Determinants of Women’s College Basketball Profit

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ABSTRACT

This paper presents empirical results investigating the determinants of women’s college basketball profit. The research sample is 217 college basketball programs from the 2007 season. Significant positive determinants of women’s college basketball profits are percent of student aid to women, size of the institution, and number of female athletes at an institution. The empirical results indicate profitability of the overall athletic program, student financial aid to athletics, ranking and recruiting expenses spent on female athletes are negative and statistically significant determinants of women’s college basketball profits. Model results imply an institution with division I-A classification for the football program, public institutions, and compensation of coaches are not significant determinants.

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 public relations and institutional branding produced by successful athletic programs (Smith, 2008).

Women’s college basketball is usually the highest profile female sport on campus and is one of the highest profile programs in most college athletic programs. The purpose of this research is to investigate the determinants of women’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 women’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 women’s college basketball but numerous studies have explored the impact of college football profitability and college football success. 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 and designation as public institutions are not statistically significant determinants of college football profits.

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 metropolitan civilian 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 & Gering, 2000; Turner, Meserve & Bowen, 2001; Monks, 2003; Holmes, Meditz & Sommers, 2008). Rees and Schneipel (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.

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 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) found that African-American coaches were 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.

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 women’s college basketball remained. The explicit empirical model employed to investigate women’s college basketball profit is specified as follows:

\[
WBPROFIT_i = B_0 + B_1 APROFIT_i + B_2 DIA_i + B_3 AID_i + B_4 AIDWOMEN_i + B_5 STUDENTS_i + B_6 PUBLIC_i + B_7 FATHLETES_i + B_8 RECRUIT_i + B_9 COACH_i + B_{10} ASSISTANT_i + B_{11} RPI_i + u_i.
\]

Table 1 presents summary statistics for model variables. The dependent variable WBPROFIT measures women’s college basketball program profits (reported revenue minus cost) at the institution. Twenty-three colleges report earning positive women’s college basketball profits, 42 colleges report breaking even on women’s college basketball, and 152 programs report losses for women’s college basketball. The University of Connecticut, University of Rhode Island, Princeton, Brown, Murray State, and Fordham are six of the most profitable programs, with profits ranging from $50,000 to $1,000,000.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Standard Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>WBPROFIT</td>
<td>-688,051</td>
<td>982,165</td>
<td>-3,378,575</td>
<td>815,836</td>
</tr>
<tr>
<td>APROFIT</td>
<td>1,329,228</td>
<td>26,180,789</td>
<td>0</td>
<td>3,474,836</td>
</tr>
<tr>
<td>DIA</td>
<td>0.53</td>
<td>1</td>
<td>0</td>
<td>0.5000</td>
</tr>
<tr>
<td>AID</td>
<td>4,753,852</td>
<td>15,478,248</td>
<td>0</td>
<td>2,841,703</td>
</tr>
<tr>
<td>AIDWOMEN</td>
<td>41.6</td>
<td>61</td>
<td>6</td>
<td>9.7720</td>
</tr>
<tr>
<td>STUDENTS</td>
<td>12,937</td>
<td>36,612</td>
<td>1,678</td>
<td>8,223</td>
</tr>
<tr>
<td>PUBLIC</td>
<td>0.74</td>
<td>1</td>
<td>0</td>
<td>0.4381</td>
</tr>
<tr>
<td>FATHLETES</td>
<td>193</td>
<td>436</td>
<td>88</td>
<td>88.047</td>
</tr>
<tr>
<td>RECRUIT</td>
<td>152,836</td>
<td>443,812</td>
<td>17,146</td>
<td>103,330</td>
</tr>
<tr>
<td>COACH</td>
<td>78,902</td>
<td>272,322</td>
<td>20,910</td>
<td>42,877</td>
</tr>
<tr>
<td>ASSISTANT</td>
<td>36,366</td>
<td>90,722</td>
<td>8,804</td>
<td>16,209</td>
</tr>
<tr>
<td>RPI</td>
<td>152,76</td>
<td>333</td>
<td>1</td>
<td>98,593</td>
</tr>
</tbody>
</table>

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 women’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.

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. Holding the success of the program constant (which the RPI variable does), one would expect any positive effect a large student support budget would have on profitability would be captured in the by the RPI variable. AID should have a negative impact on the profitability of women’s basketball in the model. The AIDWOMEN variable is the percentage of student aid to athletes distributed to women. The expectation is for the variable to have a positive impact on women’s college basketball profitability. Institutions with dedicated support for women’s athletic programs beyond the minimum requirements put forth by Title IX should have a greater probability of running successful and financial profitable programs.

The independent variables STUDENTS, PUBLIC, and FATHLETES are institutional control variables. The STUDENTS variable captures the size of the institution. The variable STUDENTS measures 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 should have a positive impact on women’s college basketball profitability based on the assumption that a larger number of female athletes on a campus are indicative of an institution with one or more successful women’s program, which is likely to be women’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 female student athletes. The largest recruiting budget in the sample is $443,812 at Auburn University, while the smallest reported recruitment budget is $17,146 at Alcorn State University. RECRUIT should have a negative impact on the profitability of women’s basketball. While it is true that a higher recruiting budget should create a successful program that energizes support for the program, the success of the program is captured in the RPI variable. Therefore, holding the success of the program constant, more money spent on recruiting should lower profitability. The COACH variable measures the average pay of head coaches in female sports at the institution. The COACH variable serves as a proxy for pay of head women’s college basketball coach, which should be highly correlated with average head coach pay at an institution. The highest reported average female sport head coach pay is $272,322 at the University of Texas. It is worth noting that several coaches earn additional compensation beyond institutional pay via shoe contracts, various media shows featuring the coach, and other sources of funds. The variable ASSISTANT is the final resource variable in the model and accounts for the average pay of assistant coaches in female sports. Texas A&M University women’s teams have the highest paid assistant coaches at an average of $90,722. Similar to RECRUIT, having a better, more highly paid coaching staff should translate into a more successful program that generates more profits. However, like recruiting, paying a coaching staff is an expense that should decrease profitability. So, again as with RECRUIT, holding the success of the program constant, a more expensive coaching staff should have a negative impact on profitability.

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). RPI is synonymous with the type of program success that should translate into profitability. Nothing should stimulate fan support more than winning against top competition. The top rated RPI program in the 2007 research sample is the University of Tennessee. RPI should have an inverse relationship with women’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 women’s college basketball programs. The ordinary least squares (OLS) model explains over 57 percent of the variance in women’s college basketball profitability. Several independent variables have correlations higher than 0.65, which indicates that multicollinearity could be a problem in the analysis. On the other hand, there might be enough observations to offset any problems that multicollinearity might otherwise give. 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. Seven of the eleven independent variables in the model are statistically significant in at least one of the model specifications. The highest correlation is 0.82 between the variables COACH and ASSISTANT.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Full-Model Coefficient (t-statistic)</th>
<th>Reduced Model Coefficient (t-statistic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>614,706 (2.33*)</td>
<td>478,220 (2.38*)</td>
</tr>
<tr>
<td>APROFIT</td>
<td>-0.0200 (-1.58)</td>
<td>-0.0210 (-1.70**)</td>
</tr>
<tr>
<td>DIA</td>
<td>-122,194 (-1.02)</td>
<td></td>
</tr>
<tr>
<td>AID</td>
<td>-0.0480 (-1.87**)</td>
<td>-0.0551 (-2.98*)</td>
</tr>
<tr>
<td>AidWOMEN</td>
<td>9,157 (1.98*)</td>
<td>8,167 (1.84**)</td>
</tr>
<tr>
<td>STUDENTS</td>
<td>15.5470 (2.02*)</td>
<td>17.5650 (3.09*)</td>
</tr>
<tr>
<td>PUBLIC</td>
<td>76,753 (0.63)</td>
<td></td>
</tr>
<tr>
<td>FATHLETES</td>
<td>1.681 (2.75*)</td>
<td>1.826 (3.39*)</td>
</tr>
<tr>
<td>RECRUIT</td>
<td>-3.7874 (-4.90*)</td>
<td>-4.3349 (-6.88*)</td>
</tr>
<tr>
<td>COACH</td>
<td>-1.7061 (-0.83)</td>
<td></td>
</tr>
<tr>
<td>ASSISTANT</td>
<td>-1.0990 (-0.25)</td>
<td></td>
</tr>
<tr>
<td>RPI</td>
<td>-818.12 (-2.05*)</td>
<td>-921.16 (-2.09*)</td>
</tr>
</tbody>
</table>

Notes: R-square for full model is .5800, R-square for reduced model is .5729, F-value for full model is 25.68, F-value for reduced model is 46.94, *p<.05, and **p<.10.

The first variable in the model is APROFIT, which measures the impact of the profitability of the overall athletic program on women’s college basketball profits, holding other variables constant. The APROFIT variable is negative but not statistically significant in the full model and is negative and statistically significant in the more parsimonious reduced model. The result indicates that athletic programs that are highly profitable tend to use excess funds to support women’s basketball instead of treating women’s basketball as a profit center. Although growing in popularity, women’s college basketball is still a non-revenue generating sport on most campuses and often relies on football and men’s basketball for financial support. It is a bit surprising that the coefficient is both negative and significant, as we would expect the most profitable athletic programs to have positive cash flow from most of the major sports programs, including women’s basketball. On the other hand, given 152 programs in the sample earned a negative profit, the empirical result could be viewed as confirmation that football is the key profit driver that subsidizes most athletic programs on a campus.

The DIA categorical variable is not statistically significant. It is possible that high profile Division I-A football programs could offer women’s college basketball exposure, which could increase profitability. The empirical results of this study indicate women’s college basketball profitability is not highly influenced by being at an institution with Division I-A classification for football.

Financial aid to student athletes has a significant impact on the profitability of women’s college basketball programs. The total dollar amount of student aid to athletes (AID) has a negative impact on profitability. Increasing student aid to athletes is a cost, which should decrease profitability. This study verifies that increasing student aid to athletes has a negative and statistically significant impact on women’s college basketball profitability. The percentage of the student aid allocated to female athletes (WOMENAID) has a positive and statistically significant impact on women’s college basketball. Institutions with the ability to dedicate support for women’s athletic programs beyond the minimum requirements put forth by Title IX have a greater probability of running successful and financially profitable
women’s college basketball program. It is possible that the most profitable women’s college basketball programs offer more financial aid to female athletes as a percentage because monies generated by the program is invested back into women’s athletics.

Two of the three institutional variables are statistically significant. Size of the institution measured by number of undergraduate students (STUDENTS) is a positive and statistically significant determinant of women’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. Women’s basketball programs at public institutions appear to be slightly more profitable than private institutions but not at a statistically significant level. Number of female athletes (FATHLETES) at the institution has a positive and statistically significant impact on women’s college basketball profit. The result is consistent with the assumption that a larger number of female athletes on a campus are indicative of an institution with one or more relatively successful women’s program, which is often women’s basketball. At this time, women’s basketball tends to be the highest profile female sport at most campuses. Financially viable basketball programs can serve as an impetus for expansion of other women’s athletic programs at an institution.

Only one of the resource control variables employed in the empirical model is statistically significant. Athletic programs with a relatively large recruiting budget (RECRUIT) for female athletes appear to have smaller profit women’s college basketball program. The regression coefficient associated with the RECRUIT variable implies every dollar spent on recruiting yields a negative $3.79 with respect to women’s college basketball profit, holding other variables constant. One might think this is unexpected given that a higher recruiting budget should lead to better quality student athletes and consequently a more successful, profitable program. However, the negative relationship between financial resources to recruit female student athletes and women’s college basketball profits is not surprising given that recruiting is an expense. The success of the program is held constant in the model by the RPI variable. Therefore, holding winning against quality competition constant, one would expect that RECRUIT to be negative, as it is in the model. The results that are conceivably the most surprising are the estimates on head coach pay (COACH) and assistant coach pay (ASSISTANT) are negative and not statistically significant. This is, however, the expected result given that salaries are an expense and any benefits of a high quality, highly paid coaching staff should be measured by RPI. One possible explanation for the negative and insignificant empirical result is based on the degree of multicollinearity between the two variables is too high for inclusion of both variables to be in the model, although this should have been mitigated by the stepwise elimination approach, which deleted ASSISTANT before COACH was also found to be insignificant in isolation. A second possible explanation for the statistical insignificance of head coaches pay is that many head coaches are compensated by resources outside the normal university budget via shoe contracts, merchandise sales, television shows, radio shows, web subscription services, booster endowments, and sponsorships. Hence, head coach pay as measured in this analysis is not a true reflection of total head coach compensation. If that is indeed the case, the insignificant coefficient is not surprising.

The final variable in the model is the rating percentage index variable (RPI). The RPI variable is a negative and statistically significant determinant of women’s college basketball profits. The regression coefficient associated with RPI implies winning and strength of schedule matter to women’s basketball fans. Women’s basketball has been growing in popularity for several years 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 women’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. Women’s college basketball is one of the highest profile female sports. This study investigates the determinants of women’s college basketball profit. Percent of student aid to women, size of the institution, and number of female athletes at an institution are positive and statistically significant determinants of women’s college basketball profitability. Profitability of the
overall athletic program, student financial aid to athletics, ranking measured by the rating percentage index, and recruiting expenses spent on female athletes are negative and statistically significant determinants of women’s college basketball profits. The most interesting result of the study is the observation that percentage of aid allocated to women’s athletics has a positive and significant impact on the profitability of women’s college basketball. A policy implication is that programs supporting women’s athletics beyond minimum Title IX requirements are more likely to achieve relative financial success for their women’s programs. Avenues for future research include investigating the determinants of profits in other collegiate sports such as men’s college basketball, evaluating the determinants of athletic programs profitability instead of focusing on specific sports, and evaluating structural changes in the profitability of women’s college basketball via a time-series approach.

REFERENCES


