

The new statistic that was created is showcased through a Jupyter Notebook. The first module will prompt the user to enter a name into a text box. This name will be looked up into the database, and then all the graphs will be displayed based on the name.

This new statistic I call Extended Weighted On Base Average, a stat which is meant to use wOBA in order to better understand a player's trends as well as possible future performance. eWOBA relies on changing the weights of wOBA so that they consider not just the current year but later years. This turns wOBA from a context-free statistic to one that requires future data to understand. We use data from the future as well as data from the current year in order to calculate the weights for wOBA, rather than only the year which is being examined.

In this analysis, eWOBA is used along with wOBA in order to better understand what how exactly the change is significant. Currently, the difference between the eWOBA and wOBA are examined in order to see the small changes that occur between the two, since wOBA is already a fairly small number to work with, using differences in the tenths and hundredths place, eWOBA examines the changes within the thousandths place for the most part.

Since eWOBA has similar statistical origins to wOBA, the values will be fairly close. The correlation between them thus is very strong. The applications of this are a bit different though. wOBA, only is able to give statistics for that current year, while eWOBA can potentially give ideas of how they do in the future.

In order to keep it simple so there wasn't too much data, I created the weights based on the next 5 years given any year, as well as the next 10 years given any year. This meant that we had to only take player from 10 years ago or older, meaning since the current year was 2018, we could only take players from 2008 or before. Further examination can be done on the smallest amount of years or perhaps a different way of analyzing the data so that we can use more recent players, and thus have it be more effective for obtaining potentially strong players.

For now though, with this data I think we can use it to examine how well a player could have done in years where they didn't actually play. Examples being players who were injured or players who had retired already.

As years go by it's expected that players will get better and better, that means that if we compare a player's wOBA with the eWOBAs which include the next ten years statistics, the eWOBAs for any given year should generally be less than the wOBA. In order to analyze this, we look at the difference between the wOBA and eWOBAs. A positive difference means the wOBA is higher than the eWOBAs, which is what is expected as an eWOBAs should in general be lower. When we looked at the average difference over the years, it's seen that 37/58 years have an average difference above zero. With so much noise in baseball, it is difficult to tell if this is a direct confirmation that confirms our conjecture, but it can be noted that it does agree with it.

Since the difference should be generally positive, this also gives a telling sign for players who have a closer to 0 difference, or even those with a negative difference. It means for those years they had played extremely well and were still extremely consistent. We'll look at Barry Bonds as a good example of a player who had an excellent hitting career.

We can see that in the early 90s, Barry Bonds's Difference was much higher. We can also recognize that his wOBA was increasing at a similar rate until 1992, when his performance dropped comparatively. The difference dropped at this point and stayed at near 0 during his extremely high performance years in the 2000s, even going negative at some points. This is showing that Barry's performance during those years were significantly better compared to the other players. We can use the graph that compares differences between the individual player and the averages for that year to double check that. From the looks of it, Barry Bonds tended to have higher highs and lower lows, although to be fair, when we compare just general wOBA of Barry Bonds compared to other players, he did significantly better. At the end of 2008 though,

his difference does surpass that of the average, meaning it may have been a good point to have ended, as the projections based on eWOBA show that he would not have performed as well.

Because eWOBA is trying to capture projected values, most stats that look into projections will be used similarly to eWOBA. Stats such as projected runs or other projected stats use trends in order to see what future performance may potentially be like. eWOBA could potentially be used as a projected based on trends just like wOBA, but eWOBA does give the option to not worry about past performance. Of course, at the trade-off, it requires understanding of what happens in future plays, but if this can become more refined it may be able to use less future context.

It's interesting to see how players performed in comparison to their future years regardless. Of course, with baseball having such huge changes year by year, it's difficult to optimize completely, but looking at the past data can be fascinating in terms of how teams have made decisions on who to keep and who stays.