# Data Sciencers NBA Franchise

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# Analyzing Offensive Rebound Percentage

## Introduction

Our team investigated the efficacy of using offensive rebound percentage (ORP) as the primary metric for assessing potential players. We took data from the 2019 regular NBA seasons for our analysis. Our primary objective was to scrutinize the difference between the ORP of the victorious team and the ORP of the losing team for a given game to see if the ORP plays a significant role.

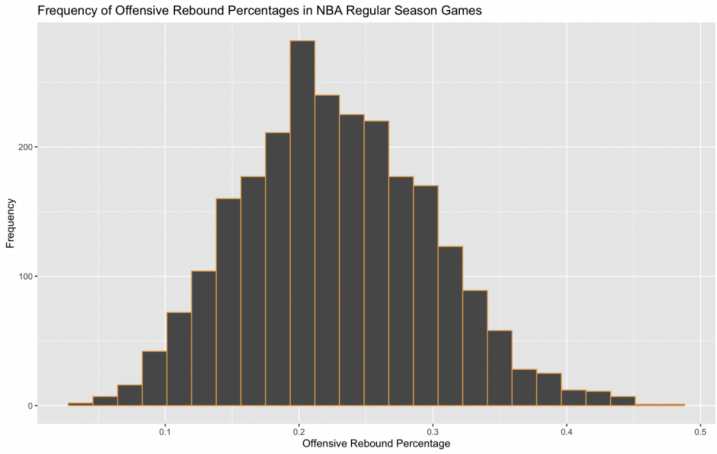


Figure 1: This graph shows the distribution of the ORP for teams that played in the 2019 regular season. Note the symmetrical distribution and bell-curve shape. There is a very slight positive skew, but most values fall near the center.

As shown in Figure 1, the distribution of ORP looks fairly normal with a very slight skew to the right. The minimum ORP of any game was 2.9%, while the highest ORP was 47.1%. But such extreme values are atypical: the vast majority of the values lie tightly around the mean, which is about 22.7%. The middle 50% of the data fall between 17.8% and 27.5%, which means teams that have an ORP below 17.8% are underperforming and teams that have an ORP above 27.5% are exceeding expectations. This interval also shows that half of the data can be captured by a range of less than ten percent. Therefore, we can see that even small percentage changes in ORP can be significant.

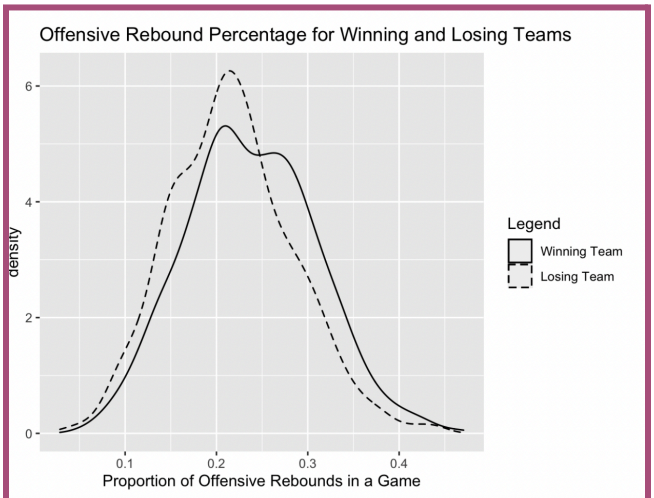


Figure 2: This graph shows the distributions of the ORP for the losing team (dashed) and the winning team (solid) for any given game. Note the vast grey area of the chart. This area shows the overlap between the two distributions.

## Wins Versus Losses

Next, we bisected the data into the ORP of losing and winning teams. While we did find that winning teams have a higher ORP than losing teams, this difference was almost negligible. Based on the data collected, we are 95% confident that the true mean ORP of *losing* teams falls between 21.2% and 22.1%. Similarly, we are 95% confident that the true mean ORP of *victorious* teams falls between 23.4% and 24.3%. Since these intervals don't overlap, we can almost certainly say that the true mean ORP for winning teams is greater than the true mean ORP for losing teams. However, the difference between the mean ORP for winning teams (23.8%) and losing teams (21.7%) is less than 3%.

We plotted the distribution of ORP for winning teams and the ORP for losing teams on the same chart to further illustrate the immense overlap between the two datasets. Figure 2 shows that the curve for winning teams edges out the curve for losing teams, but this difference is marginal. The data implies that a higher ORP is certainly beneficial, but not necessarily more so than any other metric.

## Other Considerations

We also investigated the influence of "rest days," or the number of days between games while in season, on ORP.[1] As shown in Figure 3, we found that ORP stayed pretty constant across all numbers of rest days. This conclusion is also reflected in the confidence intervals we generated for each number of rest days. As shown in Figure 4, all of the confidence intervals for these averages overlapped, which rendered our results insignificant. Therefore, we cannot confidently say that there is a relationship between the number of rest days and ORP. However, further research could potentially uncover a correlation between these metrics.

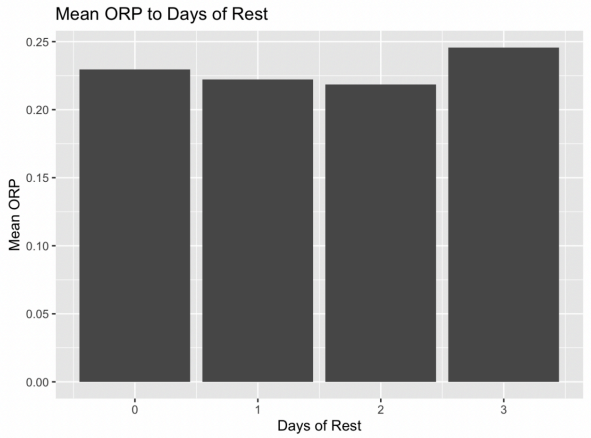


Figure 3: This bar graph shows the relationship between the number of rest days during the active season and average ORP. Mean ORP is pretty constant across the board, showing that there is no significant correlation between days of rest and offensive rebound performance.

## Final Thoughts

While teams with a higher ORP tend to win more games on average, we recommend you do not recruit players *exclusively* based on their excellent offensive rebounding statistics. The difference between the distribution of ORP for winning teams and the distribution ORP for losing teams is minimal, indicating that there must be other factors (e.g., field goal percentage, number of three-pointers, etc) that also significantly affect the game outcome.

| Number of Days of Rest | Lower Bound | Upper Bound |
|---|---|---|
| 0 | 19.2% | 25.9% |
| 1 | 21.1% | 24.4% |
| 2 | 20.5% | 26.8% |
| 3 | 13.8% | 34.8% |

Figure 4: This chart shows the 95% confidence interval for the mean ORP of teams, given the team had a certain number of rest days. For example, we are 95% confident that the interval 19.2% to 25.9% captures the true mean ORP of teams that had no rest time between games.

[1] Games with 120 days of rest were omitted from the analysis. "Rest periods" exceeding 100 days likely indicates time off between seasons, rather than genuine rest days during the active season. Games with 4-9 days of rest were also excluded from the analysis. There were significantly fewer data points available for these days (for example, we only had a single data point for a game with 5 days of rest). While some teams may occasionally rest for more than 3 days, most teams will realistically only experience 0-3 days of rest during the active season.