

Explanation of Statistic

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CSCI 4831-1

Situational hitting is often very difficult to describe. Oftentimes we like to value a player based on their ability to get the critical base hit or drive in that winning run with two outs. Even Billy Beane sought to evaluate players based on their ability to “get on base”. But what if they don’t? Can a player not be productive if they aren’t getting on base? In 2007, the Rockies had seemingly blew their first chance at a playoff appearance in a dozen years. Down by three in the thirteenth, the situation looked bleak until a string of extra base hits brought the game back into reach for the home team. When the game was tied, it was not a dramatic home run blast to right field that sealed the deal. It was a medium depth fly ball to right field.

Jamey Carroll created a “Productive Out” that allowed Matt Holliday to tag and send the Rockies to the playoffs and ultimately their first world series. While whether Holliday ever touched home is a topic of some controversy (he did), no one can argue that Jamey Carroll did not come through when the pressure was on. He was productive regardless of whether or not he “got on base”.

My statistic, Productive Out Percentage, aims to give credit to those players who are coming through in less dramatic ways. The statistic is simple enough, but does require some explanation. It is calculated as a ratio of Productive Outs (PrO) to Productive Out Opportunities (PrOO). Productive Outs are any out generated by a batter that results in an advanced base runner or a run. Productive Out Opportunities are any at bat in which the batter walks into a base-out state with a runner in scoring position with less than two outs. Therefore it is calculated as follows:

$$PrO\% = Count(PrO)/Count(PrOO)$$

The obvious omissions in the statistic are the “man on first” base state. This was omitted due to the incredible difficulty to move a runner from first to second with an out. If a runner is moved from first to second, it will more than likely take a base hit or a walk. If an out does manage to move a runner from first to second, there is a high likelihood that it resulted from a fielder’s choice. In a fielder’s choice the batter has very little control over which base the fielder will choose to throw to. For this reason this situation has been omitted in order to ensure that the statistic will only reward batters for what they can control.

I do acknowledge that there is an argument to be made for retaining the man on first base state for the sake of evaluating National League pitchers in a sacrifice bunt situation. While it would be worthwhile to look at how effectively a pitcher is helping his own cause by moving up runners, the scope on this situation is extremely limited. I believe this should be left up to its own metrics and not factored in to PrO%. This does, of course, make the statistic far more relevant for position players than it does for pitchers.

The statistic operates under the assumption that all productive outs were created equal. Meaning, that there is no heavier weight that would be assigned to an RBI inducing out (e.g. Jamey Carroll) over an out that simply moved the runner up 90 feet. I did make an effort to find appropriate weights in order to reward batters for creating runs with their productive outs. My attempt at this used run expectancy based on base-out state and the run value of at bats. In essence, instead of counting productive out, each PrO would be represented as the run value of an at bat. All of these values for each PrO would be summed and divided by the number of PrOOs. An example of calculating PrO for a sacrifice fly that drove a runner home from third with no outs can be found below:

$$PrO(Third \rightarrow Home) = (1 + 0.098) - 0.353$$

There were two main reasons that this did not make it into the final statistic. The first one was computer performance. Computing these for every at bat for every player between 2010 - 2016 became extremely computationally expensive. The second was justification. While it felt like a, for lack of a better term, fancy Sabermetric style way to calculate a Productive Outs worth, I could not justify why this way was better than simply looking at the raw chance that a player can create a productive out at all.

Ultimately the aim of the statistic was to evaluate a player's chances to create a productive out and the weights did not aid me in that goal, therefore they were dropped on the cutting room floor. PrO% is meant to give credit to players who are able to come through for their team even without "getting on base". While Billy Beane may have used that line of thinking as the foundation for what eventually brought Sabermetrics into the mainstream, the scope of Sabermetrics can be ever expanding and statistics like PrO% that evaluate other ways players can contribute may very well be on the forefront.