**True Value Baseball: RVT and RVS**

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**Introduction**

There’s no shortage of ways to predict player and team performance; we use various methods of predictive modeling based on regressions, etc. However, let us not forget at the end of the day this is a business. $ matter a great deal, and for many organizations, they are the prism through which a team must first look when making decisions. How much is a run monetarily worth? How does a particular player’s run production compare to an average player? What about his salary? What is a particular player’s net value to a team based on his run production and salary?

**The Value of a Run**

The total number of runs scored, average team payroll, total league payroll, rate of inflation, and value of a run for the past four years in MLB can be used to project the corresponding values for 2017 (Figure 1):

Figure 1



The projected values for each metric are based on a weighted four year total divided by 10, plus the weighted three year delta of that four year span divided by six.

**RVT**

It is wise in the business of baseball to always keep in perspective the past, present and future projected performance of a particular player for a particular age as compared to an average player of the *same age*. This will give us an idea of player caliber, as well as true contract value. We can think of an average player as a ‘threshold’ player, and compare a player’s run production to a threshold player’s run production; runs versus threshold. This concept was introduced in 2003 by Tom Awad in the context of hockey, and was called goals versus threshold, or GVT (Vollman 2016).

A simple expression of a player’s run production versus a league average player of the same age. If you take the mean value for each hitting statistic over the past 24 years, grouped by age from 20 to 40 years old, you can calculate the average delta (season to season variability) for a chosen statistic, and therefore define an average, or threshold player year for each age.

**RVS**

Once we know a player’s RVT, we can calculate his runs versus salary, or RVS, to truly understand his dollar value. Again, this is a concept which was originally introduced in hockey (Vollman 2016). We know that the approximate average MLB player salary in 2017 based on the mean of all 25-man rosters is $4.08M, and the projected value of a run is $201,986.61. Therefore, $1MM will buy you 4.9508 runs. The RVS can then be defined as follows:

RVS is expressed in runs, and if we multiply this by the value of a run, we will know the true net monetary value of a player to his respective team.

Suppose Player A is paid the league minimum of $535k in 2017, and Player B is paid $2.4MM. Both players are the same age. Let us also assume that Player A has created 51 runs for his team, Player B has created 55 runs for his team, and the average player for this age creates 53 runs for his team. The RVS and net monetary value of Player A is approximately 16 and $3.232MM. The RVS and net monetary value of Player B is approximately 10 and $2.020MM. Though Player A has created two less runs than Player B, there is overwhelming value based on difference in player salary.

**Defensive Value**

I have mixed feelings about the true value of defense in baseball. When considering the value of a player, there is often confusion about how much value is attributable to offensive production and how much value is attributable to defensive production. Let’s try and understand this in the context of Defensive Runs Saved, because this is a metric whose currency, runs, is a more tangible concept than other defensive metrics. In 2016, the Pittsburgh Pirates scored 729 runs, while allowing 758 runs. (Fangraphs 2016) Using the Pythagorean formula and an exponent of 1.83, this would approximate a record of 78-84. Their DRS in 2016 was -17. Suppose they actually performed 100% better on this metric, and their DRS was 0, allowing only 741 runs. The approximate record would be 80-82; still not a post-season team, and only two additional wins despite a 100% performance improvement. Additionally, 17 runs are 2.24% of all the runs scored against the Pirates in 2016. Should we focus time and effort on what accounts for 2.24% of the runs, or what accounts for 97.76% of the runs, which is pitching? In my opinion, baseball is a game of hitting and pitching. Fielding and defense is often situational, and more importantly, coachable.

**Discussion**

Clearly understandable metrics for predictive monetary value of run production are absolutely necessary in order to run a fiscally sound organization. One should always maintain an overall gestalt of player performance, which is achieved by understanding the ways in which runs are created and prevented. This will organically lead to a review of where team deficiencies exist, and offer a clear opportunity for the utility of RVT and RVS to improve team performance.

# **References**

Vollman, Rob. 2016. Stat Shot. Toronto: ECW Press.

—. 2016. *Leaderboards-Pirates.* Accessed May 6, 2017. http://www.fangraphs.com/leaders.aspx?pos=all&stats=bat&lg=all&qual=0&type=8&season=2016&month=0&season1=2016&ind=0&team=27,ts&rost=0&age=0&filter=&players=0 .