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Amanda Schoenrock will graduate from UW Oshkosh in December 2009 with degrees in economics and marketing. Her study began in Dr. Marianne Johnson's economics course. In the future, Amanda would like to do further research that combines her background in economics and marketing.

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Abstract

What are the effects of promotions on attendance at Major League Baseball games? To examine this question, I collected data from each of the Milwaukee Brewers' 81 home games during the 2008 regular season. Several independent variables relating to the type of promotion, as well as variables relating to the day of the game, winning percentage of both the home and visiting teams, and whether or not the game was a marquee game, were analyzed. Promotions were grouped into four different categories: bobblehead promotions, giveaway promotions, coupon promotions, and event promotions. Results show that promotions have a positive effect on attendance, with bobblehead promotions being the most effective form of promotion, followed by giveaways, events, and coupons.

Introduction

What are the effects of promotions on attendance at Major League Baseball (MLB) games? While the main objective of MLB teams is to win games and, ultimately, the World Series, teams also seek to earn profits. One way teams do this is through ticket sales, and promotions increase attendance. However, promotions are both complex and important to sports marketing executives.

A number of factors, both on the field and off, affect an individual's decision whether or not to attend a MLB game. MLB teams have more home games (81) than the National Basketball Association (41) and the National Football League (8) combined. Consequently, fans are less likely to consider each game critical to attend. Because ticket sales are the main source of revenue for many teams, understanding which factors are most attractive to fans is crucial to a team's survival. Given the current economic situation, finding ways to sell tickets is even more important. Attendance across all 30 MLB teams is down about 4.4% through May 12, 2009, compared to the same time in 2008, and nine of those teams have seen an even more significant decline in attendance (Singer, 2009).

To determine the effects of promotions on attendance, I collected data from each of the Milwaukee Brewers' 81 home games during the 2008 regular season. I analyzed several independent variables that measured the effects of the day of the game, winning percentage of both the home and visiting teams, and whether or not the game was a marquee game. I grouped promotions into four different categories of dummy variables: bobblehead promotions, giveaway promotions, coupon promotions, and event promotions. Results show that promotions have a positive effect on attendance. However, the type of promotion is significant: Different types of promotions have different effects on attendance. Bobblehead promotions are the most effective form of promotion, followed by giveaways, events, and coupons. In its July 13, 2009, issue, *ESPN* ranked the Brewers fourth for the highest-rated promotional giveaways among all 122 teams from the four major U.S. sports. The Brewers earned their ranking due to their frequent use of bobblehead promotions (Keating, 2009).

Literature Review

One of the most important variables that can be controlled by marketers is the promotion variable. Bobblehead, baseball card, and poster giveaways are common. However, some marketers have designed newer, more unique promotion ideas, including Calculator Day at Yankee Stadium, Joe Mauer Fishing Lure Day at the Metrodome, and Sleepover at Chase Field Night (Gallo, 2008). Several studies have been conducted to discover what factors bring fans to the ballpark.

Boyd and Krehbiel (2003) conducted a study of three different types of promotions and their effect on attendance. The dependent variable in their study was attendance. The study's independent variables included three types of promotions: price discounts, giveaways, and special features. Other independent variables included temperature, winning percentage of both the home and visiting teams, time of game, day of game, and whether or not the opponent was a rival. Boyd and Krehbiel collected data from home games for six MLB teams during the 1999 season.

In addition, Boyd and Krehbiel (2003) found that promotions had a positive effect on attendance for each of the six teams studied. The average increase in attendance ranged from 1,963 for one team to 13,151 for another team. Two of the study's three promotion variables, giveaways and special features, proved to be statistically significant. Boyd and Krehbiel found evidence of diminishing returns when two or more factors that increase game attractiveness occur in a single game. While promotions at games against a rival showed no increase in attendance, promotions at weekend games showed a positive increase in attendance but were not significant for all teams. Boyd and Krehbiel concluded that a weekend game versus a rival is already an attractive game, and, therefore, promotions will not significantly increase attendance for such games.

McDonald and Rascher (2000) examined the effect of promotions on attendance as well as the marginal impact (the change in attendance resulting from the addition of a promotion) on attendance of additional promotions. They collected data from 19 MLB teams during each of the teams' home games during the 1996 season. However, the source of the data was unclear. The dependent variable in this study was attendance. The independent variables included 28 time-varying variables, such as the teams' winning percentage and the time of the game, and 12 time-constant variables,

such as the cost of promotional items and stadium seating capacity. McDonald and Rascher found that promotions increase attendance by an average of 14%. They reported a positive correlation between the number of promotion days and the total seasonal impact from promotions. They also reported a negative correlation between marginal impact and the number of promotions. Thus, McDonald and Rascher concluded that while having more promotions may be less effective, it may still be more profitable. They also concluded that the quality of promotion has an effect on attendance. Each dollar increase in the cost of the giveaway increased attendance by 2,688 fans.

Barilla, Gruben, and Levernier (2008) attempted to first determine which factors affect attendance at MLB games and, second, to determine the strength of those effects. They collected data from each of the 2,431 regular-season games played during the 2005 MLB season. The study's dependent variable was attendance. The model included four categories of independent variables: (a) variables describing characteristics of the home and visiting teams; (b) variables describing the characteristics of the game, including weather conditions, day of the week, and time of the game; (c) variables describing the ethnic background of the home team's announced starting pitcher; and (d) variables describing the type of promotion at the game.

Barilla, Gruben, and Levernier (2008) first revealed that teams with higher opening day payrolls have higher attendance, attracting an extra 610 fans for every $10 million increase in a team's payroll. They also found that, contrary to Boyd and Krehbiel (2003), promotions at games against rivals did not affect attendance differently than promotions at games against non-rivals. Second, they found that promotional timing is crucial. The results showed that weekday promotions generate much larger increases in attendance than weekend promotions. In addition, interleague games attract up to 700 more fans than intraleague games. Third, the results of this study did not support the findings of Scully (1974) and Krautman (1999), who found that attendance is less likely to increase when the home team's starting pitcher is not White (Barilla, Gruben, & Levernier, 2008). Finally, the results, coinciding with those of Boyd and Krehbiel, showed that certain types of promotions generate larger increases in attendance than others. Barilla, Gruben, and Levernier found that games in which a bobblehead was given away attracted 5,222 more fans than games that did not have a promotion, followed by 2,600 additional fans for textile product giveaways and 2,470 additional fans for memorabilia giveaways.

The hypothesis that certain types of promotions are more effective than others was supported by all three studies. Barilla, Gruben, and Levernier (2008) used 10 promotion variables, some of which were significant and some of which were not. Boyd and Krehbiel (2003) used three broad promotion variables. Marketers today are creative in their promotions, and it is likely that promotions could be grouped using more than just three categories. Ultimately, marketing managers need to understand which promotions have the largest impact on attendance and when those promotions will be most effective. I developed a model to determine the effects of promotions on attendance at Milwaukee Brewers games during the 2008 season.

Discussion

The dependent variable in the model was *attend*. The independent variables in the model were *hmwinpct*, *opwinpct*, *wkegame*, *mqegame*, *bobpromo*, *givpromo*, *coupromo*, and *evtpromo*. While I expected all of the independent variables to have a positive effect on attendance, some of them proved to be insignificant when tested with the other independent variables.

The *attend* variable indicated the number of fans who attended a Brewers game on a particular day. The seating capacity at Milwaukee's Miller Park is 41,900 ("Facts, Figures," 2009). The Brewers attracted more than 41,900 fans 32 times during the 2008 season because of standing-room-only admission.

The *hmwinpct* variable measured the effect of the Brewers' winning percentage on attendance. This variable was expected to have a positive effect on attendance because better teams tend to draw larger crowds.

The *opwinpct* variable measured the effect of the visiting team's winning percentage on attendance. This variable was expected to have a positive effect on attendance because fans are likely to attend Brewers games when they are playing against a strong opponent. Fans of the opposing team may also be more likely to attend their team's road games when they have a high winning percentage.

The *wkegame* variable measured the effect of a weekday game on attendance versus the effect of a weekend game on attendance. Games played Monday through Thursday are considered weekday games while games played Friday through Sunday are considered weekend games. The Brewers had 39 weekend games during the 2008 season ("2008 Brewers," 2008). Past studies (Boyd & Krehbiel, 2003) showed promotions are more effective for weekday games because weekend games generally draw larger crowds on their own.

The *mqegame* variable measured the effect of a marquee game on attendance versus the effect of a nonmarquee game on attendance. Marquee Brewers games have slightly higher ticket prices and normally occur when the team's closest rivals come to town. In 2008, the Brewers had 11 marquee games ("2008 Brewers," 2008).

The different promotion variables measured the effect of a promotion on attendance. At least one type of promotion was offered at 58 of the Brewers' 81 home games in 2008 ("2008 Brewers," 2008). Promotions were broken down into four categories of dummy variables. A dummy variable is a variable that encodes a particular attribute. It takes on the value of 0 or 1. The *bobpromo* variable measured the effect of a bobblehead promotion on attendance. The variable was given a value of 0 if there was no bobblehead promotion and a value of 1 if there was a bobblehead promotion. Bobblehead giveaways are generally a fan favorite and are considered one of the most effective forms of promotion, which justifies giving the bobblehead promotion its own category. The *givpromo* variable measured the effect of a giveaway promotion on attendance. The variable was given a value of 0 if there was no giveaway promotion and a value of 1 if there was a giveaway promotion. The Brewers' 2008 giveaways included caps, baseball cards, comic books, posters, t-shirts, bags, key chains, state quarters, car flags, and window clings ("2008 Brewers," 2008). The *coupromo* variable measured the effect of a coupon promotion on attendance. The variable was given a value of 0 if there was no coupon promotion and a value of 1 if there was a coupon promotion. The Brewers' 2008 coupon promotions included

coupons for the Harley Davidson Museum®, Quench Gum®, the Sports Authority®, and Valvoline Instant Oil Change® ("2008 Brewers," 2008). The *evtpromo* variable measured the effect of an event promotion on attendance. The variable was given a value of 0 if there was no event promotion and a value of 1 if there was an event promotion. The Brewers' 2008 events included doubleheaders with college baseball teams, pregame parades around the warning track, and a 5K run/walk ("2008 Brewers," 2008). All of the promotion variables were expected to have a positive effect on attendance; however, some were likely to be more significant than others.

I also collected data for whether or not the game was a night game, whether or not there was a promotion, and whether or not a ticket discount was offered. However, these variables were insignificant and were not included in the model.

I collected data for each of the Milwaukee Brewers' 81 home games during the 2008 regular season. All data were collected from the Milwaukee Brewers' official Web site, which provides box scores for all Brewers games ("2008 Brewers," 2008). Table 1 displays the description and summary statistics for the dependent variable.

Table 1
Dependent Variable Descriptions

Variable	Description	Min and max	Mean and standard deviation
attend	The number of people at a game	Min: 23,478 Max: 45,346	Mean: 37,884 Standard deviation: 6,567

The description, predicted sign, and summary statistics for each independent variable are displayed in Table 2. In addition, Table 2 displays means and standard deviations for each of the continuous variables and frequencies for dummy variables.

Table 2
Independent Variable Descriptions

Variable	Description	Predicted sign	Summary statistics
hmwinpct	The winning percentage of the home team	+	Mean: 0.564 Standard deviation: 0.071
opwinpct	The winning percentage of the visiting team	+	Mean: 0.494 Standard deviation: 0.085
wkdgame	Whether or not the game was played on a weekend	+	48.1% of games were played on a weekend
mqegame	Whether or not the game was a marquee game	+	13.6% of games were marquee games
bobpromo	Whether or not there was a bobblehead promotion	+	7.4% of games had a bobblehead promotion
givpromo	Whether or not there was a giveaway promotion	+	27.2% of games had a giveaway promotion
coupromo	Whether or not there was a coupon promotion	+	24.7% of games had a coupon promotion
entpromo	Whether or not there was an event promotion	+	29.6% of games had an event promotion

I expected my economic model to explain which promotions have the greatest effect on attendance. My model is as follows: $attend = \alpha + \beta_1 hmwinpct + \beta_2 opwinpct + \beta_3 wkegame + \beta_4 mqegame + \beta_5 bobpromo + \beta_6 givpromo + \beta_7 coupromo + \beta_8 evtpromo + \varepsilon$.

Regression Results

Table 3 displays the estimated coefficients, standard errors, and *p*-values for the constant and for each independent variable. The estimated coefficient describes the effect of an independent variable on the dependent variable given a unit change. The standard error is the standard deviation between the estimated and true values. Finally, the *p*-value describes the probability of rejecting the null hypothesis and being incorrect. Statistics are given for three equations. The third column reports the statistics when the dependent variable is *attend*. The fourth column reports the statistics when the dependent variable is log(*attend*). The dependent variable was logged so that results could be interpreted as percentages. The fifth column reports the statistics after the

first equation has been adjusted for heteroskedasticity, which occurs when the variance in the error terms is related to the explanatory variables. This causes the estimated standard errors to be biased.

Table 3
Regression Results

Variable	Stat	Dep. variable *attend*	Dep. variable log(*attend*)	Adjusted for HET
constant	β	46,959.0	10.836	46,959.0
	SE	6,338.0	0.185	5,096.0
	p-value	0.000	0.000	0.000
hmwinpct	β	-13,145.0	-0.415	-13,145.0
	SE	7,557.0	0.221	5,821.0
	p-value	0.086	0.065	0.027
opwinpct	β	-13,650.0	-0.446	-13,650.0
	SE	6,817.0	0.199	6,374.0
	p-value	0.049	0.028	0.036
mqegame	β	6,160.7	0.167	6,160.7
	SE	1,571.0	0.046	1,621.0
	p-value	0.000	0.001	0.000
wkegame	β	4,684.3	0.133	4,684.3
	SE	1,301.0	0.038	1,168.0
	p-value	0.001	0.001	0.000
bobpromo	β	5,562.3	0.146	5,562.3
	SE	2,167.0	0.063	1,127.0
	p-value	0.012	0.024	0.000
givpromo	β	4,459.9	0.126	4,459.9
	SE	1,319.0	0.039	1,034.0
	p-value	0.001	0.002	0.000
coupromo	β	637.0	0.022	637.0
	SE	1,291.0	0.038	1,390.0
	p-value	0.623	0.554	0.648
evtpromo	β	732.7	0.023	732.7
	SE	1,283.0	0.038	955.8
	p-value	0.570	0.544	0.446

The adjusted R^2 measures the percent of the variation in the dependent variable that is explained by variations in the independent variables. When the dependent variable is *attend*, the adjusted R^2 is .533. The adjusted R^2 when the dependent variable is log(*attend*) is .513. When the dependent variable is *attend* and after the equation has been adjusted for heteroskedasticity, the adjusted R^2 is .533.

The *hmwinpct* and *opwinpct* variables do not have the expected sign. All other factors held constant, a 10% increase in the home team's winning percentage will attract 1,315 (4.2%) fewer fans, and a 10% increase in the visiting team's winning percentage will attract 1,365 (4.5%) fewer fans. These coefficients can be explained by small differences in winning percentage throughout the season. The first few games of

the season are generally well attended. Games after the first week or two tend to draw fewer fans. The average attendance for the first three Brewers home games of 2008 was 39,933 fans. The next three games had an average attendance of 28,017 fans.

The results show that marquee games and weekend games both have a positive effect on attendance. All other factors held constant, a marquee game will attract 6,160.7 (16.7%) more fans and a weekend game will attract 4,684.3 (13.3%) more fans.

Each of the four promotion variables has a positive effect on attendance. All other factors held constant, a bobblehead promotion will attract 5,562.3 (14.6%) more fans and a giveaway promotion (posters, t-shirts, etc.) will attract 4,459.9 (12.6%) more fans. All other factors being equal, a coupon promotion (coupons for the Sports Authority®, the Harley Davidson Museum®, etc.) will attract 637.0 (2.2%) more fans and an event promotion (doubleheaders with college baseball teams, pregame parades around the warning track, etc.) will attract 732.7 (2.3%) more fans.

I used the Park test to determine if the regression specification had a problem with heteroskedasticity. A *p*-value of .04 reveals that the standard errors are not normally distributed and that the regression has problems with heteroskedasticity. The fifth column in Table 3 displays the statistics for the regression after it has been adjusted for hereroskedasticity. The estimated coefficients do not change. However, most of the standard errors are smaller and the *t*-ratios and *p*-values are slightly improved. These findings provide valuable insight and can be used to make recommendations to MLB marketing managers.

Conclusion and Recommendations

What are the effects of promotions on attendance at Milwaukee Brewers games? The results of this study show that promotions have a positive effect on attendance, confirming the findings of Barilla, Gruben, and Levernier (2008), Boyd and Krehbiel (2003), and McDonald and Rascher (2003). The findings reveal that certain promotions are more effective than others. Bobblehead promotions are the most effective, followed by giveaways, events, and coupons. Although all promotion variables positively affect attendance, a marquee opponent can attract more fans than a promotion.

These conclusions, however, are subject to limitations. First, data from more than one season should be analyzed. The data only included six bobblehead promotions and 22 giveaway promotions. This is not a large enough dataset to draw a conclusion. A larger sample size would likely help to better explain the effects of winning percentage on attendance. Second, it is unclear to what extent the results can be translated to other MLB teams. Other variables should be examined when comparing attendance across teams. Such variables might relate to demographics of the home team's city, weather, and holiday weekends.

The results from this study can be used to assist marketing managers with their promotional strategies. The findings show that those responsible for planning and scheduling promotions have a powerful tool at their disposal. As with any marketing situation, a perfect strategy to increasing attendance does not exist. Reaching 100% of the target audience and completely understanding consumer behavior is unrealistic. MLB marketing managers should use the results from this study along with their own

expertise to develop effective promotional strategies. In addition, marketing managers must determine when promotions are most effective, the order in which promotions are most effective, and the overall number of promotions that is most effective.

While conducting studies of past promotions will help the Brewers, one event proved to be the best marketing tool of all: getting to the playoffs. In 2008, the Brewers reached the postseason for the first time since 1982. Consequently, the Brewers saw a 20% jump in season-ticket sales during this past offseason and, as of May 12, 2009, were one of only three teams to see an increase in attendance (Nightengale, 2009). As long as the Brewers keep winning and giving away bobbleheads, the fans will keep coming.

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