

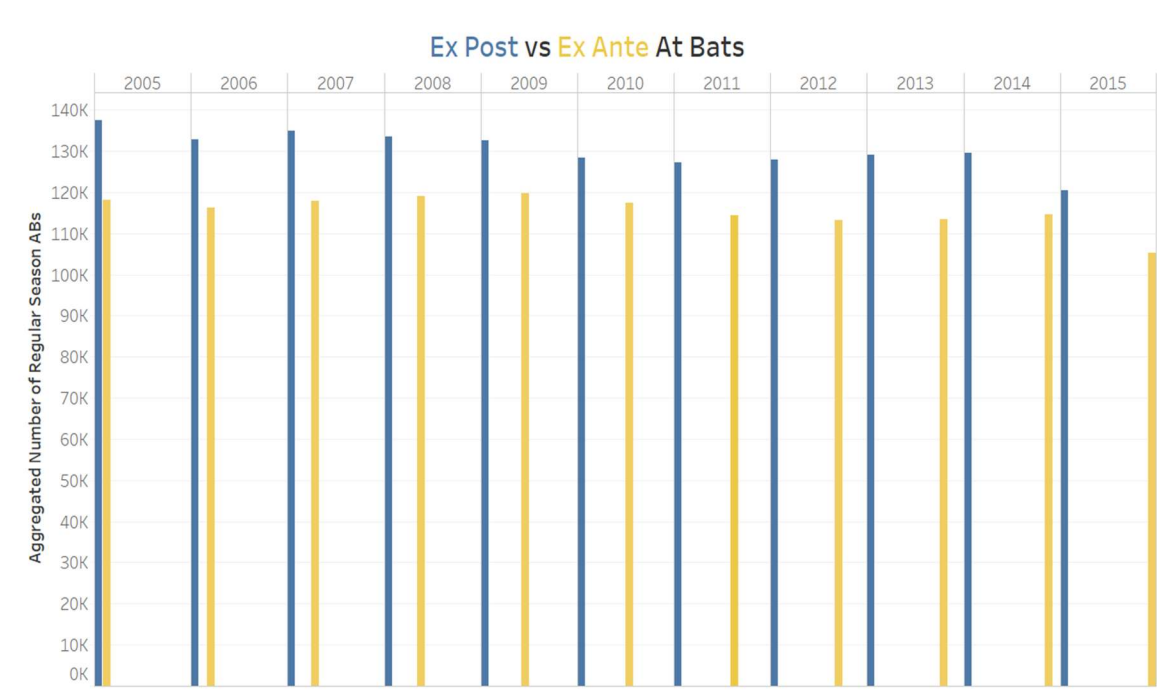
Nick Keohan

Project Draft: Outline of Ex Post vs Ex Ante Batting Metrics and The Impact on Defensive Metrics of the Left Handed Batter Shift

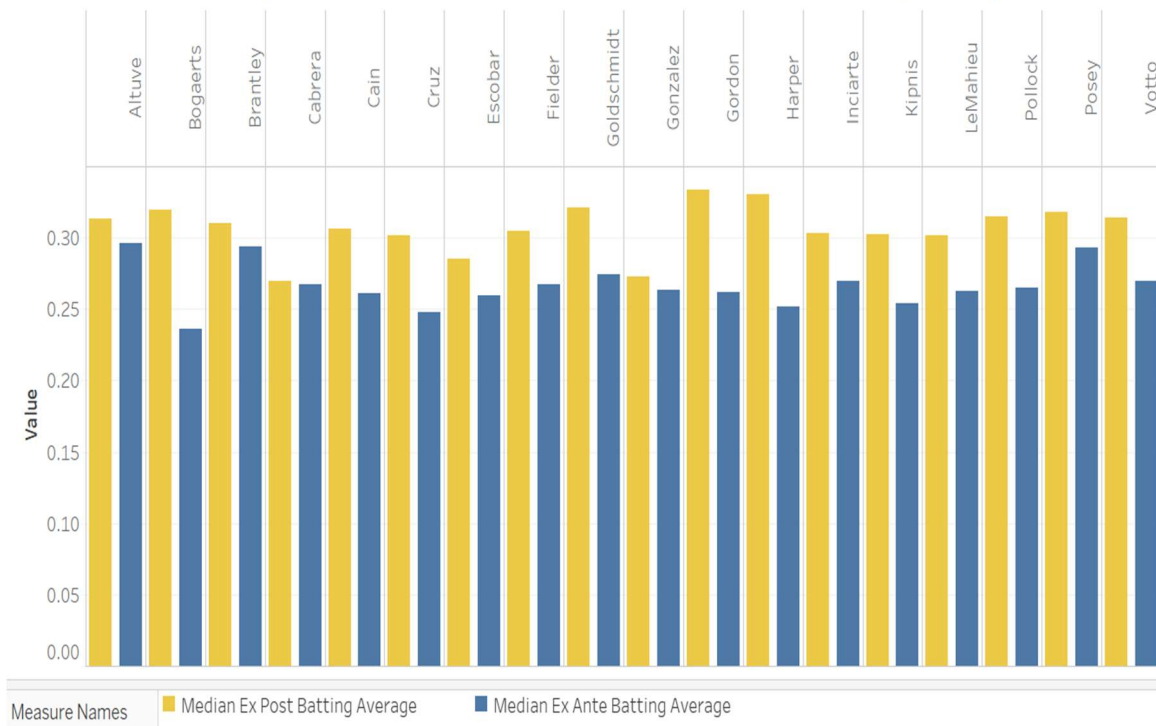
Data Overview:

The projected or ex ante batting statistics were obtained from baseballguru.com and span from 2005 through 2020. The data sets contains player level data with the variables of interest mAB (Forecasted at bats), mAVG (forecasted batting average), mH (forecasted hits), mOBP (forecasted on base percentage), and mSLG (forecasted slugging percentage). The data sets from baseballguru.com also contains the same player identification as in Sean Lahman's datasets allowing for an easy merge of data. These variables will be compared to the player level data obtained from the Sean Lahman data set. The Lahman data set contains the variables of interest AB (at bats), H (hits), 1B (singles), 2B (doubles), 3B (triples), HR (homeruns), HBP (hit by pitch), SF (sacrifice fly) and BB (walks). These extra variables are required from the Lahman data set because slugging percentage and on base percentage are not explicitly supplied. $\text{Slugging Percentage} = (1B + 2B*2 + 3B*3 + HR*4)/AB$ and $\text{On Base Percentage} = (H + BB + HBP)/(AB + BB + HBP + SF)$.

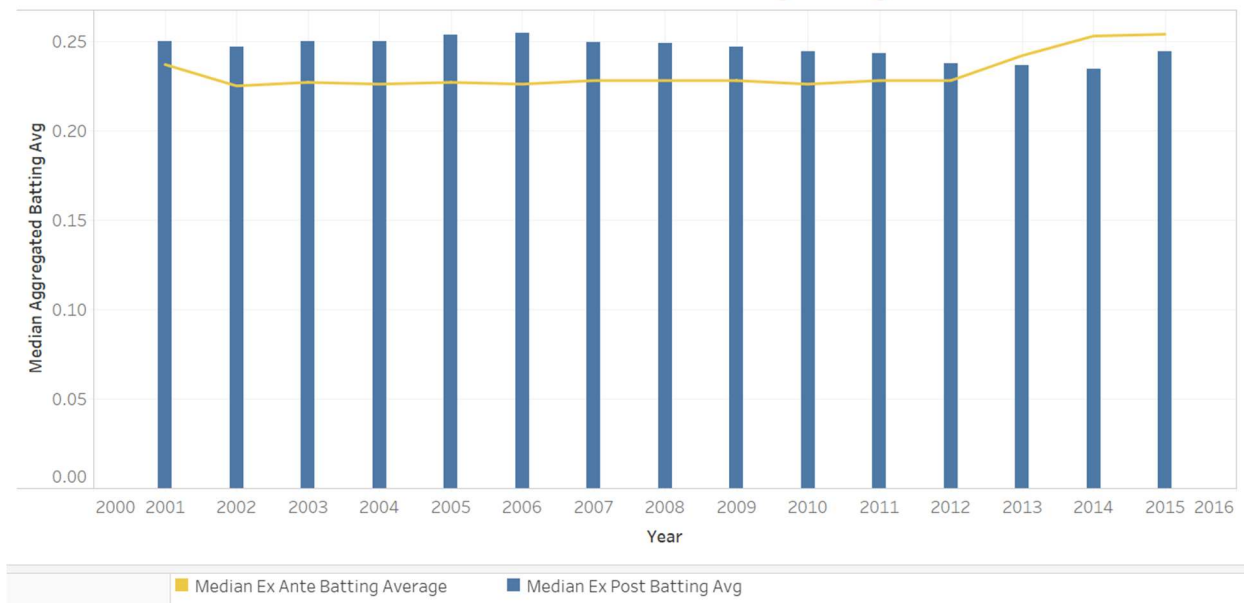
In order to adeptly analyze ex post verse ex ante baseball offensive statistics, special attention will be placed on analyzing the at bats (AB) statistics. The metric AB is considered one of the most difficult of metric to predict in baseball due to its multitude of confounding factors. This metric is also a key component of all forecasted batting statistics making its impact on the overall batting predictions extensive. By observing the accuracy of these ex ante verse ex post AB statistics, an estimation of the overall accuracy of forecasted batting statistics can be obtained.



2015 Players with at least 502 ABs Ex Post vs Ex Ante Batting Average



Median Ex Post vs Ex Ante Batting Average



Based on the preliminary bird's eye view results for some of the variables of interest, it appears that forecasts league wide, have historically under-estimated batting averages. This coincides with the fact that aggregated forecasts of At Bats have under shot the observed aggregation of

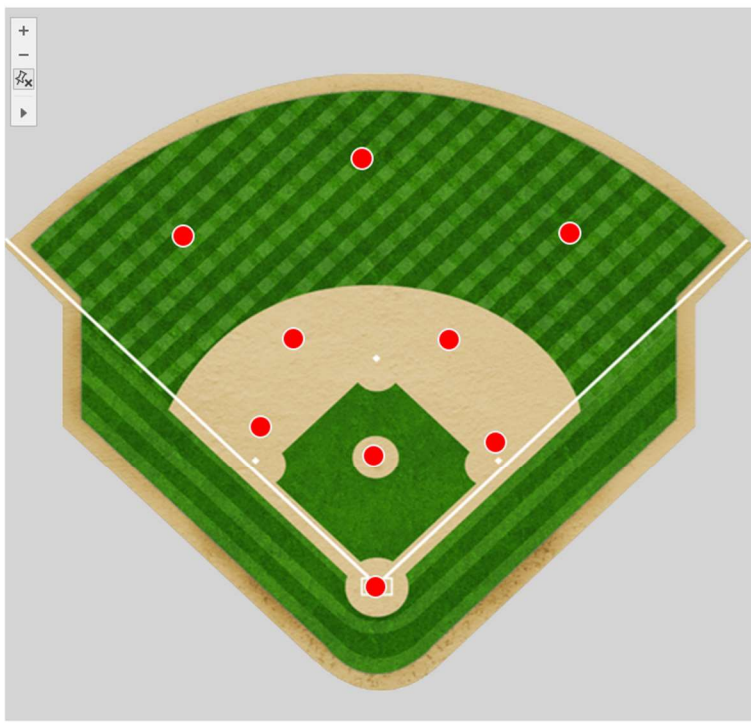
At Bats. Further research into the number of players these forecasts cover as well as the number of player the Lahman data set contains are required to draw any significant conclusions from these visuals.

In order to study the impacts on defensive metrics from baseball teams implementing a shift, the variables PO (putouts or when a defensive player records an out), A (assists or when a fielder touches the ball before a putout is recorded by another fielder), and E (errors or when a fielder fails to convert on a play that an average fielder should have made) are of significance. These variables will be observed from 2000 to 2019 with special attention given to the Baltimore Orioles, Tampa Bay Rays, and Houston Astros. These teams are considered the perennial leaders in implementing defensive shifts, with the vast majority of these shifts occurring with left handed batters.

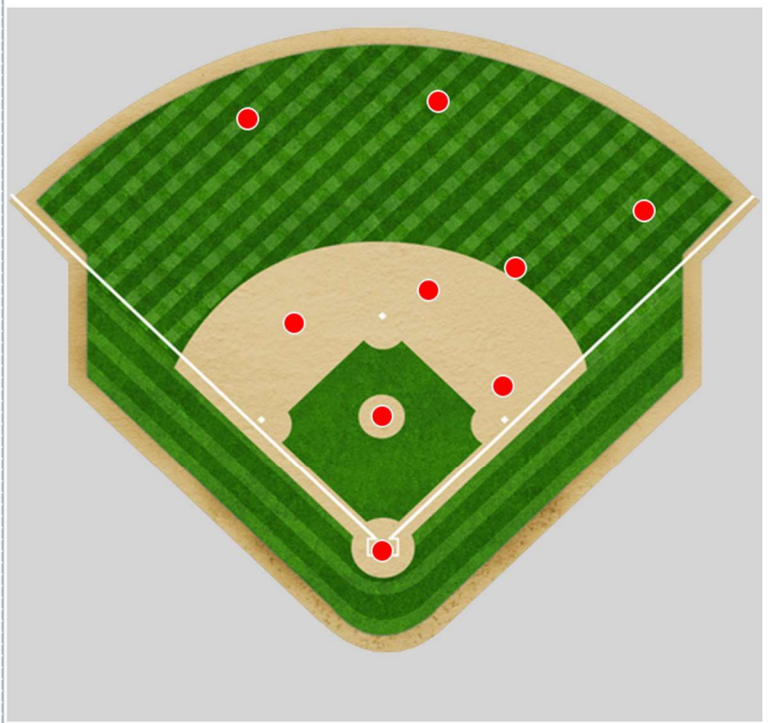
While the shift has been around since the early 1920s, its prevalence has drastically increased in recent decades. Prior to the Rays popularized use of it in 2006, the shift was only used for elite powerful left-handed hitters that had a strong tendency to pull the ball. In 2016, the Houston Astros performed a defensive shift on 52% of the left handed batters the team faced. In the same year, the Rays implemented the shift for 35% of the batters they faced. In 2019, the Houston Astros performed defensive shifts on 77.% of At Bats, the Orioles 62.3% of At Bats, and the Rays 44.1% of At Bats against lefties.

The reference lines on each of the team graphs indicates the year in which the respective teams began significantly implementing the leftie defensive shift into their playbooks. Based on a preliminary analysis of defensive metrics for the three forementioned teams, it appears that each team experienced a decrease in the number of errors they committed throughout a season. This trend is most apparent with the Houston Astros. The number of assists also appears to make a steady decline after each teams' implementation. This could be attributed to more line drive or fly balls being caught due to the shift. This decline in assists also coincides with a slight increase in putouts for each team, backing up the claim that the shift has led to an increase in the number of fly balls or line drives being caught.

Standard Defensive Positioning



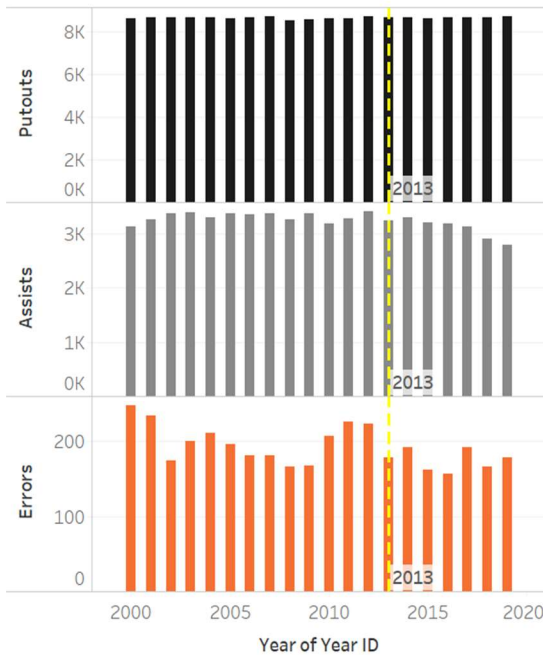
Left Handed Batter Shift



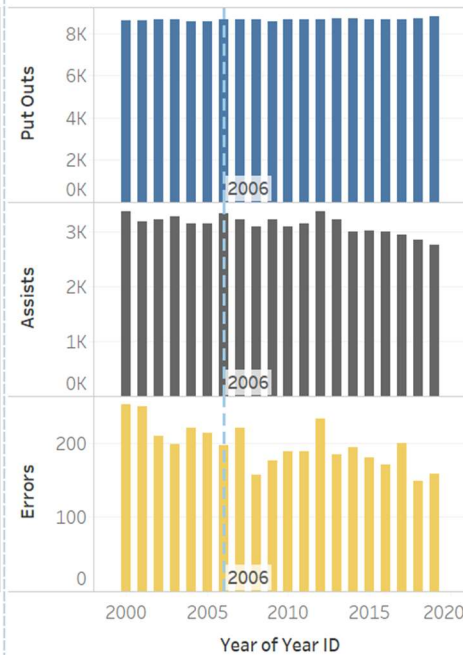
Fielding Metrics For the Top 3 Adopters of the Defensive Shift

reference lines indicate the year the leftie shift was adopted

Baltimore Orioles



Tampa Bay Rays



Houston Astros

