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Two New Baseball Performance Statistics

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Ever since I was a small child I have been interested in both statistics and baseball, so I guess it was inevitable I would eventually find a way to put the two together. In this short note I'd like to suggest a pair of measures that I feel might be useful in interpreting quality of play: one focusing more on hitting, the other on pitching. Let's start with the one concerning hitting.

The most evident responsibility of the batter is to advance baserunners, including hi/rself. We have a whole host of statistics that indirectly describe effectiveness in this regard: (1) *totals* such as hits, runs, rbis, and home runs; (2) *proportional calculations* such as batting average, slugging percentage, and OPS; (3) *inferential measures* such as WAR; and various weightings related to all three. None of these, however, measure *actual* performance, in the sense of how effective the batter has been in, specifically, advancing runners. Further, these numbers are affected by secondary factors such as varying size/shape of stadium, and even greater variations in team quality. I suggest the following way of dealing with this.

The trick here is to create a *direct* comparison between the maximum number of bases that a batter and existing runners *can* advance in response to hi/r at-bat, and what actually happens. So, let us suppose a batter comes to the plate with runners on at second and third. This means that the maximum number of bases that can be advanced through this at-bat is: 1 (for the runner at third) + 2 (for the runner at second) + 4 (for the batter) = 7. Should the batter hit a home run, all 7 bases will have been advanced, so for that at-bat the statistic would be 7/7, or 1.00. If instead the batter singles and drives in the two runs, the statistic would be (1 + 2 + 1) / 7, or 4/7 = .571. If that batter then steals a base, the calculation would change to 5/7, or .714. Logical conventions for complications such as errors or caught stealings (-1) could be factored in. For periods of multiple at-bats (including whole seasons or even full careers) the 'potential' and 'actual' totals would simply be additive; indeed one could envision a derivative seasonal statistic that would highlight the numerator in the proportion only; this would parallel the notion of rbis, but would be more sensitive to a player's setting-up abilities.

Variations on this theme are also likely possible, and an additional advantage of the approach is that it could be turned around to examine pitching performance, in an exactly parallel way. This kind of measure focuses on the pitcher/batter *interface*, from either direction.

Turning now to the proposed pitching statistic... This one is a little fuzzier in my mind, but basically relates how well the pitcher performs, to how relatively productive the batters who are facing hi/r have performed. If, for example, the pitcher has a BAA of only .225, but has been facing batters whose own batting averages only average .200, the .225

looms as a much less impressive figure. Here too we have a situation in which a proportion is calculated, the real complication being what the numerators and denominators should be; one possibility is using the batters' and pitchers' versions of the first statistic described above. So, and for example, if we have for a particular pitcher a net statistic for batters-against of, say, .250, but the batters involved only have hit to an overall tune of .200, it would be apparent that the pitcher's numbers have been 'artificially' boosted by their only having pitched, on the average, against poor hitters.

Once upon a time, in the manual recording era, the collection of the data required to set up such calculations would have been too trying. Now, however, with much more powerful means of analysis available through electronic programming, this would no longer seem to be a problem. Perhaps someone would like to go ahead and do some experimentation along these lines: not only might fans be interested in the results, but so too the baseball clubs themselves, as this could provide them with more materials relevant to making decisions on the careers of individuals.

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