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Competitive Balance in NCAA "Power Conferences:" The Case of Men's and Women's Basketball

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ABSTRACT

The uncertainty of outcome hypothesis as well as past research has suggested that unless there is competitive balance among teams fans lose interest and revenue declines. It follows that the greater the sources of revenue the more likely one would find competitive balance. Using the standard deviation, as well as the range of winning percentages, the authors of this study compared over a seven year period the competitive balance of the NCAA "Power 5" conferences' men's basketball teams, a high revenue sport, to the competitive balance of the NCAA "Power 5" conferences' women's basketball teams, a lower revenue sport. The results of this study indicated considerably more competitive balance among the men's teams than among the women's teams, thus supporting the uncertainty of outcome hypothesis, as well as past research on the topic. The fact that women's basketball is a lower source of athletic revenue when compared to men's basketball suggests competitive balance in that sport has historically been a lower priority than in the highest level sports. This becomes an important issue as efforts are continually being made to enhance intercollegiate women's sports.

Key words: competitive balance, college basketball

INTRODUCTION

Competitive balance is often valued in sport settings. Whereas industrial organizations would desire the least amount of competition possible, sports organizations need a certain amount of competitive balance in order to be viable. While fans always want their team to win, they do not want this win to be a foregone conclusion. The related economic principle is commonly referenced as the uncertainty of outcome hypothesis (15). Indeed, without this balance fans would lose interest and revenues would decline (1-2, 5-8, 14, 16).

In professional sports the various sports leagues, i.e., National Football League (NFL), National Hockey League (NHL), National Basketball Association (NBA), Major League Baseball (MLB), Women's National Basketball Association (WNBA) use methods such as salary caps, luxury taxes, revenue sharing, and reverse of finish drafts as tactics designed to improve competitive balance. Similarly, in intercollegiate sports the National Collegiate Athletic Association (NCAA), through its various rules and regulations, and the many conferences through their scheduling, budgeting, and membership selection, attempt to achieve an appropriate amount of competitive balance.

Whereas such a desirable balance would be appropriate for all sports, a certain degree of competitive balance is particularly important in sports that are major sources of revenue for athletics departments and their conferences. Football and men's basketball are most commonly the sports that generate large amounts of revenue. A Business Insider analysis of U.S. Department of Education data found that the average NCAA Division I-A football program generated $29.6 million in annual revenue (3). Men's basketball was a distant second at $7.9 million per year but still significantly ahead of women's basketball at $1.6 million. Given linkages among competitive balance, uncertainty of outcome, and revenue potential, one may hypothesize that efforts to maximize fan appeal in college athletics have resulted in greater competitive balance in men's sports than women's sports.

LITERATURE REVIEW

The majority of research on competitive balance in college athletics has focused on football (17), and to a lesser extent, men's college basketball. However, scholars have devoted some attention to women's basketball as well.

Noting that one of the NCAA's priorities is promoting competitive balance, Peach (12) compiled data pertaining to the number of Final Four appearances by team for men's and women's basketball. Peach reported that just six teams accounted for 51.0% of women's Final Four games between 1982 and 2005. Peach's analysis of the men's tournament indicated that the top six teams in terms of number of games between 1950 and 2006 accounted for 32.6% of the games. This indicated less competitive balance in the women's game than the men's.

Competitive balance in men's and women's basketball was the focus of a comparison conducted by Perline and Stoldt (13). Using three measures to assess such balance, the authors analyzed data from a 10-year period (1996-97 through 2005-06) in the Missouri Valley Conference. Results associated with all three measures indicated greater levels of competitive balance in men's basketball than women's. The authors concluded that the results supported their hypothesis that more competitive balance would be found in the sport with the higher revenue.

In their examination of competitive balance across multiple college sports, Treber et al (17) included analysis in the NCAA's basketball championship tournaments (men's 1985-2011, women's 1994-2011). They found that first-round upsets occurred less often in the women's tournament than the men's. Analysis of the average of the seed numbers advancing to subsequent rounds also indicated that fewer upsets occurred in the women's tournament than the men's. Finally, the authors studied the degree to which championships were distributed among different teams. Results indicated that NCAA titles were concentrated among fewer teams in the women's tournament than the men's. These results also indicate more competitive balance in the men's sport.

METHOD

To test the hypothesis that collegiate men's basketball is more competitively balanced than women's basketball, we compared the degree of competitive balance in both men's and women's basketball in what is commonly referred to as the NCAA Division I "power conferences." While there is no official entity that classifies conferences into "power" and "non-power" conferences, the fans and media routinely use these designations. These are the conferences whose athletic programs are generally considered the most successful in the country, and those with the largest athletic budgets. They consist of the Atlantic Coast Conference (ACC); Big 10 Conference (BIG 10); Big 12 Conference (BIG 12); Pacific-12 Conference (PAC 12); and Southeastern Conference (SEC), sometimes referred to as the "Power 5." The selection of these conferences appeared most appropriate as they are the conferences with the largest sources of revenue, most of which come from men's sports, and thus the conferences most likely to attempt to achieve greater amounts of competitive balance to maintain fan interest and thus higher revenues from attendance, media, and other sources of revenue. More specifically, we measured competitive balance over the seven-year period, 2011-12 through 2017-18. This time frame appeared to be particularly relevant since a considerable amount of movement among these conferences took place during these years. For instance, between the above years a number of programs left a conference – sometimes another "power conference" school, sometimes a "non-power conference" school – to join one of the power conferences. Schools which belonged to a given "power conference" in 2017-18 which were not there in 2011-12 included Louisville, Syracuse, Pittsburgh, and Notre Dame in the ACC; West Virginia, and Texas Christian in the Big 12; Maryland, and Rutgers in the Big 10; and Missouri, and Texas A&M in the SEC. The

only conference with a stability of membership in both periods was the PAC 12. While there may have been many reasons for these conference changes, the desire to improve competitive balance may have been one.

Measuring Competitive Balance

While there are several ways of measuring competitive balance, one of the most popular is the standard deviation of winning percentages of the various teams in a conference within a particular season. This method simply recognizes that .500 is the average winning percentage within conference competition because, discounting ties, each game results in one winner and one loser. The standard deviation, which measures the dispersion of winning percentages around the .500 average, enables us to ascertain the degree of competitive balance in a conference.

Standard Deviation Formula

$$\sigma = \sqrt{\frac{\sum(WPCT - .500)^2}{N}}$$

Where WPCT is the winning percentage of each team in the league in the year, .500 is the average winning percentage of all teams in the year, and N is the number of teams in the league.

The larger the standard deviation, the greater the dispersion of winning percentages around the overall conference average. The smaller the standard deviation, the less the dispersion of the conference winning percentages. Higher standard deviations indicate less competitive balance; lower standard deviations indicate more. If a conference were to attain perfect competitive balance, every team would have a conference winning percentage of .500. In such a case, the standard deviation would be 0.

Range of Winning Percentages

The range of winning percentages approach we used entailed measuring the number of teams in the conference which were within .100 deviation from the perfect competitive balance, which would be .500. More specifically, this approach involved measuring the number of teams within the range of .400 to .600 over the seven year period 2011-12 to 2017-18, divided by the total number of teams won-loss records over this time frame. The higher the percentage of teams within this range, the more competitive balance in the conference. For instance, ACC women's basketball had 15 teams within this range over the period measured, and there were 99 with won-loss records. This yielded a score of 15.2% (15/99). If every team had a record between .400-.600, there would be enhanced competitive balance (99/99) or 100%.

It is certainly possible that this approach and the approach using the standard deviation could produce different results. For instance, with this approach there could be many institutions within the .400-.600 range which would suggest a high degree of competitive

balance, but if there were outliers at the top and/or bottom of the standings, the standard deviation would be increased which would suggest a lesser amount of competitive balance.

RESULTS
Tables 1 and 2 display the standard deviations for men's and women's basketball teams for all seven years for all five power conferences, and Tables 3 and 4 display the results using the percentages based on the range of winning percentages. The mean results using the aforementioned methods are contained in Tables 5 and 6.

Table 1: Men's Basketball - Standard Deviations by Year

Conference	2017-18	2016-17	2015-16	2014-15	2013-14	2012-13	2011-12	Mean
ACC	.212	.188	.215	.229	.211	.191	.220	.209
BIG 10	.248	.159	.228	.217	.162	.208	.184	.201
BIG 12	.129	.205	.228	.181	.203	.230	.250	.204
PAC 12	.182	.266	.196	.196	.187	.168	.222	.202
SEC	.128	.214	.157	.209	.196	.183	.210	.185
Mean	.180	.206	.205	.208	.192	.196	.217	.200

Original data on which Table is based www.espn.com/mens-college-basketball/standings

Table 2: Women's Basketball - Standard Deviations by Year

Conference	2017-18	2016-17	2015-16	2014-15	2013-14	2012-13	2011-12	Mean
ACC	.279	.268	.289	.265	.234	.229	.274	.263
BIG 10	.234	.251	.228	.245	.237	.209	.222	.232
BIG 12	.269	.260	.286	.174	.261	.236	.215	.243
PAC 12	.278	.238	.272	.238	.236	.279	.212	.250
SEC	.274	.211	.223	.241	.203	.237	.228	.232
Mean	.267	.246	.260	.233	.234	.238	.231	.244

Original data on which Table is based www.espn.com/mens-college-basketball/standings

Table 3: Men's Basketball - Range of Winning Percentages by Year

Conference	2017-18	2016-17	2015-16	2014-15	2013-14	2012-13	2011-12	Mean
ACC	33.3	33.3	40.0	40.0	26.7	16.7	33.3	31.9
BIG 10	21.4	35.7	14.3	21.4	25.0	33.3	25.0	25.1
BIG 12	60.0	20.0	30.0	30.0	40.0	20.0	10.0	30.0
PAC 12	33.3	25.5	41.7	25.0	66.7	41.7	8.3	34.5
SEC	50.0	42.9	35.7	21.4	35.7	28.6	33.3	35.4
Mean	39.6	31.5	32.3	27.6	38.8	28.1	22.0	31.4

Original data on which Table is based www.espn.com/mens-college-basketball/standings

Table 4: Women's Basketball - Range of Winning Percentages by Year

Conference	2017-18	2016-17	2015-16	2014-15	2013-14	2012-13	2011-12	Mean
ACC	0.00	6.7	13.3	33.3	20.0	8.3	25.0	15.2
BIG 10	28.6	28.6	35.7	14.3	16.7	41.7	8.3	24.8
BIG 12	20.0	20.0	20.0	40.0	30.0	30.0	50.0	30.0
PAC 12	25.0	16.7	16.7	8.3	16.7	8.3	41.7	19.1
SEC	7.1	28.6	35.7	14.3	42.9	7.1	16.7	21.7
Mean	16.4	20.1	20.0	23.4	34.0	18.3	23.3	22.2

Original data on which Table is based www.espn.com/mens-college-basketball/standings

Table 5: Men's Basketball - Mean Standard Deviations and Range of Winning Percentages by Conference

Conference	Standard Deviation	Range of Winning Percentage
ACC	.209*	31.9*
BIG 10	.201*	25.1*
BIG 12	.204*	30.0..
PAC 12	.202*	34.5*
SEC	.185*	35.4*
Mean	.201*	31.4*

*indicates greater competitive balance in men's conference

original data on which Table is based www.espn.com/mens-college-basketball/standings

Table 6: Women's Basketball - Mean Standard Deviations and Range of Winning Percentages by Conference

Conference	Standard Deviation	Range of Winning Percentage
ACC	.263	15.2
BIG 10	.232	24.8
BIG 12	.243	30.0
PAC 12	.250	19.1
SEC	.232	21.7
Mean	.244	22.2

original data on which Table is based www.espn.com/mens-college-basketball/standings

As indicated in Tables 1 and 2 there was greater competitive balance among the men's basketball conferences than among the women's. The overall mean standard deviation for the seven-year period was .201 for the men's conferences and .244 for the women's. This was over a 17% differential. Indeed, in every year tested, the men's conferences overall had a lower mean standard deviation than that of their female counterpart, indicating more overall competitive balance among the men's conferences than among the women's. On an individual conference basis these varied from an advantage for the men of seven out of seven years for the ACC, to five out of seven years for the Big 12 and Pac 12, The other two conferences (Big 10, and SEC) showed a greater degree of competitive balance for the men in 6 of the 7 years under consideration.

Interestingly enough, when using the range of winning percentages (.400-.600), the results were quite similar to those achieved using the standard deviations. As indicated in Tables 3 and 4, the women had a mean percentage of 22.2 over the seven year period, whereas the men had a mean percentage of 31.4. More specifically, in four of the five conferences studied, the competitive balance was greater for the men than for the women. In one conference, the Big 12, the percentages were tied at 30%. Given the relationship between competitive balance and revenue received, the results using this approach reinforced the results obtained using the standard deviation. Lastly, Tables 5 and 6 summarize the results of the previous tables.

The bottom line suggests that whether one compares the standard deviation, or the range of winning percentages over the years studied, the men's basketball conferences were considerably more competitively balanced than the women's. This result is consistent with the hypothesis that a certain degree of competitive balance is necessary to keep fans interested when larger sources of revenue are involved. Since the potential revenues

received by men's basketball teams are considerably greater than for women's basketball teams, one would expect a greater degree of competitive balance for the men's conferences than for the women's.

CONCLUSIONS

The uncertainty of outcome hypothesis suggests that lack of competitive balance within a league or conference can negatively impact fan interest. When fan appeal wanes, revenue from attendance and media rights fees may also decline.

Given this fact, we hypothesized that since revenues were considerably higher in men's basketball than in women's basketball for the Power 5 conferences, it was expected that there would be more competitive balance in men's basketball than in women's. Using the standard deviation and the range of winning percentages as measures of competitive balance, we found from various data comparisons that there was indeed greater competitive balance among the men's basketball conferences than among the women's, thus supporting the hypothesis that where there is greater potential revenue there should be greater competitive balance.

LIMITATIONS

Although our results were consistent with the hypothesis advanced, these results can only be based on the five power conferences studied, and the seven year period over which the data was collected and analyzed. To be sure, a study of other conferences and other time frames could yield different results. Hopefully, such research will be forthcoming.

APPLICATIONS IN SPORT

The Rottenberg Uncertainty of Outcome Principle, as well as our research, suggests that without competitive balance revenue declines, and so it follows that in order to maintain high revenue, competitive balance is necessary (1-2, 5-8, 14, 16). This would be particularly true in high revenue sports such as football and men's basketball.

The fact that women's basketball is a lower source of athletic revenue suggests competitive balance in that sport has historically been a lower priority than in the highest level sports. This becomes an important issue as efforts are continually being made to enhance intercollegiate women's sports. However, two factors impacting competitive balance across college athletics make the task specific to women's college basketball particularly challenging. First, the NCAA has, by its own admission, decreased its emphasis on competitive equity in favor of some level of deregulation. A 2013 reduction in NCAA Division I rules was part of the organization's philosophical shift away from "competitive equity" in favor of "fairness of competition." (4).

A second reason why improving competitive balance in Division I women's basketball may be challenging is that governance tactics traditionally tied to supporting competitive balance in college athletics may have such negative consequences in light of other values that they are in essence off the table. Scholarship limits are one such tactic. Currently at the NCAA

Division I level, women's basketball programs are allowed to offer 15 scholarships while men's programs may offer 13. Hypothetically, a reduction from 15 to 13 scholarships per women's program would result in broader dispersion of the most talented players and possibly more competitive balance. However, the associated reduction in participation opportunities for female athletes likely (and understandably) precludes the prospective tactic from receiving serious consideration. Compliance with federal legislation (i.e., Title IX) also weighs into such decisions.

Attendance figures and television viewership for women's college basketball are flat. NCAA attendance data (9) for women's college basketball indicate that in 2012 total attendance was 8.2 million and average attendance 1,634. In 2017, total attendance was 8.3 million and average attendance was 1,586. Nielsen Scarborough data (10) for television viewership reflected a similar plateau with 6.41 million people viewing a women's college basketball in Spring 2012 and 6.5 million in Spring 2017. However, revenue for NCAA I women's basketball is trending in a positive direction. Data from the U.S. Department of Education (18) indicate women's college basketball generated more than $749 million in 2012; that number increased to more than $902 million in 2016 (most recent available). This growth is occurring in spite of what our data would indicate is a decrease in competitive balance in the most recent three years (i.e., Table 2 indicates the highest standard deviations by year occurred 2015-16 through 2017-18). Given stagnant fan interest, the rise in revenue could be due to higher ticket prices, increased sponsorships and/or enhanced media deals with the conferences or NCAA. Without fan interest increasing, often a function of better competitive balance, the increase in revenue is likely to be constrained.

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