest average head coach salary at $16,674. The variable ASSISTANT is the final resource variable in the model and accounts for the average pay of assistant coaches in male sports. The University of Alabama men's teams have the highest paid assistant coaches at $182,779, while California State University at Sacramento offers the lowest average pay for assistant coaches at $10,748. The expectation is for both head coach and assistant coach pay to have a positive impact on basketball profitability as men's basketball programs with potential for profits seek coaching staffs that can help realize potential.

The final variable is RPI, which ranks teams based on a combination of a team's wins and losses relative to strength of schedule. It is one of the systems for ranking NCAA basketball

teams. This system has been in use since 1981 to aid in the selecting and seeding of teams appearing in the playoff tournament for a national championship. In its current formulation, the index comprises a team's winning percentage (25%), its opponents' winning percentage (50%), and the winning percentage of those opponents' opponents (25%). A lower RPI number represents a higher rating for a team (e.g., the best team earns a number 1 ranking and the second best team earns a number 2 ranking). The top rated RPI programs in the 2007 research sample are Ohio State University (RPI ranking of 1), University of California-Los Angeles (RPI ranking of 2), University of North Carolina (RPI ranking of 3), and University of Wisconsin (RPI ranking of 4). RPI should have an inverse relationship with men's basketball profits based on the best teams earning low RPI rank numbers.

RESULTS

Table 2 presents the estimated empirical relationship between the explanatory variables and profitability of men's college basketball programs. The ordinary least squares (OLS) model explains over 40 percent of the variance in men's college basketball profitability. Several independent variables have correlations higher than 0.65, which indicates that multicollinearity could be a problem in the analysis. The highest correlation is 0.79 between the variables COACH and ASSISTANT. In order to address the multicollinearity concern, a reduced model derived by employing a stepwise elimination process is offered in addition to the full model specification. Six of the eleven independent variables in the model are statistically significant in at least one of the model specifications.

The first variable in the model is APROFIT, which measures the impact of the profitability of the overall athletic program on men's college basketball profits, holding other variables constant. The APROFIT variable is negative but not statistically significant. The lack of a positive and statistically significant relationship between the overall athletic program at an institution and men's college basketball provides confirmation to the hypothesis that football is the key profit driver in collegiate athletics (Terry, Pjesky & Kelley, 2010). Men's basketball might be a sport that generates revenue on many campuses but it is usually a distant second to football. The Southeastern Conference (SEC) football programs lead the way in revenue generation, averaging over $45 million per football team per year. In contrast, the University of Louisville, with revenue generation of $23 million, is the only men's basketball program that was able to generate half the average football revenue of an SEC football program.

The DIA categorical variable is positive and statistically significant in the reduced model. The results confirm the hypothesis that institutions with the resources to compete at the Division I-A level in football tend to have a large basketball arena with greater revenue-generating capacity. It is also possible that high profile Division I-A football programs might complement men's college basketball programs. Exposure in one sport could have a positive impact on fans, donors, and recruits of the other sport. For example, it is common for a top basketball prospect to attend a home football game at an institution during an official campus visit or for a potential booster of the basketball program to receive an invitation to sit with the head basketball coach in the luxury box seating area at a football game.

Financial aid to student athletes has a significant impact on the profitability of men's college basketball programs. The total dollar amount of student aid to athletes (AID) has a positive impact on profitability. Increasing student aid to athletes appears to create a recruiting advantage in men's basketball, which increases the ability to attract top athletes and program

profitability. The percentage of the student aid allocated to female athletes (WOMENAID) has a positive but statistically insignificant impact on men's college basketball. Institutions that offer women's athletic programs support beyond the minimum requirements put forth by Title IX do not appear to harm the financial viability of the men's college basketball program.

One of the three institutional variables is statistically significant. Size of the institution measured by number of undergraduate students (STUDENTS) is a positive and statistically significant determinant of men's college basketball profits. A large university with more students tends to benefit financially with extra value in gate receipts, television contracts, radio contracts, merchandise sales and other revenue sources given the ability to tap into a large base of current students and alumni. The PUBLIC variable is positive but not statistically significant. Men's basketball programs at public institutions appear to be slightly more profitable than private institutions but not at a statistically significant level. Duke, Baylor, Wake Forest, Stanford, and Vanderbilt are a handful of private institutions that are national powers in men's college basketball that effectively compete against flagship state institutions. Number of female athletes (FATHLETES) at the institution has a positive but statistically insignificant impact on men's college basketball profit. The expansion of women's athletic programs and increasing the number of female athletes at an institution does not appear to have a significant impact men's basketball. Although not statistically significant, it is interesting to note the sign on the FATHLETES variable is positive and not negative. The increasing number of female athletes on many college campuses does not appear to have harmed the profitability of men's college basketball programs.

All three of the resource control variables employed in the empirical model are positive and two of the three are statistically significant. Athletic programs with a relatively large recruiting budget (RECRUIT) for male student athletes appear to earn a return on their investment by producing basketball programs with significant profit. The regression coefficient associated with the RECRUIT variable implies every dollar spent on recruiting produces approximately $2 of men's basketball profit, holding other variables constant. The positive relationship between financial resources to recruit student athletes and college basketball profit is not surprising given the ability of one star player to influence a basketball game. Average head coach pay (COACH) for male sports has a positive and statistically significant impact on men's college basketball profits. The result is not surprising given that the head coach is the implicit star for many high-profile basketball programs. Players come and go but head coach like Mike Krzyzewski (Duke University), Jim Calhoun (University of Connecticut), Tom Izzo (Michigan State), John Calipari (University of Kentucky), and Roy Williams (University of North Carolina) are the central identifiable figures for their respective programs. Top coaches that win and run a successful men's basketball program earn large salaries. It is worth noting that head coach pay as measured in this analysis is a proxy but not the actual total head coach compensation. Resources outside the normal university budget via shoe contracts, merchandise sales, television shows, radio shows, web subscription services, booster endowments, and sponsorships are additional sources of compensation for most men's basketball head coaches. The empirical results indicate assistant coach compensation (ASSISTANT) is a positive but not a statistically significant determinant of men's college basketball profitability. The result implies that assistant coaches influence the profitability of men's college basketball programs but head coaches are a much more significant determinant.

The final variable in the model is the rating percentage index variable (RPI). The RPI variable is a negative and statistically significant determinant of men's college basketball profits.

The regression coefficient associated with RPI implies winning and strength of schedule matter to men's basketball fans. Men's basketball has been growing in popularity for several decades and fans, alumni, and boosters clearly expect to see a good product on the court if they are going to offer financial support. Earning a ranking in the top twenty-five of the RPI is a status that energizes the support base, while men's teams with RPI of 100 and above risk losing their support base.

CONCLUSION

Athletic programs are an important financial and marketing instrument for many colleges. College basketball is enormously popular in the United States, and there is evidence that its appeal is growing. This study investigates the determinants of men's college basketball profit. Division I-A status in football, amount of student financial aid to athletics, size of the institution, recruiting expenses spent on male athletes, and compensation of head coach are positive and statistically significant determinants of men's college basketball profitability. Ranking measured by the rating percentage index is an inverse and statistically significant determinant of men's college basketball profits. The most interesting policy result of the study is the observation that percentage of aid allocated to women's athletics and number of female athletes on a campus do not have a negative impact on the profitability of men's college basketball. Although there is no statistical evidence that women's athletics are complements to men's college basketball, the empirical results imply that Title IX actions have not undermined the financial viability of men's college basketball. Avenues for future research include investigating the determinants of profits in other collegiate sports such as women's college basketball, evaluating the determinants of athletic programs profitability instead of focusing on specific sports, and evaluating structural changes in the profitability of men's college basketball via a time-series approach.

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Table 1: Summary Statistics of Men's College Basketball Profit

Variable	Mean	Maximum	Minimum	Standard Dev.
BPROFIT	1,097,465	17,134,624	-1,522,981	2,686,748
APROFIT	1,329,228	26,180,789	0	3,474,836
DIA	0.53	1	0	0.5000
AID	4,753,852	15,478,248	0	2,841,703
AIDWOMEN	41.6	61	6	9.7720
STUDENTS	12,937	36,612	1,678	8,223
PUBLIC	0.74	1	0	0.4381
FATHLETES	193	436	88	88.047
RECRUIT	341,360	1,653,028	18,978	270,669
COACH	192,864	903,890	16,674	170,443
ASSISTANT	67,848	182,779	10,748	16,209
RPI	152.79	336	1	98.192

n = 217

Table 2: Determinants of Men's College Basketball Profit

Variable	Full-Model Coefficient (t-stat)	Reduced Model Coefficient (t-stat)
Intercept	-1,417,284 (-1.26)	-39,659 (-0.07)
APROFIT	-0.0377 (-0.71)	
DIA	769,332 (1.42)	908,222 (1.96*)
AID	0.0823 (0.92)	0.1076 (1.99*)
AIDWOMEN	17,314 (0.89)	
STUDENTS	25.8 (0.84)	47.342 (2.00*)
PUBLIC	406,322 (0.82)	
FATHLETES	2,387 (1.01)	
RECRUIT	1.987 (1.96*)	2.006 (2.14*)
COACH	3.356 (2.04*)	3.560 (2.58*)
ASSISTANT	3.070 (0.34)	
RPI	-4,997 (-2.44*)	-5,564 (-2.82*)

Notes: R-square for full model is .4269, R-square for reduced model is .4009, F-value for full model is 10.34, F-value for reduced model is 18.75, and *p<.05.