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# Analytics and Baseball's New Generation

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## Objectives

This project looks to examine the competitive advantages offered by Sabermetrics, and, specifically, shifting defensive alignments. We will analyze the amount teams in Major League Baseball shifted in 2014 against

- The 2014 regular season final standings.
- Opponent On-Base Percentage (OOBP).

## Introduction

The term Sabermetrics comes from SABR, and acronym for the Society for American Baseball Research. SABR sets out to “search for objective knowledge about baseball” [1]. This means viewing baseball as a set of conditions, rather than a set of rules. Starting in the early 2000’s, teams in Major League Baseball (MLB) have been utilizing Sabermetrics to find ways to score more runs throughout the course of a season. An example of this is the stress put on a high On-Base Percentage by the *Moneyball* Oakland Athletics and General Manager Billy Beane. He argued that more base-runners would lead to more runs scored [2].

In recent years, teams have been utilizing a new defensive alignment, known as the “Pull Shift.” Teams have been positioning field players based on the projected path of a batter ball of the given batter. This has the opposite effect as Billy Beane’s work, as it is intended to reduce the number of base-runners as well as runs given up during a season. The Pull Shift got its name from the likelihood of players hitting the ball to their pull side, or the same side of the field as they bat. We will analyze how utilizing the Pull Shift effected the 2014 season, and if it offered any competitive advantages.

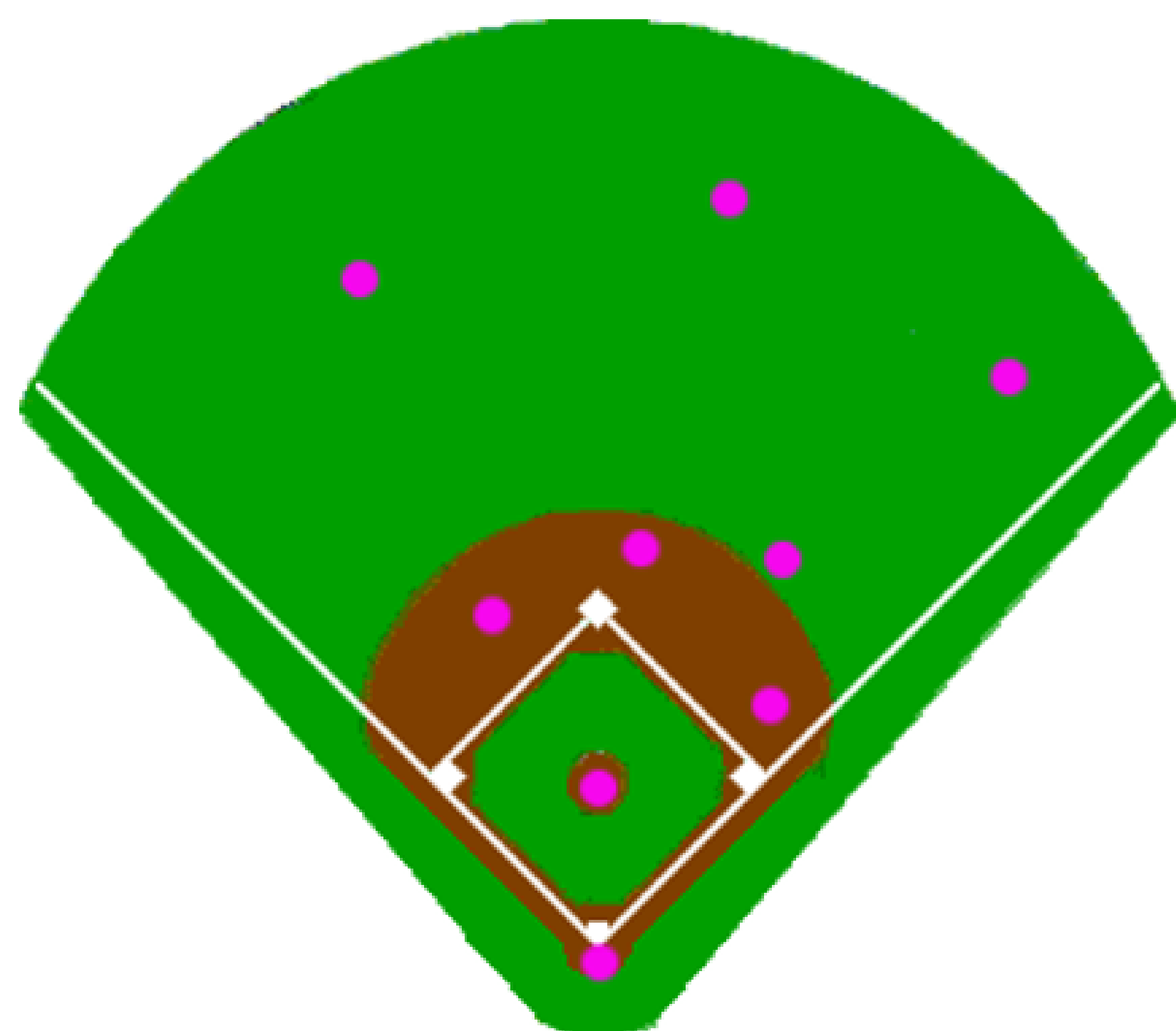


Figure: An example of the Pull Shift alignment, used for a batter likely to hit a ball to the right side of the field

## Methods

In order to see the effect the Pull Shift had on the 2014, the ‘+/-’ statistic was derived. This stat refers to how a team did in the final standings, compared to the predicted results of the season.

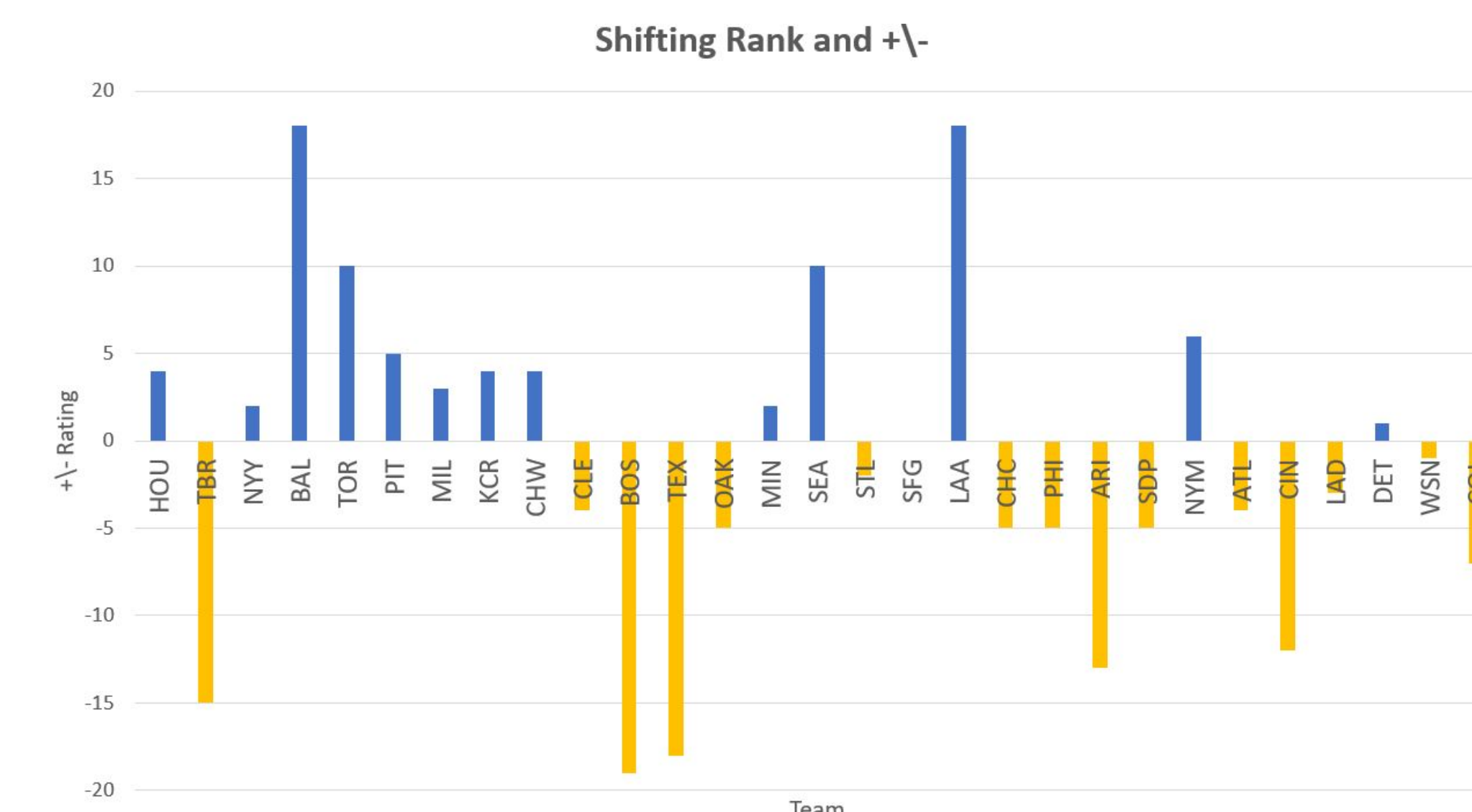
- Teams who moved up compared to their predictions received a positive rating equal to the number of spots they moved up.
- Teams who did not do as well as they were projected to received a negative rating equal to the number of spots they moved down.
- Predictions were taken from *Sports Illustrated* [3].

The following comparisons were then made:

- 1 Shifting Rank and +/-.
- 2 Number of Shifts and +/-.
- 3 Number of Shifts and Opponent On-Base Percentage (OOPB) [4].
- 4 Number of shifts and Runs Allowed per Game (RA) [5].

## Shifting vs. +/- Rating

The following chart shows each team’s movement in the standings, and is organized with the team that shifted the most (HOU) on the left, to the team that shifted the least (COL) on the right.



Out of the top nine shifting teams, all but one, the Rays (TBR), went positive. TBR and the three teams that follow them are all in the same division as the Rays, which could explain their slide. The top ten teams averaged a +/- of +3.4. The middle ten teams averaged a drop of -1.8 spots. The bottom nine teams slid an average of -5.4 spots, which could easily push them out of the playoffs - ending any shot at the World Series.

## Conclusion

The results of the 2014 MLB season were largely affected by the usage of Sabermetrics and the Pull Shift. There is major correlation between teams who used the Pull Shift often and climbing up the final standings. Additionally, we see that Opponent On-Base Percentage trends down as the amount of shifts used went up. Staying ahead of the Sabermetrics curve is paramount to a team giving itself the best shot to reach the playoffs and win a World Series. The new generation of baseball will continue to emphasize trends and empirical analysis as teams look more to Sabermetrics to make decisions.

## Additional Information

For the section titled “Shifting vs. Sabermetrics” there were four outliers removed from the data. These included: The projected two best teams and the projected two worst teams. The two best teams going into the season could afford to shift less and still give up a low OOBP, due to a solid group of pitchers and fielders. The two projected worst teams would likely have given up a high OOBP, regardless of the amount of shifts they used.

## References

- [1] SABR.org. Society for American baseball research, 2017.
- [2] Michael. Lewis. Billy Beane’s brand-new ball game. *San Francisco Gate*, June 2003.
- [3] SI.com Staff. 2014 season previews. *Sports Illustrated*, March 2014.
- [4] Elias Sports Bureau. MLB 2014 team stats. *Espn.com*, March 2014.
- [5] Sports-Reference.com. 2014 Major League Baseball standings. *Baseball-reference.com*, December 2017.
- [6] Travis Sawchik. *Big Data Baseball*. Flatiron Books, New York, 2015.

## Shifting Works!

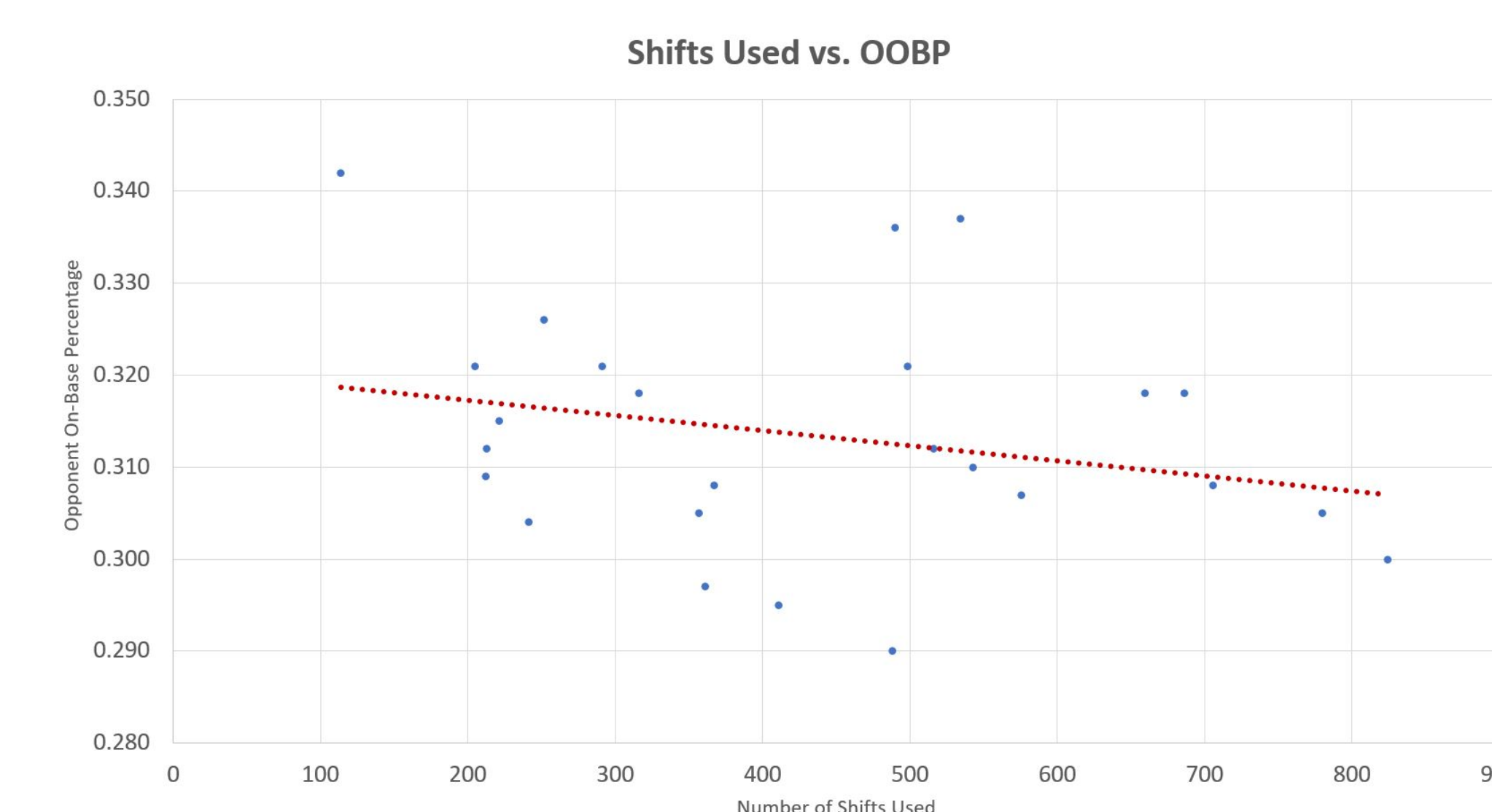
The ten teams who shifted the most moved up, on average, 3.1 spots from the projected to final standings in 2014. The middle ten fell -1.8 spots, while the bottom nine dropped -5.4 in the final standings—causing major changes in the playoff picture.

## Shifts Used in 2014 Season [6]

Rank	Team Name	Number of Shifts
1	Astros	1,341
2	Rays	824
3	Yankees	780
4	Orioles	705
5	Blue Jays	686
6	Pirates	659
7	Brewers	576
8	Royals	543
9	White Sox	534
10	Indians	516
11	Red Sox	498
12	Rangers	490
13	Athletics	488
14	Twins	478
15	Mariners	411
16	Cardinals	367
17	Giants	361
18	Angles	357
19	Cubs	316
20	Phillies	291
21	Diamondbacks	252
22	Padres	241
23	Mets	221
24	Braves	213
25	Reds	212
26	Dodgers	208
27	Tigers	205
28	Nationals	201
29	Rockies	114
30	Marlins	n/a

If shifting presented an advantage to teams, we would expect the *Astros*, *Rays*, *Yankees*, *Orioles*, and *Blue Jays* to move up in the rankings, and the *Rockies*, *Nationals*, *Tigers*, *Dodgers*, and *Reds* to underperform. No data on the number of times the Marlins shifted was available. The following section compares the frequency of shifts used to +/- ratings.

## Shifting vs. Sabermetrics



In the scope of Billy Beane’s *Moneyball* tactics, shifting appears to be an effective option to reduce OOBP. Six out of the nine teams who employed more than 500 shifts had an OOBP lower than the league average, 0.314 [4]. Four of those six dropped below 0.310. On the opposite end of the spectrum half the teams below 300 shifts had an OOBP above 0.320. A 0.010 difference equates to sixty-one less base-runners throughout the course of a season. That means sixty-one less opportunities for solo homeruns to become 2 or 3-run homeruns, sixty-one less times a pitcher has to worry about a base-runner stealing, and sixty-one more potential outs—adding up to a lot less runs allowed.

## Acknowledgements

Inspiration from this project comes from the book *Big Data Baseball* by Travis Sawchik. Information on the number of shifts used by each team was taken from this book via Baseball Info Solutions. The figure of the shift was taken from CreativeCommons.org and is labeled for reuse.

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