Using Hierarchical Linear Regression Modelling to Analyze Attendance Determinants of National Basketball Association (NBA) and Major League Baseball (MLB)

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According to the ESPN’s annual attendance reports (2018), the attendance of major professional sports leagues in North America, after the recession in 2008, declined for three seasons. After this period, the attendance of the National Football Leagues (NFL) and the National Hockey Leagues (NHL) has been fluctuated inconsistently, while the National Basketball Association (NBA) has shown a steady growth. In opposition to the NBA, Major League Baseball (MLB) attendance has continuously decreased during the same period. While the market size of each league has grown due to various revenues, including the growth of broadcasting rights, the different attendance trend among leagues is a worthy topic to investigate, especially the contrast between the NBA and MLB. Therefore, the purpose of the present study was to analyze which attendance determinants significantly influence the single-game attendance of the NBA and MLB during the 2006-17 regular seasons (from the 2006-07 to 2017-18 season for the NBA).

Schofield (1983) introduced the four categories of attendance determinants (i.e., economics, demographics, game attractiveness, and residual preferences), and previous studies (e.g., Hansen & Gauthier, 1989) have analyzed various determinants based on this classification. The present study also used the attendance determinants in these four categories. In order to investigate the determinants of the attendance in the NBA and MLB, the individual game attendance of all 30 MLB and 30 NBA teams over the 12 regular seasons was adopted as a dependent variable (N(MLB)= 29051, N(NBA)=14504). Further, because the attendance data is nested by season and team, this study analyzed using the three-level hierarchical linear regression modelling (HLM) with 12 game-level and 13 season-level attendance determinants including two longitudinal (i.e., Progress and Season) and two quadratic terms (i.e., Progress^2 and Season^2).

The data structure analysis confirmed the hierarchy of both data sets by three levels (i.e., within each season, between seasons, and between teams). Also, all 12 game-level variables (i.e., home team and visiting team’s qualities, game uncertainty, visiting team’s payroll, final rank, star players, team age and championships, rivalry game, weekend game, Progress and Progress^2) were significant predictors of the attendance in the both leagues (p<.05). While the MLB attendance was influenced by home team’s payroll and number of star players (p<.05), the home team’s final rank, star players, championships, and home city’s population and income level significantly influenced the NBA attendance (p<.05). Further, the positive estimate of seasonal quadratic term (i.e., Season^2) confirmed the recent increase in NBA attendance (p<.001).

The present study confirmed the influence of attendance determinants examined in previous studies (e.g., Ferreira & Bravo, 2007) and introduced the advanced statistical methodology, such as a three-level HLM approach. In addition, for sport industry practitioners, the findings in this study provide statistical clues about which attendance determinants are significant and how to increase the number of spectators in MLB and the NBA.