The Effect Of Promotions On Attendance At Major League Baseball Games

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ABSTRACT

The determinants of attendance at professional sporting events come from a variety of team-specific, game-specific, and stadium-specific factors. Using data from the 2,431 major league baseball games played during the 2005 season, this study employs a multivariate regression model to determine the effect that the previously mentioned factors have on game attendance. The focus of the study is on the effect that promotions, such as product giveaways, have on attendance. The findings of this study indicate that having a promotion at a game increases attendance by about 1,532 fans. The findings also indicate that both the timing of a promotion and the type of promotion is important. Specifically, promotions held on weekends have a much smaller impact on attendance than promotions held during the week, with promotions held on Friday or Sunday having a particularly small effect. In terms of the type of promotion, this study finds that bobblehead giveaways have by far the largest impact on attendance and that several types of giveaways actually have no effect on attendance.

1. INTRODUCTION

The ultimate baseball-related objective of a major league baseball (MLB) team is to advance to the post-season playoffs and win the World Series, but it also has the financial objective of earning an economic profit for its owners. A major league team has several potential revenue sources, such as advertising within the stadium, concession leasing, sponsorships (i.e. naming the stadium), radio and television contracts, and product licensing. The largest source of revenue for most teams, however, is revenue derived from home game attendance. Game attendees purchase tickets for admission into the stadium, but they frequently spend additional money to park their cars in a team-owned parking lot, buy food in concession stands, and purchase souvenirs from vendors inside the stadium. As a result, teams that are more successful at garnering attendance are more likely to earn a larger profit than teams that are less successful at attracting fans to their games.

Major league baseball is different than other professional sports, like football, basketball, hockey, and automobile racing, in two important aspects: event status and seasonality. Because baseball teams play a large number of home games (81), fans are less likely to consider each game an event than a NASCAR race or National Football League (NFL) game. Communities that host NASCAR races typically host only one or two race *weekends* per year. A city that is home to an NFL football team hosts only eight regular-season games per year. NASCAR's or NFL's event status is expected to positively affect attendance at each function. Football fans tend to spend many hours at the stadium tailgating before and after the game. NASCAR is an even larger event because it is a multi-day function where fans set-up campsites at the track and attend qualifying rounds and practices. In addition, the Sunday *Nextel Cup* race is typically preceded by a *Busch Series* race on Saturday and a *Craftsman Truck Series* race on Friday evening.

Seasonality is also assumed to have a stifling effect on MLB attendance. Baseball's season, which begins in early April and ends in early October, is longer than most sports and occurs during both warm weather and cool weather months. Because much of the baseball season occurs during the warm weather months, this creates a situation in which many substitute activities compete for fans' attention. Although National Hockey League (NHL)

and National Basketball Association (NBA) teams also play a relatively large number of home games (approximately 40) during their seasons, much of their seasons occur in the late fall and winter when the weather is not as conducive to outdoor activities. As a result, the availability of substitute activities is expected to have a larger depressing effect on attendance at baseball games than at basketball and hockey games.

To overcome the diminishing effect of non-event status and seasonality, many MLB teams use promotions and promotional products as marketing tools to attract a consistent stream of fans to home games throughout the season. These tools involve offering incentives to attend a game. Examples include entertaining the fans with firework shows and concerts or providing product giveaways, where fans attending the game receive items such as baseball cards, bobbleheads, caps, shirts, or magnetic calendars. Using promotions to attract attendees originated many years ago. One of the most imaginative promoters in the history of baseball was the late Bill Veeck who, at various times, owned three different major league teams: the St. Louis Browns, the Cleveland Indians, and the Chicago White Sox. In the early 1940s he owned a minor league team, the now defunct Milwaukee Brewers that played in the old American Association. Veeck, a true “marketing genius,” did almost anything “to get fans in the seats” (Brewster, 2004). As an owner/promoter, Veeck drew 2.6 million fans to Cleveland Indians games in 1948, the most in the major leagues that year. The New York Yankees were the only other team to draw at least 2 million fans in 1948 (Baseball-reference.com). As an owner/promoter, “he gave away live pigs, beer, cases of food; he put on fireworks displays, staged weddings at home plate, and played morning games for wartime swing shift workers” (BaseballLibrary.com).

Although baseball’s promotional practices have existed for many years and have presumably made a difference on attendance, few studies have heretofore focused on the effect of promotions on attendance. This paper will fulfill this void through its two-fold purpose: 1) To determine which factors affect attendance at major league baseball games; and 2) To determine the strength of the effects. While many factors are likely to affect game attendance, the primary focus of this study is to determine the effect that game-day promotions have on attendance. The two issues are examined using a dataset containing information from the 2,431 regular-season games played during the 2005 MLB season. Because many factors beyond promotions impact attendance, qualitative and quantitative variables are used to measure a wide variety of factors.

The remainder of the paper is organized as follows. In the next section the economic and marketing literature related to explaining attendance at major league baseball games and at other professional sporting events is discussed. In Section 3 the data and the development of the multivariate regression models is explained. In Section 4 reports and discusses the regression results. Section 5 provides the promotion implications of the regressions and makes suggestions for marketing managers and other officials involved in planning and scheduling promotions. In the final section the findings are summarized and concluding remarks are offered.

2. THE LITERATURE REVIEW

Three approaches have been used in previous literature to estimate the effect that various factors have on attendance at professional sports activities. Some researches used attendance at individual games as the unit of observation (Boyd and Krehbiel, 2003; Bruggink and Eaton, 1996; Burdekin and Idson, 1991; Butler, 2002; McDonald and Rascher, 2000; Paul, 2003; and Price and Sen, 2003); others used average attendance per game for a season over several seasons or over several teams as the unit of observation (Coffin, 1996; Demmert, 1973; Kahane and Shmanske, 1997; Leadley and Zygmunt, 2005; Noll, 1974; Pan, et. al., 1999; Rivers and DeSchrive, 2002; Schmidt and Berri, 2001 and 2002; Winfree, et. al., 2004; and Zygmunt and Leadley, 2005); and, some used total league attendance over many years as the unit of observation (Schmidt and Berri, 2002).

Whitney (1988) asserted that baseball fans tend to view individual games in isolation from other games during the season. If this assertion is correct, then each individual game can be viewed as distinct from other games played by the same team. As such, each game can be legitimately treated as a separate observation.

Strikes and lockouts, such as the five strikes in 1972, 1980, 1981, 1985, and 1995-1995 and three lockouts in 1973, 1976, and 1990, are likely to affect attendance. Winfree, et. al. (2004) found that in the year of a strike

attendance is lower than it would have been in the absence of a strike. Coates and Harrison (2005) reported that the 1972 and 1981 strikes each resulted in a negative impact of 10 to 12 percent; whereas, the 1994-95 strike caused an approximate 24 percent attendance reduction. Their study further revealed that the work stoppages in 1973, 1976, 1980, 1985, and 1990 reduced attendance between three and seven percent. Coates and Harrison also found, similar to Schmidt and Berri (2002), the effect of strikes on attendance has historically disappeared in the season following the strike.

Another major determinant of attendance is a team's win-loss record. Those teams with winning records, especially those that win championships, are generally thought to attract more fans than teams with losing records. Scully (1974) and Medoff (1976) reported that winning percentage was positively related to attendance and a team's revenue. Numerous other studies (McDonald and Rascher, 2000; Pan, et. al., 1999; Quirk and El-Hodiri, 1974; Schmidt and Berri, 2001; Winfree, et. al., 2004; and Zygmunt and Leadley, 2005) have also found a positive relationship between attendance and the win percentage (or lagged win percentage) of MLB teams. Burdekin and Idson (1991) and Leadley and Zygmunt (2005) had a similar finding for NBA teams. Both Demmert (1973) and Noll (1974) reported a positive relationship between attendance and past championships and a negative relationship between attendance and games trailing the division leader. Whitney (1988) reported that winning and being a champion are not interchangeable. In other words, attendance depends more on competitive performance and perceived championship potential than on actually winning a championship.

Because of the potential increased sales tax revenues, the recent trend of cities is to lure teams into their areas by building new stadiums. Coates and Humphreys (2005) discovered that new baseball stadiums built between 1969 and 2001 generate an average of 2,500,794 in additional tickets sales over the first eight seasons. They refer to these increases in ticket sales as a novelty effect, which diminishes after eight years. Quirk and Fort (1997) also examined the novelty effect and discovered a 62 percent increase in attendance during the first five years of a new stadium's life. Zygmunt and Leadley (2005) and Leadley and Zygmunt (2005) also found that new stadiums or new arenas generate additional attendance at MLB and NBA games, respectively. The results of their studies indicated that the positive effect of a new stadium lasts about 15 years in MLB and the positive effect of a new arena lasts about eight years in the NBA. Rivers and DeShriver (2002) examined the attendance effect in MLB of a new stadium and one that is between two and five years old. The researchers determined that the effects in both situations are positive, with the first effect being much stronger than the second. McDonald and Rascher (2000) examined the effect of a stadium whose age is ten years or less and found a positive effect on attendance.

Explanatory variables in past studies have included stadium capacity and other stadium characteristics. Zygmunt and Leadley (2005) found that games played in multi-purpose stadiums had lower attendance than games played in baseball-only stadiums, *ceteris paribus*, and Rivers and DeShriver (2002) found that stadiums with artificial playing surfaces draw fewer attendees than ones with grass fields. In examining the effect of a stadium's capacity on attendance, Pan, et. al. (1999), found that the attendance/capacity ratio was negatively affected by a stadium's capacity, while Coates and Harrison (2005) and McDonald and Rascher (2000) found that a stadium's capacity had a statistically insignificant effect on attendance.

The effect of several game-specific factors, such as the weather, month, and day of the week have also been examined for their effect on attendance. Boyd and Krehbiel (2003), McDonald and Rascher (2000), and Rivers and DeShriver (2002) all found that attendance at major league baseball games is higher for weekend games than weekday games, and that attendance is higher for warm weather games than for cool weather games. McDonald and Rascher (2000) also found that attendance is higher for a team's opening day than for its other games, *ceteris paribus*. For the NHL, Paul (2003) found that attendance is higher for weekend games than weekday games. Additionally, he found that attendance is higher on opening night than for the remaining games, that it is higher for late season games than for mid-season games, and that it is lower for early season games than it is for mid-season games.

Some studies have found that variation in game-level attendance is based partially on competition type, intra- or inter-league and if the game is played with a designated hitter.¹ Evidence indicates that games involving two traditional rivals or two teams from the same division positively affect attendance at MLB or NHL games (Boyd

and Krehbiel, 2003; McDonald and Rascher, 2000; and Paul, 2003). Results of studies about which league attracts more fans for intra-league games are contradictory. Domazlicky and Kerr (1990) reported that the American League has better attendance than the National League because of the designated hitter rule. However, McDonald and Rascher (2000) found evidence that when other relevant factors are controlled, attendance at American League games is lower than attendance at National League games. After examining the situation by controlling the day of the week a game is played, Butler (2002) found that inter-league games during the 1999 season had a seven percent higher attendance than intra-league games. The increases were highly dependent on the opposing team.

Fan discrimination, or fan preferences for or against players of certain races or ethnic backgrounds, may also affect attendance. McDonald and Rascher (2000), Scully (1974), and Krautmann (1999) all found that the starting pitcher's race influenced attendance at MLB games. Similar results have been found in other sports related areas. Burdekin and Idson's 1991 study of NBA attendance during the 1980-81 through the 1985-86 seasons indicated that a team's racial composition affected its season attendance. In studies of the baseball card market, Nardinelli and Simon (1990) and Anderson and LaCroix (1991) both found evidence that the cards of non-white players sell for less than the cards of white players of comparable abilities.

Promotions at baseball games are also likely to affect attendance. McDonald and Rascher (2000) examined the effect of promotions on attendance at major league baseball games. They based their analysis on the home games of six teams during the 1999 season by using three categories of promotions, price discounts, giveaways, and special features. Their findings indicated that promotions have a positive impact on attendance, but the effectiveness varies by promotion category and by team. More specifically, weekend promotions are relatively ineffective compared to weekday promotions, and that promotions at games against rivals are relatively ineffective compared to games against non-rivals. The analysis was based their analysis on the home games of 19 teams during the 1996 season. To account for the type of promotion, a variable that measures the cost of the promotion was included as a proxy for the value of the promotion. They found that attendance at games having a promotion is higher than at games without a promotion and the increase is positively related to the value of the promotion.

3. THE DATA AND THE REGRESSION MODEL

The intent of this paper is to develop a model that estimates attendance at individual games, regardless of the particular roles that demand and supply components play in the determination of seasonal attendance. The factors that factors affect attendance at MLB games along with their relative strengths will be determined. The model developed in this section is not used for the purpose of estimating a demand equation for attendance, rather it focuses on the effect that game-day promotions have on attendance. The basic regression model is:

$$(1) \quad \text{Attend}_i = \alpha + \beta X_i + \varepsilon_i.$$

Attend_i is a vector measuring the number of persons attending the i^{th} game, X_i is an independent vector of variables for the i^{th} game hypothesized to affect game attendance, and ε_i is an error term for the i^{th} game. The α and β terms represent the intercept and slopes, respectively. The regression is estimated with ordinary least squares² using data from the 2,431 major league games played during the 2005 season.³

Table 1 defines all explanatory variables in the model. Four categories of independent variables are included in the model: 1) variables related to characteristics of the home and visiting teams; 2) categorical variables related to characteristics of the game, such as weather conditions, day of the week, and whether the game is played at night or during the day; 3) categorical variables related to the ethnic background of the home team's announced starting pitcher; and, 4) categorical variables related to the type of promotion, if any, at a particular game.⁴ Table 2 lists the promotion categories, which are based on the Promotional Products Association International (PPAI) classifications. Several smaller categories are combined into a single group to reduce the number of promotional variables to a manageable number.

Table 1
The Independent Variables and Their Definitions

Variables Related to Characteristics of the Home and Visiting Teams	
Capacity	the capacity attendance of the stadium where the game was played
HTPayroll	the opening day player payroll of the home team, in millions of dollars
HT04Attn	the 2004 average attendance of the home team
VTRdAttn	the 2005 average road attendance of the visiting team
Categorical Variables Related to Game Characteristics (weather, day, month, etc.)	
D_RainCld	equals 1 if the weather conditions at the game are rain, drizzle, cloudy, or overcast; 0 otherwise
D_Cold	equals 1 if the temperature at the game is below 55 degrees; 0 otherwise
D_InterLg	equals 1 if the game is an inter-league game; 0 otherwise
D_SmeDiv	equals 1 if the game involves two teams from the same division; 0 otherwise
D_Holiday	equals 1 if the game is played on Memorial Day, Independence Day, or Labor Day; 0 otherwise
D_SpecDay	equals 1 if the game was the first home game of the season, the last home game of the season, played on Mother's Day, played on Father's Day, part of a single-admission double header, or played on September 11; 0 otherwise
D_Saturday	equals 1 if the game is played on Saturday; 0 otherwise
D_FriSun	equals 1 if the game is played on a Friday or Sunday; 0 otherwise
D_PreMem	equals 1 if the game is played prior to Memorial Day; 0 otherwise
D_Summer	equals 1 if the game is played in between Memorial Day and Labor Day, inclusive; 0 otherwise
D_Day	equals 1 if the game is a day game; 0 otherwise
D_Dome	equals 1 if the game is played in a domed stadium; 0 otherwise
D_Outdoor	equals 1 if the game is played in an outdoor stadium that lacks the ability to close the roof; 0 otherwise
Categorical Variables Related to the Home Team Starting Pitcher's Race	
D_HTSPH	equals 1 if the home team's starting pitcher was born in Mexico, a Latin American nation, or a Caribbean nation; 0 otherwise
D_HTSPA	equals 1 if the home team's starting pitcher was born in an Asian nation; 0 otherwise.
D_HTSPNW	equals 1 if the home team's starting pitcher was born in the USA and is nonwhite; 0 otherwise
Categorical Variables Related to Promotions	
D_Promo	equals 1 if there was a promotion at the game; 0 otherwise
D_BobHead	equals 1 if there was a bobblehead promotion at the game; 0 otherwise
D_Autogrf	equals 1 if there was an autograph/photograph day promotion at the game; 0 otherwise
D_BBR	equals 1 if there was a buttons, badges, or ribbons promotion at the game; 0 otherwise
D_FigSta	equals 1 if there was a figurine or statue promotion at the game; 0 otherwise
D_Poster	equals 1 if there was a poster or photograph promotion at the game; 0 otherwise
D_Cards	equals 1 if there was a baseball card promotion at the game; 0 otherwise
D_Textile	equals 1 if there was a textile promotion at the game; 0 otherwise
D_Wearable	equals 1 if there was a wearables promotion at the game; 0 otherwise
D_SpGds	equals 1 if there was a sporting goods, leisure products, or travel accessories promotion at the game; 0 otherwise
D_Memorab	equals 1 if there was an authentic memorabilia promotion at the game; 0 otherwise
D_ProOthr	equals 1 if there was a promotion at the game not covered in one of the ten above categories; 0 otherwise

Table 2
Promotional Products Association International (PPAI) Categories

Authentic Memorabilia	Electronic Devices & Accessories
Autograph/Photo Day	Figurines and Statues
Automotive Accessories	Games/Toys/Playing Cards/Inflatables
Bags	Housewares/Tools
Baseball Card	Magnets
Bobbleheads	Personal/Pocket-Purse Products
Buttons/Badges/Ribbons	Photos/Posters
Calendars	Recognition Awards/Trophies/Jewelry
Clocks and Watches	Sporting Goods/Leisure Products/Travel Accessories
Coins and Medallions	Stickers, Decals, and Beanie Babies
Computer Products	Textiles
Desk/Office/Business Accessories	Wearables
Drinkware	Writing Instruments

Table 3 reports the average 2005 attendance at various types of baseball games. The results indicate that the average attendance varies by numerous game-related factors, such as day of the week, month, time of day (i.e. day or night), inter-league or intra-division game, etc. The standard deviations also differ, indicating that attendance is less consistent for some types of games than for others.

Table 3
Average Attendance at Major League Baseball Games by Selected Categories – 2005

	Mean	N	Std. Deviation
Day of Week			
Monday	29256.7	250	11445.5
Tuesday	27984.2	363	10335.7
Wednesday	28278.5	372	10148.2
Thursday	28396.9	279	10677.4
Friday	32415.5	385	10454.8
Saturday	35576.4	390	9409.6
Sunday	33084.7	392	10047.6
Month			
April	29827.7	350	11935.0
May	29360.1	415	10801.3
June	31778.9	399	10077.3
July	32834.7	406	10385.6
August	32544.3	418	9652.8
September	28949.9	413	10619.9
October	34803.8	30	9507.8
Day vs. Night Game			
Day Game	32205.4	904	10940.6
Night Game	30206.3	1527	10431.9
Inter-league Game			
IL Game	32922.7	249	10675.6
Not IL Game	30724.6	2182	10643.6
Division Status of Teams			
Same Division	30208.4	1095	10882.6
Different Divisions	31557.3	1336	10449.2
Holiday Status			
Holiday Game	34769.6	36	10232.4
Non-Holiday Game	30892.3	2395	10663.6
Promotional Status			
Promotional Give-away	34137.4	713	10189.6
No Promotion	29629.8	1718	10581.4
Special Day Status			
First Home Game	45241.3	30	6551.0
Mother's Day	30214.7	16	11425.6
Father's Day	34190.0	15	9710.2
Independence Day	39227.6	15	9916.1
September 11	29959.5	15	12192.5
Last Home Game	33052.9	30	11260.9
Single Admission Double Header	26794.2	24	9404.8
TOTAL	30949.7	2431	10665.6

Not surprisingly, the average attendance at weekend games is larger than weekday games. The average is highest for Saturday games and lowest for Tuesday games. The average for Saturday games is approximately 27 percent higher than the average for a Tuesday game; however, the standard deviation is higher for Tuesday games,

indicating attendance at Tuesday games is less consistent than at Saturday games. The second and third largest crowds are for Friday and Sunday games, respectively.

The month during which the game is played also affects attendance. Excluding October, since each MLB team only played two games in October, the study revealed that July and August games have the highest average attendance, while games played in September have the lowest average attendance. One likely reason for the relatively low September attendance is that many teams have been eliminated from being post-season playoff participants, resulting in lessened interest from non-playoff team's fans. August games have the smallest standard deviation, indicating more consistency in attendance for this month than any other in the season. April games, on the other hand, have the largest standard deviation, indicating that attendance in the first month of the season has a greater variance than latter months. Likely reasons for the relatively high standard deviation in April include Spring Break vacations, rainy weather, and inconsistent weather conditions, especially in the northern cities.

Some of the other factors leading to variability in average attendance include: day vs. night, intra-league vs. inter league, promotions vs. no promotions, and average day vs. holiday. Day games outdrew night games, on average, by approximately 2,000 fans. Inter-league games outdrew intra-league games, on average, by about 2,200 fans. Intra-divisional games, somewhat surprisingly, actually drew fewer fans, on average, than games between teams from different divisions. Games played on the three national holidays occurring during the season (Labor Day, Independence Day, and Memorial Day), drew an average of 4,800 more fans than non-holiday games. Games at which promotions were offered drew about 4,500 more fans than games at which no promotions were offered. The category with the largest average attendance was the first home game, which was nearly 15,000 (almost 50%) more than for a typical game.

4. THE REGRESSION RESULTS

Four versions of the equation were run to determine the effect of various factors on game attendance and to determine if the effect of promotions varies with the timing of the promotion. Model 1, the baseline regression, includes only the non-promotion variables that are hypothesized to affect attendance. To examine the effect of promotions on attendance, Model 2 expands Model 1 by including a game-day promotional dummy variable. Model 3 includes interaction terms that help determine if the effect of promotions on attendance is stronger at certain times than others. Since certain promotions are likely to have a larger effect on attendance than others, Model 4 includes separate dummy variables that indicate the particular type of game-day promotion (e.g., bobblehead promotion, baseball card promotion, photo/poster promotion, etc.). The results of this regression indicate the effect that specific types of promotions have on game attendance.

Table 4
The Regression Results of the Attendance Model

Variable	Model 1	Model 2	Model 3	Model 4
Capacity	.162 ^a (6.925)	.159 ^a (6.829)	.160 ^a (6.858)	.161 ^a (6.852)
HTPayroll	61.519 ^a (10.311)	60.720 ^a (10.227)	60.542 ^a (10.213)	61.962 ^a (10.432)
HT04Attn	.670 ^a (25.250)	.663 ^a (25.091)	.659 ^a (24.973)	.661 ^a (24.830)
VTRdAttn	.796 ^a (18.374)	.807 ^a (18.707)	.813 ^a (18.840)	.806 ^a (18.722)
D_RainCld	-.685.308 ^b (2.184)	-.683.322 ^b (2.189)	-.674.207 ^b (2.161)	-.691.873 ^b (2.222)
D_Cold	-1127.676 ^b (1.668)	-1012.820 ^c (1.505)	-1034.967 ^c (1.540)	-1097.477 ^c (1.633)
D_InterLg	585.834 ^c (1.311)	622.890 ^c (1.401)	685.089 ^c (1.318)	695.540 ^c (1.569)
D_SameDiv	36.705 (.131)	29.027 (.104)	-32.910 (.102)	85.620 (.307)
D_Holiday	5111.593 ^a (4.753)	4968.918 ^a (4.643)	4757.873 ^a (4.446)	4998.761 ^a (4.679)

D_SpecDay	4288.761 ^a (7.212)	4103.844 ^a (6.924)	3894.274 ^a (6.542)	4223.508 ^a (7.113)
D_Saturday	7181.289 ^a (18.921)	6758.578 ^a (17.490)	7005.488 ^a (14.487)	6749.583 ^a (17.432)
D_FriSun	4010.057 ^a (13.239)	3635.958 ^a (11.729)	4320.304 ^a (11.849)	3637.707 ^a (11.723)
D_PreMem	489.442 (1.164)	271.292 (.645)	261.078 (.622)	273.642 (.651)
D_Summer	2965.132 ^a (7.537)	2840.530 ^a (7.245)	2842.375 ^a (7.252)	2821.139 ^a (7.202)
D_Day	-29.481 (.103)	-117.321 (.408)	-177.363 (.514)	-101.376 (.353)
D_Dome	-351.601 (.551)	-473.979 (.747)	-489.680 (.772)	-584.999 (.909)
D_Outdoor	1861.455 ^a (5.259)	1882.776 ^a (5.346)	1844.825 ^a (5.242)	1889.897 ^a (5.374)
D_HTSPH	656.642 ^b (2.069)	688.210 ^b (2.178)	665.724 ^b (2.110)	695.770 ^b (2.211)
D_HTSPA	-1154.366 ^c (1.587)	-1102.350 ^c (1.524)	-1071.971 ^c (1.484)	-1079.573 ^c (1.496)
D_HTSPNW	-380.099 (.481)	-634.952 (.679)	-486.468 (.619)	-431.265 (.549)
Promotion Variables				
D_Promo		1532.444 ^a (5.136)	2630.514 ^a (4.496)	
D_BobHead				5522.304 ^a (6.038)
D_Autogrff				-1632.399 (1.269)
D_BBR				626.952 (.479)
D_FigSta				1139.337 (1.071)
D_Poster				1443.814 ^b (1.654)
D_Cards				-998.241 (1.076)
D_Textile				2598.941 ^a (2.887)
D_Wearable				1181.178 ^b (2.057)
D_SpGds				771.167 (.869)
D_Memorab				2471.170 ^b (2.301)
D_ProOthr				1394.917 ^a (3.039)
Interaction Terms				
Int_Promo*Div			136.380 (.243)	
Int_Promo*Sat			-1518.590 ^b (1.834)	
Int_Promo*FriSun			-2522.749 ^a (3.629)	
Int_Promo*Day			490.867 (.820)	
N	2431	2431	2431	2431
R-Square	.659	.663	.665	.668
F-value	232.964	225.46 ^a	190.683 ^a	155.46 ^a

Notes:

The regressions are run with a constant term, the results of which are not reported here.

The absolute values of the t-statistics are in parentheses.

a, b, and c denote statistically significant at the .01, .05, and .10 levels, respectively.

All hypothesis tests are run using a one-tailed test.

Table 4 shows that most of the variables included in the regressions have the expected effect on attendance and are statistically significant. All of the variables related to the characteristics of the home and visiting team have a positive effect (at the .01 level of significance).⁵ The regression results further indicate that teams with larger stadiums draw larger crowds, although attendance does not increase one-for-one with an increase in capacity. The results suggest that increasing stadium capacity by 1,000 seats at a stadium raises home game attendance by approximately 160 people. The analysis also reveals that teams with larger opening day player payrolls have higher attendance. An increase in a team's player payroll of \$10 million enhances the team's average attendance of approximately 610 fans. Because teams play 81 home games per year, this suggests that a \$10 million investment in a team's player payroll is expected to increase its total season attendance by about 49,400 fans. A team's payroll is often perceived by fans to be an indicator of the ownership's commitment to building a team that can effectively compete for championships. This study's findings suggest that teams that are willing to invest in building a winning team are rewarded through fan attendance, which can significantly increase the team's revenue and brand equity.

The results further indicate that a team's previous season's attendance is a strong determinant of attendance for the following year. Teams that drew a large number of fans in 2004 also tended to draw a large number of fans in 2005. As with capacity, the difference is less than a one-for-one relationship. The analysis indicates that an increase of 1,000 fans in the 2004 average home attendance induced an increase of approximately 660 fans at the 2005 home games. This suggests that a lag effect exists in a team's popularity. As a result, team management must be cognizant of season-to-season trends in average home attendance. This study implies that if a team has difficulty attracting fans to its games in a particular season, the problem is likely to extend to the next season as well. Finally, the visiting team's average road attendance also affects attendance at MLB games. If average road attendance is a measure of a team's fan popularity in cities other than its home town, then this result supports the idea that a visiting team with a broader fan base draws larger crowds than less popular ones. Unfortunately, the game scheduling is performed by the Office of the Commissioner of Major League Baseball rather than by the individual team's management. In other words, teams lack the ability to create a schedule that will maximize attendance at their games. The current scheduling practice utilizes an unbalanced schedule, where teams play a disproportionately large number of games against teams in their own division rather than against teams in other divisions. If a team happens to be in the same division as relatively unpopular teams, then the team is likely to have relatively low average attendance. This suggests that current scheduling practices may limit certain teams' attendance.

The game characteristic variables examined in this study generally indicate a statistically significant effect on game attendance; however, a few are statistically insignificant. For example, the weather conditions in which a game is played affect game attendance. Games played in rainy, cold, or cloudy conditions have lower attendance than games played in more pleasant conditions --- approximately 680 fewer fans. This study also revealed that attendance is 600 to 700 higher for inter-league games than for intra-league games (but only at the .10 level of significance). This effect is much smaller than was suggested in Table 3, which indicates that the average attendance at inter-league games is 2,198 higher than at intra-league games. One possible reason for the lower than expected effect is that a large number of inter-league games are played on the weekends, all of which are played between late May and late June. As such, they are played at times when attendance is relatively high, regardless of the opponent. The inter-league game attendance effect is relatively weak when controlling for the day of the week and the month. Intra-divisional games were anticipated to have a strong, positive effect on attendance for two reasons. First, most rivalries in the major leagues are between teams in the same division. In addition, since the competition for spots in the post-season playoffs is ultimately between teams in the same division, intra-divisional games should generate more interest because of their relative importance. Somewhat unexpectedly, games between teams from the same division do not have a significantly different effect on attendance than intra-league, inter-division games.

Major league teams play games in three types of stadiums: domed stadiums (the Tampa Bay Devil Rays and Minneapolis Twins); stadiums with a retractable roof or dome that can be opened or closed at the discretion of the home team (the Arizona Diamondbacks, Milwaukee Brewers, Seattle Mariners, Houston Astros, and Toronto Blue Jays); and outdoor stadiums. Each stadium type affects attendance. Since the retractable roof stadium group is the omitted category, the D_Dome and D_Outdoor variables indicate the effect of domed stadiums and outdoor stadiums, respectively, on attendance relative to retractable roof stadiums. The regression results indicate that

games played in outdoor stadiums attract almost 1,900 more fans than games played in retractable roof stadiums. No significant difference exists between domed stadium game attendance compared to games played in retractable roof stadiums.

Factors related to when the game is played, such as day or night, weekday or weekend, and the time of year also are found to affect attendance. The regression results indicate that games played on one of the three national holidays occurring during the baseball season (Memorial Day, Independence Day, and Labor Day) draw approximately 5,000 more fans than other games days. The results also indicate that games played on a special day, such as each team's first home game, each team's last home game, Father's Day, Mother's Day, single-admission double headers, and September 11, draw about 4,200 more fans than games played on typical days. The results further reveal that Saturday game attendance is approximately 6,800 to 7,000 higher than at weekday games. Friday and Saturday games attract between 3,600 and 4,300 more fans than weekday games. The ones played between Memorial Day and Labor Day draw about 2,800 more fans than games played after Labor Day. Attendance at games played prior to Memorial Day is not significantly different than attendance at games played after Labor Day.

Scully (1974) and Krautman (1999) both asserted that fans discriminate by attending games in smaller numbers when the home team's starting pitcher is not white. This study's results do not support that hypothesis. Fan discrimination was tested by classifying games according to home team's announced starting pitcher for each game into one of four ethnic groupings: 1) born in a Latin American or Caribbean nation; 2) born in an Asian nation; 3) born in the USA and non-white; and, 4) born in the USA and white, the category omitted for comparison purposes. The results suggest that games in which a Hispanic pitcher is the home team's starting pitcher draws nearly 700 more fans than games in which the starting pitcher is a USA-born white, while an Asian home team starting pitcher draws about 1,100 less fans. Finally, the results reveal no statistically significant difference between the home team starting a US-born white pitcher and a US-born non-white pitcher.

5. PROMOTION IMPLICATIONS

This study's results have deeper implications than what may appear at first glance. Although MLB teams' ultimate financial objectives are to earn economic profits for their owners, a team's management has little control of many of key factors that affect attendance. Because attendance and brand equity are major revenue drivers, understanding the factors that impact attendance, their depth, and measures management can take to improve attendance is *essential*. For example, the fact that attendance levels from one year impact the following year places greater importance in long-term planning in the marketing department. Marketing managers who recognize the most important promotional categories and *effectively* invest in promoting their teams gain a much longer-term benefit than they may realize.

The regression results provide strong evidence supporting the hypothesis that promotions increase attendance at major league baseball games. Model 2 in Table 4 indicates that attendance at games in which a promotion is offered is 1,532 higher than games where none is offered. Over the course of an entire season, the effect of promotions is likely to be substantial, since 713 of the 2,431 baseball games played in 2005 (29.5 percent of all games) involved a promotion. Because a major league baseball team plays 81 home games during a season, a typical team is expected to offer a promotion at approximately 24 games.⁶ If each of these 24 games draws an additional 1,532 fans, then the games with promotional product offerings should attract an additional 36,768 fans for a typical team's season. The additional revenue potential is phenomenal according to the Fan Cost Index.⁷ This indicator suggests that greater revenue generated by a typical team from the additional fans is approximately \$1.5 million.

The results of Model 3 further indicate that the timing of the promotion is important. The coefficient on D_Promo indicates that weekday promotions increase attendance by approximately 2,631 fans relative to weekday games without a promotion. The weekend games promotional product effect on attendance is much smaller. The coefficients on the interaction terms, Int_Promo*Sat and Int_Promo*FriSun, were used to determine the effect. The regression results indicate that attendance at a Saturday game with a promotion is approximately 1,112 more fans than it is at a Saturday game without a promotion. The results indicate that attendance is only about 108 more

fans for Friday and Sunday games than at same day games without promotions. These last two results suggest that major league teams are better served having promotions during the week than on the weekend.

A weekday promotion is expected to induce an increase in attendance that is about 2.4 times larger than on a Saturday and about 24 times larger than on a Friday or Sunday. This is a particularly important consideration for marketing managers. During the 2005 season, one MLB team ran a promotion on the team's 13 home game Sundays. The promotional was a collectible item that should have generated a frenzy from fans and motivated them to attend all 13 home games. According to this study, that specific team was ineffective in its promotional efforts since the promotions were placed on the least effective day of the week.

The study indicates that a promotion held at a game between intra-divisional teams is statistically insignificant. Thus, promotions held at games between rival teams do not have an attendance effect that's different than promotions held at games between non-rivals. This finding is contrary to Boyd and Krehbiel (2003), who found that promotions held at games between rivals were less effective than promotions held at games between non-rivals. Another promotional timing aspect of some importance is if the promotion is offered during a day game. According to this study, the promotion effectiveness of day games is no different than the effectiveness of promotions held at night games. These last two findings suggest that marketing managers do not need to be concerned with whether time of the game if it is between rivals or non-rivals.

One thing marketing managers must consider is the type of promotion to offer. The largest attendance impact accompanied a bobblehead promotion, which attracted 5,522 more fans than games without a promotion. Textile products and memorabilia promotions, the second and third most effective promotional types, increased attendance by about 2,600 and 2,470 fans, respectively. Promotions involving wearable products also significantly affected attendance, but not nearly as effective as the previous three. Wearables had less than half the impact of textile products and memorabilia. Other types of promotions had no impact on attendance. Specifically, autograph/photo days, promotions involving buttons, badges, or ribbons, promotions with figurines and statuettes, baseball card promotions, and promotions that give away sporting goods, leisure goods, and travel accessories all have a statistically insignificant effect on attendance. Teams that used these types of promotions may have reinforced brand equity, but probably did not increase it with those --- as a whole, they certainly did not increase revenue by offering the products in the latter categories. Therefore, teams must pay attention to the types of promotions they offer. By carefully analyzing the types of products and carefully planning promotions, a marketing manager can be much more effective by incorporating promotions with a larger impact on attendance into their marketing plans.

6. SUMMARY AND CONCLUDING REMARKS

This paper has examined the effect that various team-specific and game-specific characteristics have on attendance at major league baseball games. As the unit of observation, all 2,431 games played during the 2005 season used. The primary characteristics of interest were those related to promotions, in the form of product giveaways, autograph day, and so on. During the 2005 season, there were 713 games that involved a promotion, thus promotions occurred at nearly 30 percent of all games that were played during the season. Three specific promotion-related questions were examined in the paper: 1) Do promotions increase attendance at major league games?; 2) Does the timing of the promotion matter in its attendance impact?; and, 3) Do different types of promotions have different attendance impacts?

The findings of this study suggest that marketing managers and other team officials responsible for planning and scheduling promotions have a powerful tool that they can effectively use to increase attendance at their team's baseball games. The findings imply, however, that they need to be selective in the timing of the promotions and the types of promotions they offer. This study's results indicate that weekday promotions generate much larger increases in attendance than weekend promotions. Additionally, the results indicate that certain types of promotions attract additional fans to the stadium in large numbers, but other types of promotions fail to increase attendance above what would occur in the absence of a promotion. The largest positive impact on attendance came from bobblehead, textile product, and memorabilia promotions. Ones with a smaller, but still positive, impact on

attendance were poster/photograph promotions and promotions where wearable apparel is given away. The remaining classes of promotions did not significantly affect attendance at MLB games. Marketing managers who need to use promotions as a vehicle for increasing attendance at their games, as most do, should concentrate their efforts on only a few types of promotions and hold them on weekdays.

The results, implications, and concluding remarks are based on the assumption that all other factors are held equal for all teams. As with any marketing situation, a perfect solution to an advertising or promotional decision does not exist. The suggestions should be used along with the marketing manager's expertise and knowledge of his or her specific team.

ACKNOWLEDGEMENTS

The authors would like to thank David Hoaas, Rodney Paul, and two anonymous referees for their helpful comments and Yvonne Parkhurst for her diligence in collecting the data used in the paper. A special thank you goes to J.T. Marburger and Incentive Marketing for funding this study.

ENDNOTES

1. American League games and National League games have one major difference. In the National League all nine defensive players, including the pitcher, must take their turn to bat when their team bats. Most pitchers, with few exceptions, are notoriously poor hitters (i.e., batters). As such, the pitcher is often considered a nearly automatic out when he bats. Beginning in 1973, American League games have been played with a designated hitter who bats in place of the pitcher. The original intent of the designated hitter rule was to increase the offensive output of the batting team.
2. Ordinary least squares is used since the estimated model is intended to determine the effect that various factors have on single-game attendance, rather than determining the demand for major league baseball games. Had the study focused on estimating a demand equation, then a two stage least squares (2SLS) or other simultaneous equations model would have been utilized.
3. Twenty-four games were part of a single-admission double header. A single-admission double header is defined as two games played on the same day at the same location, where the second game is played shortly after the conclusion of the first game, and where a person can attend both games by purchasing one ticket for the price of a single game. Attendance is reported only for the second game. For the twelve games that were the first game of a single admission double header, attendance at the first game is assumed to be identical to attendance at the second game when determining the value of the dependent variable.
4. In 2005, promotional products were used at 713 of the 2,431 major league baseball games. Twenty-one of the games involved multiple promotions, while the remaining 692 games involved a single promotion. There were 48 bobblehead promotions, 24 autograph/photo day promotions, 23 buttons/badges/ribbons promotions, 35 figurines & statues promotions, 55 photo/poster promotions, 47 baseball card promotions, 49 textile promotions, 130 wearables promotions, 52 sporting goods/leisure products/travel accessories promotions, 35 memorabilia promotions, and 225 promotions involving other types of giveaways.
5. Each of the four variables related to characteristics of the home and visiting teams have a relatively large range. Capacity ranges from 57,546 (Yankee Stadium) to 35,095 (Fenway Park); the home team opening day player payroll ranges from \$208,306,817 (New York Yankees) to \$29,679,067 (Tampa Bay Devil Rays); the 2004 average home attendance ranges from 47,788 (New York Yankees) to 16,139 (Tampa Bay Devil Rays); and the 2005 average road attendance ranges from 37,735 (Boston Red Sox) to 25,906 (Kansas City Royals). Information on the stadium capacity for the 30 major league teams was obtained from the *Ballparks of Baseball: The Fields of Major League Baseball* website, (<http://www.ballparksofbaseball.com/capacity/htm>). The home team opening day payroll figures for the 30 teams were obtained from the *USA Today: Baseball Salaries Database* website, (<http://asp.usatoday.com/sports/baseball/salaries/default.aspx>). The 2004 average home attendance and 2005 average road attendance figures were obtained from the *ESPN: MLB Attendance Report* website, (<http://sports.espn.go.com/mlb/attendance>). Each of the above websites was accessed on June 16, 2006.

6. The number of games at which a promotion was offered varied greatly by team, ranging from 0 (the Boston Red Sox) to 46 (the Chicago Cubs). There were two teams that had less than ten games at which a promotion was offered, 11 teams that had between 10 and 19 games at which a promotion was offered, nine teams that had between 20 and 29 games at which a promotion was offered, five teams that had between 30 and 39 games at which a promotion was offered, and three teams that had 40 or more games at which a promotion was offered.
7. The Fan Cost Index™, published annually by Team Marketing Report, Inc., computes the cost of a family of four attending a ballgame. The cost is computed individually for each team for each season. The average cost for a family of four to attend a game in 2005 was \$164.36. The Fan Cost Index™ is available at <http://www.teammarketing.com/fci.cfm> and was accessed on June 16, 2006.

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