Examining the Factors Impacting Attendance in Minor League Baseball: An Analysis of the Midwest League

Adam Riplinger, Northern Illinois University
Anthony Sirianni, Northern Illinois University
Steven Howell (Advisor), Northern Illinois University

Marketing Abstract 2014-247
Saturday, May 31, 2014 9:20 AM Poster (Urban Room)

In 2013, Minor League Baseball (MiLB) drew approximately 51.6 million fans (Ballpark Digest, 2013), which, for many clubs, accounted for a significant part of their revenue during a given season. Though independently owned and operated, the majority of these teams are directly affiliated with a Major League Baseball parent club. As such, the overarching goal of each franchise is two-fold in nature. First, they serve as a training ground for developing and preparing prospects to be successful for their parent club at the major league level. Second, they operate as a business by generating revenue (e.g., through gate receipts, merchandise sales, and other outlets) and maximizing profits. Given these two goals, understanding the factors that impact sporting event attendance is an important topic in both the academic literature and practical applications. Therefore, the purpose of the present study is to examine the different factors that impact attendance for teams participating in the Midwest League.

Beginning with the work of Demmert (1973) and Noll (1974), a number of studies have examined the different factors that have impacted gate attendance in professional baseball such as: promotions (e.g., Hill, Madura, & Zuber, 1982; McDonald & Rascher, 2000; Boyd & Krehbiel, 1999, 2003, 2006), new stadiums (e.g., Coffin, 1996; Clapp & Hakes, 2005; Zygmont & Leadley, 2005), work stoppages (e.g., Schmidt & Berri, 2002; Coates & Harrison, 2005), and team success (e.g., Baade & Tiehan, 1990; Gitter & Rhoads, 2010a). These analyses, however, have focused on professional baseball at the major league level, largely ignored the impact of in-game weather conditions; and relied predominately on the analysis of aggregate-level (i.e., annual) data (Branvold, Pan, & Gabert, 1997; Gitter & Rhoads, 2010a, 2011). Consequently, our understanding of the factors that impact attendance at both the minor league and individual game level is still quite limited.

Only a few studies have examined the impacts of promotions on individual game attendance within the context of Minor League Baseball. Siegfried and Eisenberg (1980) were the first to examine promotional activities to explore attendance for MiLB and found that promotions significantly increase fan attendance over a given season. More recent analyses have also explored the impact of internal factors (e.g., promotions and special events) and external factors (e.g., demographic variables and weather conditions) on attendance at minor league baseball games. These studies have examined the Carolina League (Cebula et al., 2009), Eastern League’s Trenton Thunder (Gifis & Sommers, 2006), NY-Penn Baseball League (Paul et al., 2007), and South Atlantic League (Paul et al., 2009). Across these studies, the findings reported included a number of consistencies, as well as some interesting differences. For example, fireworks have been found to increase minor league game attendance (e.g., Gifis & Sommers, 2006; Paul et al., 2007; Paul et al, 2009). Conversely, when examining day of the week, Paul and colleagues (2007) found that relative to weekend games, weekday games predicted an increase in attendance, while results from Cebula and others (2009) indicated the opposite (i.e., lower attendance for weekday games).

The present study seeks to build on prior research in this area by investigating the impact of weather variability, time-related effects, and promotional efforts on attendance in Minor League Baseball; specifically for teams participating in the Midwest League, a Single-A level league, during the 2007 through 2012 seasons. The present study contributes to this area by exploring how in-game discounts, special events, promotional giveaways, and ticket price (factors that are generally under a team’s control -- i.e., internal factors), and weather conditions and temporal factors (factors that are relatively out of a team’s control -- i.e., external factors) affect attendance in Minor League Baseball. Moreover, by exploring first-order interactions, we examine the extent to which these internal promotional factors can potentially offset the negative impacts associated with the external weather and timing factors. In other words, we explore whether promotional factors can provide fans with a sufficient incentive to attend a minor league baseball game despite the disincentives resulting from poor weather conditions and suboptimal timing.
Using multiple regression analysis with ordinary least squares, we examined a pooled dataset of teams participating in the Midwest League during the 2007 through the 2012 season (n = 6,016 games). Individual home game attendance statistics were drawn via game box scores from each teams’ official website and these raw attendance figures were recalculated as a percentage of the team’s home stadium capacity; which served as the dependent variable in our analysis. In total, 11 independent variables were included in the model. Five were considered as external factors (temperature at the game’s opening pitch; a quadratic of temperature at the game’s opening pitch; and a rain, weekend, and opening day/final home page binary dummy variable); while the remaining six were classified as internal factors (in-game discounts; low- and high-valued promotional giveaways; special events; postgame fireworks; and ticket price). The independent variables explained 55.7% of the model’s variance (R² = 0.557) and the overall model was significant (p < 0.001).

Regression estimates from the external factors appeared to be consistent with what would generally be predicted. First, the coefficient on the rain dummy was negative, suggesting that rain predicts a 10.2% decrease in attendance to a Midwest League baseball game. Second, for each degree increase (i.e., 1°F), a 4.5% increase in attendance is predicted. Third, the coefficients for the weekend and opening (day/final home game dummy variables were both positive, indicating that a 12.5% increase is associated with a weekend contest (i.e., Friday, Saturday, and Sunday), while a 19.4% increase in attendance is predicted by the game being either the first or final home game of the season. All external variables were significant at the 1% level or better (p < 0.01). Conversely, the estimates for the internal factors were also consistent with expectations (with only one exception). Two of these internal predictor variables were negative. As expected, each dollar increase in the average price of a ticket predicted a 6.7% decrease in attendance; however, contrary to our expectations, an in-game discount predicted a 4.1% decrease in attendance. The four other internal predictor variables were positive: (1) special events (i.e., concerts, family nights, etc.) predicted a 6.1% increase; (2) low- and high-valued promotional giveaways were associated with a 11.7% and 12.3% respective increase; and (3) a post-game fireworks display suggested a 24.7% increase in attendance. All internal variables were significant at the 1% level or better (p < 0.01).

In addition to exploring these main effects, we also examined the extent to which the particular internal factors (i.e., promotions and special events) can mitigate the negative impact of the external factors examined (i.e., weather conditions and temporal factors). The interaction terms increased the R-square value of the model from 0.557 to 0.633. In particular, we find that both low- and high-priced promotional giveaways, when placed on a weekday, predicted a 17.6% and 16.5% increase in attendance respectively; thus suggesting that promotional giveaways create an additional incentive to attend a game during the work week (when the opportunity costs for leisure time are generally higher). However, these same internal factors did not offer the same incentive for weekend games. Interestingly, a postgame fireworks display did not create an incentive to attend when there was rain during the game as this interaction term predicted a 9.4% decrease in attendance.

The present study offers practical findings which address important issues for sport researchers, practitioners, and franchise executives. Specifically, the findings show that promotions and special events play an important role in encouraging game attendance for the Midwest League. In particular, promotions involving fireworks and high-valued merchandise giveaways displayed the greatest impact on attendance. The findings also show that weather and temporal variables impact attendance. Team executives could leverage these findings to forecast demand for upcoming games and series, which could be used to modify staffing plans and adjust concession orders.