Setting the Table

Examining the differences in approach versus situation in baseball

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You're a baseball fan score-watching as your favorite team is down 4-2, yet they're racking up hits and guys on base. You then check the RISP stats and notice your team hit 2-10 with runners in scoring position. You then curse your team for whiffing in big spots.

It's difficult enough to get players on base, but bringing them home is a separate challenging endeavor in itself. Timely hitting is a huge factor capable of swinging games; leaving runners stranded is a brutal opportunity missed by a team. There are narratives that can stick to players about whether or not they are "clutch" or if they "show up in big moments," but it's assumed that a player's performance would be equal whether there are runners in scoring position or the bases are empty. Or would it? I decided to investigate not just performance, but other approach-based stats for batters hitting with and without RISP.

Setup

Using FanGraphs, I downloaded CSVs of player stats grouped by stats without baserunners and stats with RISP from 2002-24. I had two separate datasets, one where the minimum PA was 500 and one where the threshold was 1000, but they didn't produce different results. I performed three different tests on each statistic: Wilcoxon rank sum, median bootstrapping, and a t-test if the vector of differences did not fail the Kolmogorov-Smirnov test for normality. Fortunately, all three tests were in accordance for all the different hypotheses.

I initially tested only wRC+, which encapsulates a player's ability to produce runs and it's adjusted for rate and era; YouTuber Foolish Baseball described it as "a fancier OPS+" (On-Base plus Slugging Plus), because it includes wOBA in its formula. However, I believe it is more interesting to also test several statistics that reveal how a player's approach and emphasis change dependent on the bases' situation. Along with wRC+, I tested the following:

- Power stats (Isolated Power (SLG - BA) and Home Run Rate)
- Plate Discipline (Strikeout Rate and Walk Rate)
- On-Base Ability (Batting Average and On-Base Percentage)

I expect there will be differences in a player's approach given the two situations. When the bases are empty, there is less at stake; players are usually more aggressive,

especially power hitters. There are players who are focused on simply getting on base to lead off an inning, those players are called "table-setters." However, the modern lead-off hitter is a player who can both get on base and hit for power. Ohtani, Acuña, Oneil Cruz, Carroll, Buxton, etc. are all examples. Therefore, that emphasis will lead to players hitting for more power but striking out more when the bases are empty. When there are runners in scoring position, plate appearances become very valuable. Selling out for a home run is no longer the strategy. The focus shifts to extending the plate appearance and the inning by any means necessary: Putting the ball in play, choking up the grip on the bat, extra-patient pitch selection, etc. With that being said, let's examine how the tests fared.

Test Setup

$$H_o : \theta_{RISP} = \theta_{Empty}$$
$$H_1 : \theta_{RISP} \neq \theta_{Empty}$$

To test the disparity, I had a choice of subtracting or dividing; I chose to divide:

$$H_o : \frac{\theta_{RISP}}{\theta_{Empty}} = 1$$
$$H_1 : \frac{\theta_{RISP}}{\theta_{Empty}} \neq 1$$

Results

- wRC+: Significant evidence that wRC+ is **greater** with RISP
- Power Stats
  - ISO: Significant evidence that ISO is **less** with RISP
  - HR-rate: Significant evidence that HR% is **less** with RISP
- Plate Discipline
  - K-rate: Significant evidence that K% is **less** with RISP
  - BB-rate: Significant evidence that BB% is **greater** with RISP
- On-Base Ability
  - BA: Significant evidence that BA is **greater** with RISP
  - OBP: Significant evidence that OBP is **greater** with RISP

To summarize:

Greater with RISP	Less with RISP
wRC+	ISO
BB%	HR%
BA	K%
OBP	

Table 1: Summarized Results

Statistical Test Results			Bootstrap		p-value		
Stat	PA	Alt	LB	UB	Wilcox	Normal?	T-test
wRC+	500	Greater	1.021	1.049	2.85E-13	0.117	2.96E-13
	1000	Greater	1.025	1.0606	4.12E-10	0.321	1.79E-11
ISO	500	Lower	0.9487	0.9755	5.89E-06	0.0055	0.0008
	1000	Lower	0.9452	0.977	3.39E-04	0.103	0.0035
OBP	500	Greater	1.0898	1.101	< 2.2e-16	0.558	< 2.2e-16
	1000	Greater	1.092	1.106	< 2.2e-16	0.537	< 2.2e-16
K%	500	Lower	0.919	0.9387	< 2.2e-16	0.743	< 2.2e-16
	1000	Lower	0.91	0.9344	< 2.2e-16	0.682	< 2.2e-16
HR%	500	Lower	0.81	0.849	< 2.2e-16	0.001	< 2.2e-16
	1000	Lower	0.8034	0.8415	< 2.2e-16	0.131	< 2.2e-16
BB%	500	Greater	1.4155	1.4671	< 2.2e-16	3.19E-06	< 2.2e-16
	1000	Greater	1.422	1.4827	< 2.2e-16	0.002	< 2.2e-16
BA	500	Greater	1.0317	1.0448	< 2.2e-16	0.507	< 2.2e-16
	1000	Greater	1.035	1.059	< 2.2e-16	0.835	< 2.2e-16

Figure 1: Wilcoxon, Bootstrap and T-test (if applicable) Results

The specific results of each test for each statistic are shown above. Each test turned out to be significant in either direction. The results match the described strategical differences between attacking a plate appearance when the bases are empty and when there are runners in scoring position. Batters are more patient (higher walk-rate, lower K-rate), more focused on getting on base (higher BA and OBP), and less focused on power[1] (lower ISO and HR-rate). The test results align with the strategy. Combine these factors and wRC+ on average is higher for batters facing a situation with RISP. That is interesting; strategies might shift, but performance would be expected to be equal regardless of the situation. I don't have a confident explanation, but I have an idea. Given the strategy shift where players are more focused on patient and fruitful at-bats, we can assume that batters are more "locked in" when there are runners in scoring position. Again, those at-bats have a lot more at stake for a team's chances to win.

[1] I did perform these tests with slugging percentage (SLG), and the bootstrap tests were not significant. Since BA is significantly higher and ISO is significantly lower in RISP situations; that leaves SLG in a weird spot since it's the sum of BA and ISO, so I decided not to include it.

References

[1] Statistics from 2002-24 were downloaded using FanGraphs' Splits Tool.