Joe Summers & Jesse Strober
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Trying Too Hard For Rebounds: A Numerical Strategy

In the NBA, offensive rebounds give a team a great advantage. Not only does an offensive rebound reset the shot-clock and allow them another chance to score, but it also takes away the opposing team's opportunity to score in transition. Although an team on offense can slowly walk up the court in transition, a fast break gives a team a high percentage opportunity to score. This is when the offensive players outnumber the defensive players in transition, usually following a turnover. Due to this advantage, it is important for each player to pick a strategy determining whether to go for an offensive rebound or to get back in transition defense. Thus, this creates a conflict of interest for the player where both choices can This situation is constantly occurring in NBA games and each coach is responsible for deciding when, if ever, players should attempt an offensive rebound. Over the years, various coaches and teams have been noted for their choice in strategy and the value that seems to come as a result. In the light of this controversy and the increase of basketball analytics in recent years, this study examines whether a numerical analysis can provide an efficient solution to this problem. The primary goal of this paper is to estimate both the positive value of offensive rebounds and the negative value of allowing fast-break points, in order to determine which strategy is more effective. In addition, this study aims to fit a nonlinear model to the data to provide a more accurate estimation of the correlation between the two variables.

In order to provide a more accurate analysis, we had to manipulate several data sets from the same source, NBAminer.com, to extract the correct variables. To start, fast-break points are used rather than points in transition because of the loose definition of ‘transition offense,’ and a lack of available data. However, it was essential to change the units of our key variables to account for important lurking variables. Because of the reality that teams which miss more shots have more chances for offensive rebounds, these teams are more likely to have more offensive rebounds per game and more fast-break points allowed. Thus, calculating the number of offensive rebounds per missed shot would be most ideal for our analysis. Unfortunately, there was not a clear way to calculate missed shots per game from our data set, so we modified the units of our variables to be “per possession.” This added an additional source of potential error, but is a much closer fit than using the statistics per game.

The main goal of this study is to evaluate the positive impact of attempting offensive rebounds and the negative impact of allowing fast-break points from the opponent. In order to calculate this, our research group proposes two formulas which incorporate offensive rebounds, attempted offensive rebounds, and different forms of reward. Calculating the positive value of offensive rebounds, we multiplied the average number of offensive rebounds with the offensive rebounding success rate (Offensive rebounding success rate measures the number of attempted offensive rebounds out of the number of possible offensive rebounds). To add a form of reward resulting from an offensive rebound, we multiplied this product by the average number of second chance

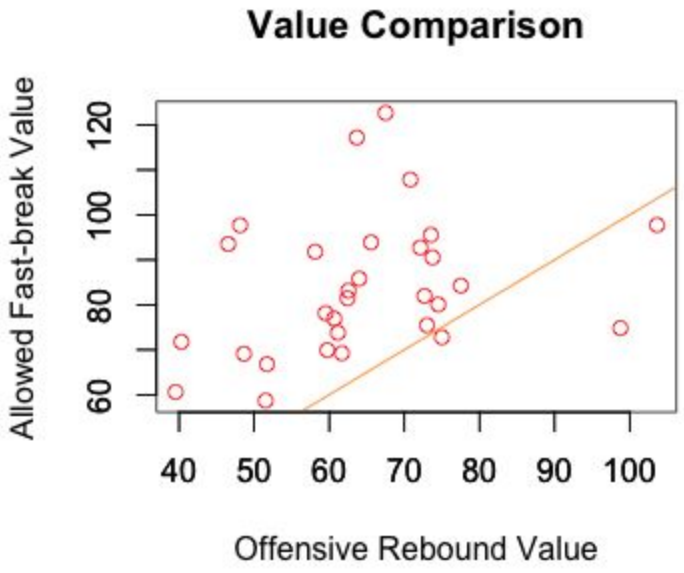
points per game. The formula for the positive value of offensive rebounds is shown below:

(Offensive Rebound Success Rate)*(Avg. # of offensive rebounds)*(Avg. # of 2nd chance points)

In order to create a comparable statistic measuring the negative value of allowing fast-break points, offensive rebounds were still included to maintain focus on the original offensive team. To represent the chance of missing an attempted offensive rebound, we subtracted our original offensive rebound success rate from one. Finally, the negative result in this situation is allowing the team two or three high percentage points. The formula used to evaluate the negative impact of allowing fast-break points is below:

(Avg. fast-break points allowed per game)*(1-rebound success rate)*(Avg. # of offensive rebounds)

After organizing the data and preparing our evaluations, we plotted the data in R to see the resulting effect. Theoretically, a team with equal value gained by offensive rebounding and lost by allowing fast-break points would have a data point lying on the line going through the plot. However, a clear majority of the teams showed a more significant negative impact by allowing fast-break points than the positive impact of their offensive rebounding. The plot is shown below:



This plot does not display team names, so the top teams in each category were noted. The top 3 teams benefiting from their offensive rebounding efforts were the Oklahoma City Thunder, the Detroit Pistons, and the Utah Jazz. On the flip side the top three teams suffering from allowed fast-break points were the Phoenix Suns, the Los Angeles Lakers, and the Memphis Grizzlies. Finally, the top three teams in reducing fast-break points by the opponent were the Los Angeles Clippers, the Atlanta Hawks, and the New Orleans Pelicans. Overall, this shows us that while teams like the Oklahoma City Thunder are able to see rewards from their rebounding strategy, teams who suffered the most need to improve their transition defense.

Our numerical analysis could be improved by using a much larger data set, optimally play by play data from an entire season. Not only would this add an extra level of granularity, but it would allow us to monitor more lurking variables such as player

height and the distance of the shot before the rebound. Another potential flaw in our analysis is the subjective nature of the offensive rebound success rate, where someone must decide when a rebound is possible and when a player makes a true effort to get it. Through our analysis, several similarities with current NBA trends appeared. To start, Oklahoma City is commonly seen as the current leader in effectively using an aggressive rebounding strategy. However, the San Antonio Spurs, known as a great transition defense team, was only ranked 6th in this regard. Overall, our results aligned with the current trend in strategy shown by coaches in the NBA.

Current Trends

We drew inspiration for our research from observing recent trends regarding rebounding rate in the NBA. Coaches like Gregg Popovich, Doc Rivers, Erik Spoelstra and Rick Carlisle have publicly eschewed going for offensive rebounds in favor of setting up on transition defense. As former San Antonio Spurs assistant and current Philadelphia 76ers Head Coach Brett Brown told ESPN, “We don’t care if you get an offensive rebound in your entire life.” The thinking is that preventing transition offense is more valuable than taking the chance at creating a second possession for your offense, because crashing the offensive glass often leaves your team vulnerable to being attacked in transition. Recent trends suggest the league as a whole is placing less emphasis on offensive rebounding. In 2001, the league average Offensive Rebounding Rate (an estimate of the percentage of available offensive rebounds a team got) was 28.2%, according to Basketball-Reference.com. During this most recent regular season, the league average was 23.8% and even this number is skewed to the top. In fact, only

the Oklahoma City Thunder (31.1%) ranked higher than the 2001 league average, with the second place Detroit Pistons pulling down only 27% of available offensive rebounds. The overall decline in offensive rebounding reflects a change in style that has left teams spreading the offense out more with shooters and playing faster. Evidence of this is reflected in 3-point attempt rate (the percentage of field goals attempted that are 3-point shots). In 2001, the league average was 17%, with the team shooting the most 3-pointers being the Boston Celtics at 25%. This past season, the 23rd-ranked Orlando Magic would have rated higher than the Celtics, shooting 3-pointers 25.5% of the time. The league average was 28.5%, while the Rockets led the league at 37%. As teams become more perimeter-oriented and shoot more 3-pointers, they are in worse position to pursue an offensive rebound. With teams clearing out the paint and having fewer traditional big men, there are fewer opportunities to grab that extra possession.

Despite the league-wide trend, there are teams like the Thunder who find success chasing offensive rebounds. It could emerge as a market inefficiency from which teams can take advantage of matchups. There is value in creating an additional offensive possession. Teams have shot 39% - well above the league average – over the last two seasons on three-point shots attempted one pass after an offensive rebounding. Coaches like Brad Stevens of the Boston Celtics argue that it can be especially deflating to defend well, give up an offensive rebound and then have it turn into a basket for the other team. There is a mental component as well that is difficult to quantify, though here we will focus on what we can quantify.

Future Implications

Moving forward, the results of this research and future research on the topic can influence coaching decisions and strategy. Given the number of coaches that are moving towards a pace-and-space era, where teams play faster and shoot from greater distances, this research hopes to give insight as to how these coaches should approach offensive rebounding in general. Should coaches forget about offensive rebounds altogether and solely focus on transition defense? Or should coaches have all five players put all of their energy towards getting an offensive rebound? The answer likely lies somewhere in between the two extremes. The Oklahoma City Thunder have shown teams can attain success by using rebounds to gain an edge. But at what cost? Regarding personnel, if teams decide to focus on transition defense and less on offensive rebounding, it is another step in the elimination of the traditional big man. If offensive rebounding, typically a skill bigger players exhibit, is valued less than it used to be, then the skills big men possess would also be valued less than they used to be. Meaning, big men as a whole could be valued less than they used to be, a consequence power forward Luis Scola feared when discussing the trend with ESPN. A larger question moving forward could ask if we properly value the power forward position and the skills associated with it. Similar questions can be asked about setting lineups. If you have a player who is elite at transition defense but poor at offensive rebounding, how do you know if you should play that player over one who has a flipped skill set? As a result, the research on offensive rebounding vs. transition defense can be used in setting coaching strategy and in making personnel moves.

Works Cited

http://www.basketball-reference.com/leagues/NBA_2001.html

http://www.basketball-reference.com/leagues/NBA_2016.html