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What Style of Ball Should a College Basketball Team Play?

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Abstract

The question I am trying to answer in this paper is "what style of ball should a college basketball team play?" To answer this question, I analyzed the data of points per game, opponent points per game, and winning percentage of every Division I and Division II and almost every Division III basketball team for the 2016-17 season. I concluded that offense is slightly more important than defense for Division II and Division III college basketball teams. Division II and Division III coaches can apply this finding by emphasizing their recruiting on better scorers.

Keywords: player selection, playing style, recruiting

What Style of Ball Should a College Basketball Team Play?

The question I am trying to answer in this paper is "what style of ball should a college basketball team play?" I got the idea for this question from the chapter in Tobias J. Moskowitz and L. Jon Wertheim's *Scorecasting: The Hidden Influences Behind How Sports Are Played and Games Are Won "*Offense Wins Championships, Too" (2011). To answer this question, I gathered the data of points per game, opponent points per game, and winning percentage of every Division I and Division II and almost every Division III basketball team for the 2016-17 season. This totaled to a sample size of 1062 teams. I analyzed this data in a few ways. First, I found the mean and median of points per game and opponent points per game. The mean for points per game is 74.984, while the median for points per game is 74.800. The mean for opponent points per game is 74.552, while the median for opponent points per game is 74.300 (See Table 1). Next, I ran a Pearson Correlation with all of the data. The Pearson Correlation told me that with a p-value of .000 there is a .603 correlation between points per game and winning percentage. It also told me that with a p-value of .000 there is a -.465 correlation between opponent points per game and winning percentage (See Table 2). I also ran linear regression tests for points per game and opponent points per game separately. The adjusted r-square for points per game is .363 (See Table 3). The adjusted r-square for opponent points per game is .215 (See Table 4). This means that 36.3 percent of winning college basketball games can be attributed to scoring more, while 21.5 percent of winning college basketball games can be attributed to allowing fewer points. Then, I ran a k-means cluster analysis of the data. I had five clusters of types of basketball teams in college basketball. All of these clusters were about Division II teams. The first cluster averages 80.2 points per game and allows 70.1 points per

game with a winning percentage of 78.1 percent. There are 171 teams in this cluster. I will classify this cluster as basketball teams that are really good at offense and defense. The second cluster averages 72.0 points per game and allows 70.2 points per game with a winning percentage of 54.3 percent. There are 247 teams in this cluster. I will classify this cluster as average defensive-oriented basketball teams. The third cluster averages 68.4 points per game and allows 78.6 points per game with a winning percentage of 20.4 percent. There are 173 teams in this cluster. I will classify this cluster as bad basketball teams. The fourth cluster averages 81.0 points per game and allows 76.8 points per game with a winning percentage of 61.8 percent. There are 208 teams in this cluster. I will classify this cluster as above-average offensive-oriented basketball teams. The fifth cluster averages 73.9 points per game and allows 77.2 points per game with a winning percentage of 39.2 percent. I will classify this cluster as below-average balanced basketball teams (See Tables 5 and 6). Using this data, one can see that having a good combination of both offense and defense is obviously the best way to win basketball games. While not obvious, one could infer that scoring more is more important than playing good defense in college basketball based off of the r square values and the success of cluster number four over cluster number two.

Does this conclusion hold true when I split the sample? Surprisingly, it does not. I split the sample of 1062 college basketball teams into their three divisions respectively: 347 Division I teams, 302 Division II teams, and 413 Division III teams. I analyzed these three split samples separately starting with Division I teams. First, I found the mean and median of points per game and opponent points per game for Division I teams. The mean for points per game is 73.2542, while the median for points per game is 73.2000. The mean for opponent points per game is 72.3144, while the median for opponent points per game is 72.1000 (See Table 7). Next, I ran a

Pearson Correlation. The Pearson Correlation told me that with a p-value of .000 there is a .531 correlation between points per game and winning percentage. It also told me that with a p-value .000 there is a -.539 correlation between opponent points per game and winning percentage (See Table 8). I also ran linear regression tests for points per game and opponent points per game separately. The adjusted r-square for points per game is .280 (See Table 9). The adjusted r-square for opponent points per game is .289 (See Table 10). This means that 28 percent of winning Division I college basketball games can be attributed to scoring more, while 28.9 percent of winning Division I college basketball games can be attributed to allowing fewer points. Then, I ran a k-means cluster analysis of the Division I data. I had five clusters of types of Division I basketball teams. The first cluster averages 69.61 points per game and allows 71.13 points per game with a winning percentage of 44.16 percent. There are 75 teams in this cluster. I will classify this cluster as below-average defensive-oriented teams. The second cluster averages 78.69 points per game and allows 78.10 points per game with a winning percentage of 49.62 percent. There are 57 teams in this cluster. I will classify this cluster as average offensive-oriented teams. The third cluster averages 77.56 points per game and allows 67.65 points per game with a winning percentage of 77.25 percent. There are 56 teams in this cluster. I will classify this cluster as basketball teams that are really good at offense and defense. The fourth cluster averages 73.57 points per game and allows 69.57 points per game with a winning percentage of 60.58 percent. There are 91 teams in this cluster. I will classify this cluster as above-average balanced teams. The fifth cluster averages 68.74 points per game and allows 76.28 points per game with a winning percentage of 26.09 percent. There are 68 teams in this cluster. I will classify this cluster as bad basketball teams (See Tables 11 and 12). As with all of college basketball, having a good combination of both offense and defense is obviously the

best way to win a Division I college basketball game. It is much harder to infer whether scoring more or playing good defense is more important in Division I college basketball. The r square values tell you that playing good defense is slightly more important, but the cluster analysis shows the success of cluster two over cluster one.

What about the analysis of Division II teams? First, I found the mean and median of points per game and opponent points per game for Division II teams. The mean points per game is 76.9603, while the median points per game is 76.7500. The mean for opponent points per game is 76.2589, while the median for opponent points per game is 76.4500 (See Table 13). Next, I ran a Pearson Correlation. The Pearson Correlation told me that with a p-value of .000 there is a .650 correlation between points per game and winning percentage. It also told me that with a p-value of .000 there is a -.451 correlation between opponent points per game and winning percentage (See Table 14). I also ran linear regression tests for points per game and opponent points per game separately. The adjusted r-square for points per game is .420 (See Table 15). The adjusted r-square for opponent points per game is .201 (See Table 16). This means that 42 percent of winning Division II college basketball games can be attributed to scoring more, while 20.1 percent of winning Division II college basketball games can be attributed to allowing fewer points. Then, I ran a k-means cluster analysis of the Division II data. I had five clusters of types of Division II basketball teams. The first cluster averages 74.60 points per game and allows 77.39 points per game with a winning percentage of 38.83 percent. There are 84 teams in this cluster. I will classify this cluster as below-average balanced basketball teams. The second cluster averages 78.86 points per game and allows 76.81 points per game with a winning percentage of 54.88 percent. There are 78 teams in this cluster. I will classify this cluster as average balanced basketball teams. The third cluster averages 69.57 points per game and allows

80.51 points per game with a winning percentage of 18.32 percent. There are 45 teams in this cluster. I will classify this cluster as bad basketball teams. The fourth cluster averages 86.51 points per game and allows 74.53 points per game with a winning percentage of 82.55 percent. There are 35 teams in this cluster. I will classify this cluster as basketball teams that are really good at offense and pretty good at defense. The fifth cluster averages 77.76 points per game and allows 71.78 points per game with a winning percentage of 67.92 percent. There are 60 teams in this cluster. I will classify this cluster as above-average balanced basketball teams (See Tables 17 and 18). As with all of college basketball, having a good combination of both offense and defense is obviously the best way to win a Division II college basketball game. It is interesting to me how much more important offense is in Division II than Division I basketball. You can see this through the r-square values and cluster four's success.

What about the analysis of Division III teams? First, I found the mean and median of points per game and opponent points per game for Division III teams. The mean points per game is 74.9920, while the median points per game is 74.5000. The mean for opponent points per game is 75.1840, while the median for opponent points per game is 74.6000 (See Table 19). Next, I ran a Pearson Correlation. The Pearson Correlation told me that with a p-value of .000 there is a .653 correlation between points per game and winning percentage. It also told me that with a p-value of .000 there is a -.457 correlation between opponent points per game and winning percentage (See Table 20). I also ran linear regression tests for points per game and opponent points per game separately. The adjusted r-square for points per game is .425 (See Table 21). The adjusted r-square for opponent points per game is .207 (See Table 22). This means that 42.5 percent of winning Division III college basketball games can be attributed to scoring more, while 20.7 percent of winning Division III college basketball games can be attributed to allowing fewer

points. Then, I ran a k-means cluster analysis of the Division III data. I had five clusters of types of Division III basketball teams. The first cluster averages 68.17 points per game and allows 79.23 points per game with a winning percentage of 18.97 percent. There are 75 teams in this cluster. I will classify this cluster as bad basketball teams. The second cluster averages 79.89 points per game and allows 71.03 points per game with a winning percentage of 75.75 percent. There are 82 teams in this cluster. I will classify this cluster as basketball teams that are really good at offense and defense. The third cluster averages 83.29 points per game and allows 79.36 points per game with a winning percentage of 60.73 percent. There are 63 teams in this cluster. I will classify this cluster as above-average offensive-oriented basketball teams. The fourth cluster averages 72.97 points per game and allows 71.28 points per game with a winning percentage of 54.55 percent. There are 98 teams in this cluster. I will classify this cluster as average defensive-oriented teams. The fifth cluster averages 72.73 points per game and allows 76.83 points per game with a winning percentage of 38.12. There are 95 teams in this cluster. I will classify this cluster as below-average balanced basketball teams (See Tables 23 and 24). As with all of college basketball, having a good combination of both offense and defense is obviously the best way to win a Division III college basketball game. Just like Division II basketball, offense is much more important in Division III basketball than it is in Division I basketball. You can see this through the r-square values and the success of cluster three over cluster four.

In conclusion, offense is slightly more important than defense for Division II and Division III college basketball teams. If demonstrated upon further research to be a consistent pattern, Division II and Division III coaches can apply this finding by emphasizing their recruiting on better scorers. This difference is not so significant that defense should be

neglected, though. In 1995, Patrick M. Wright, Dennis L. Smart, and Gary C. McMahan wrote an article titled "Matches Between Human Resources and Strategy Among NCAA Basketball Teams" in the *Academy of Management Journal*. One of their conclusions in this article was that "teams implementing a strategy different from a coach's preferred strategy performed less well than those implementing the preferred strategy" (Wright, Smart, and McMahan, 1995). Coaches like Tony Bennett at the University of Virginia can keep doing their thing if it is working for them, but if a Division II or Division III coach is struggling to win, a shift towards an offensive-oriented /speed strategy (e.g. Bob Huggins, West Virginia University) could prove to be helpful. I believe further research on this topic could revolutionize the way small college basketball is played, and that this trend found in the 2016-17 basketball season should be analyzed throughout these next few seasons.

References

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