Braden Holmes

Sabermetrics Final Project

1 May 2019

The Weighted Defensive Score Statistic

There is an enormous number of statistics and measures used to measure a baseball player's offensive numbers, however an equally important half of the game, defense, is often overlooked. Good defense is an essential component of a great player, as bad defense can allow more runs to score than a single good hitter can produce. Thus, it is important to try to measure a player's defensive ability in order to truly determine how great of a player they are.

There are a few commonly used statistics to measure a player's defensive ability. Most notably is the dWAR, or defensive Wins Above Replacement statistic. This tries to compare a player's defensive contribution to the team against an average, replacement level player. That is, a player with a dWAR of 0 is no better in theory than a player from the minor leagues who could replace them. My statistic, Weighted Defensive Score (WDS) is most similar to dWAR, in that it measures a player's defensive contributions and weights it such that an average player has a WDS of 0.

The biggest problem I found with the dWAR statistic is its positional adjustment. Due to every player being compared to a replacement level player regardless of position, the dWAR statistic is unfair to players in positions that require different skill sets than that of a shortstop. The most obvious example of this is Keith Hernandez, who is undoubtedly one of the best first basemen to play the game. In his career, Hernandez accumulated only 0.6 dWAR, meaning they were just barely better than a replacement player, which is obviously false. The problem with the

positional adjustment in the dWAR system is it almost automatically places even mediocre shortstops over great first basemen, under the guise that any of said shortstops could play first successfully. My WDS statistic does not account for any positional adjustment, and it instead compares players only with other players at their position. This keeps things more even, and provides a more useful look at who is the best at their respective position, rather than who is the best overall.

The formula to calculate WDS is fairly simple. To start, we need to calculate an unweighted Defensive Score first. This is made up of a few components. First is the ratio of outs a player participated in over the total number outs they were in the field. This is easily calculated as follows: Out Ratio = (Put Outs + Attempts + (0.5 * Double Plays)) / Total Outs Played. The out ratio is then multiplied by a constant of 200. This calculates how much of a help the player was to their team. The next piece is a measure of total games played, found by Outs Played / 27. This piece is multiplied by a constant of 0.1 and added to the out ratio. Lastly, 0.5 * errors is subtracted from the score. Now, a Defensive Score is calculated for every valid player at a specified position, and the Defensive Scores are averaged to find an average score for the position. Lastly, the average is subtracted from each player's Defensive Score to find their final Weighted Defensive Score.

You might ask, how well does this statistic compare to dWAR? Unfortunately, not very well. As it turns out, defensive ability is incredibly hard to measure, and it's no wonder that arguments about who is the best at each position can go on forever. dWAR uses a lot of very sophisticated data in its calculation, including speed off of the bat, how far the player runs to get it, and other data that I simply do not have much access to. It would be incredibly difficult for me

to create a statistic more accurate, despite its oversimplified positional correction. Due to the lack of detailed defensive data, it was difficult to create any sort of complicated calculation, and instead I ended up with an oversimplified formula. However, that is not to say that the statistic is useless, as many of the top players you would expect to find still appear at the top of the list. If I was to do this project over again, I would choose to create an offensive statistic, as there is significantly more useful data commonly available to create something more accurate and statistically interesting.