Out of Left Field? An Estimation of the Effect of Bullpenning on Team Performance in Major League Baseball: Evidence from Tampa Bay Rays

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A “bullpen day”, or “bullpenning”, is a newly employed technique in Major League Baseball that consists of utilizing several pitchers in short stints, as opposed to the traditional method that uses a starting pitcher from the beginning of a game. Similar to Moneyball, which is a term used to describe how a baseball team improves performance by using specific statistics to guide their decision-making (Lewis, 2004), bullpenning may have the potential to alter the currently accepted baseball system. The Tampa Bay Rays utilized this approach sporadically during the 2018 and 2019 regular seasons, which resulted in an overall record of 90-72 and 96-66 respectively. As the Tampa Bay Rays have experienced winning seasons and bullpenning has been occasionally used by several teams (e.g., Brewers, Dodgers, and Red Sox), further investigation of the use of this strategy is needed to determine the impact of bullpenning on team success. While previous scholars looked at various determinants of the production function in baseball (Chen & Johnson, 2010; Scully, 1974), the effect of bullpenning has never been empirically tested. Thus, the purpose of this study sought to estimate the effect of bullpenning on match outcome (i.e., win/loss) as well as opponent’s batting performance (i.e., batting average (BA), on-base percentage (OBP), and slugging percentage (SLG)).

The dataset included a total of 162 observations of Tampa Bay Rays’ 2018 regular season. A set of independent variables included not only the use of bullpenning, but also a vector of Tampa Bay Rays’ and opponent’s pitching and batting statistics. With these variables, logistics regression and beta regression were separately estimated to analyze the effect of bullpenning on match outcome and opponents’ batting performance. The result from logistics regression showed that the bullpenning strategy was not the key determinant in explaining game outcome (after controlling for other variables) but overall the Rays’ pitching and batting performance were statistically significant. Beta regression also showed that opponents’ batting statistics were not significantly affected by Rays’ bullpenning.

The findings of this study indicated that there was no significant effect of bullpenning on match outcome and opponent’s batting performance. Despite its inconclusive effect, Rays’ innovation was copied by the Oakland Athletics in American League wild-card game against Yankees, is currently ongoing in 2019 postseason, and expected to continue next season. In addition, the bullpenning strategy is not limited to the U.S. baseball market, it has become a new trend in Japanese and Korean professional baseball leagues, which are the second and third largest revenue-generating baseball markets in the world after MLB (Jang & Lee, 2016). As bullpenning is an emerging trend in the baseball world, MLB will initiate a new pitching rule in 2020 that every pitcher needs to face a minimum of three batters (Perry, 2019). Therefore, there is still room to investigate the degree to which bullpenning affects the course of the game. Results from this study have implications for baseball general managers and coaches who are considering the replication of the 2018-2019 Tampa Bay Rays and their bullpenning strategy.