

The Effect of Adding the Wild Card in Major League Baseball – An Attendance Analysis

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Abstract: We examine the determinants of game attendance at Major League Baseball games during the period 1991-2003 (excluding 1995) to examine the impact that adding a wild card format in 1995 had on attendance. Critics of this format claim that it diminishes the importance of divisional races since runners-up in the division can still make the playoffs by winning the wild card. Proponents of the format claim that the format draws more fan interest in teams that otherwise have no shot at the playoffs. Our evidence supports the claims of critics and proponents.

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We would like to thank the Toronto Blue Jays who contributed financially to the project from which this research was performed.

1. Introduction

From 1969 to 1993, Major League Baseball's (MLB's) playoff format consisted of two rounds. The first round pitted the winners of each division of each of the two leagues. The winners of these rounds advanced to the World Series.

In 1993, MLB expanded to 28 teams by adding the Florida Marlins and the Colorado Rockies and in 1994, MLB switched to a 3-division format in each league. Starting in 1995, the winners of each division advanced to the playoffs along with a fourth team from each league dubbed a "wild card" team. The wild card team is the team with the best record that did not win its division. The first round of the playoffs in each league, called the divisional series, consist of two 5-game series played by the four playoff teams. The two winners of the divisional series in each league advance to their respective leagues' championship series. The winners of the championship series advance to the World Series.

Wild card teams have met with success in baseball. Between 1995 and 2006, five wild card teams advanced to the World Series and four have won: the Marlins in 1997 and 2003 (winners both times), the Anaheim Angels and the San Francisco Giants (the Angels won) in 2002, and the Boston Red Sox in 2004 (the Red Sox won).

Despite the wild card teams' success, the wild car format has its critics. They contend that the very existence of the wild card race makes the divisional races less important. Supporters of the wild card format argue that wild card races generate fan interest for teams that otherwise would not be in contention for a playoff spot.

In this paper, we examine this issue empirically by examining the determinants of game attendance in MLB with particular attention given to divisional and wild card races. If critics are correct, we should find evidence of less fan interest in divisional races during wild card years. If the wild card supporters are correct, we should find evidence of more fan interest for teams in the wild card hunt. The empirical analysis provides evidence for both sides of the argument.

The rest of the paper is organized as follows. Section 2 presents the literature review. Section 3 presents the empirical model and the data sources. Section 4 presents the empirical results. Section 5 concludes.

2. Literature Review

Numerous papers have been written on attendance in sports. A central focus of this research has been the examination of the elasticity of demand for sporting events. A consistent but controversial finding in this research is the finding that average ticket prices are set in the inelastic portion of the demand curve. The interested reader is directed to Fort (2004) and Brook (2006) for summaries of this research.

Other attendance studies focus on the relationship between competitive balance and attendance Schmidt and Berri (2001). Another focus of attendance studies is the examination of the “honeymoon effect” of new stadiums and arenas (for example see Leadley and Zygmunt (2006), Clapp and Hakes (2005), and Feddersen, Maenning, and Barcherding (2006). Lastly, Schmidt and Berri (2002 and 2004) as well as Matheson

(2006) and Coates and Harrison (2005) examine the impact of labor strikes on attendance in sports.

The aforementioned papers examine annual attendance data. Others have focused on the determinants of attendance at games. Garcia and Rodriguez (2002) examined attendance at Spanish soccer league games to explore such issues as price elasticity and model specification. Owen and Weatherspoon (2004) study attendance at Super 12 Rugby Union to address the relative lack of studies on rugby attendance. They also examine uncertainty of outcome issues and they employ general-to-specific modeling to identify game attendance determinants. Donihue, Findlay, and Newberry (2007) explore the demand for MLB spring training games.

The paper on game attendance most-comparable to the present study is Rascher (1999). Rascher explores the determinants of attendance at MLB games during the 1996 season. Using a vast set of variables, he examines the extent to which fans care about absolute quality of competition (referring to the total amount of talent on the field) and the relative quality of competition (the closeness of competition between the teams on the field). He finds that fans care about both types of competition, but they prefer to see the home team win.

Our analysis presented below is similar to that of Rascher in that we examine the demand for baseball games, but it differs in focus as well as the data period examined. Our focus is to explore the effect of the wild card format on attendance and we use data from a longer period in our study. In the next section, we describe our model and the data sources.

3. The Empirical Model and the Data

The demand for particular games will be a function of general demand factors such as the drawing population of the home team's city, ticket prices, and the per-capita income of the home team's drawing city as well as other demand factors particular to baseball games. We therefore postulate the following demand function to be estimated.

$$A_{gibt} = X_{it}\beta + Y_{gibt}\gamma + \varepsilon_{gibt} + \mu_{it}.$$

(1)

A_{gibt} stands for the attendance at game "g" played by home team "I" in year "t."

In our examination, we split each season into ten 16-game blocks¹, the subscript b referring to block "b." We do this because we hypothesize that fans will put different weights on the various demand factors at different points in the season. For example, the weight that fans place on the home team's performance in the previous season is likely to be different in the early part of the season relative to the last part of the season.

Our data consist of a mixture of annual data and game-specific data. X_{it} represents a matrix of annual variables for home team i in year t hypothesized to affect attendance. The values of these annual variables are constant for every home game played by a team in a given year. These annual variables include the population and per-capita income of the home team's SMSA and the weighted average ticket price of each team's home games gathered by the late Doug Pappas. We also include the home team's previous season's winning percentage to control for fan expectations about the home team. We also include the age of the stadium at the beginning of the year to control for any honeymoon effect associated with the stadium. We also include controls for

honeymoon effects associated with the home team per-se by including the age of the team and the number of years the home team has been in its current city. These three honeymoon controls are added quadratically in the model.

The annual variables also include dummies equal to one for the following situations: if the home team won the wild card in the previous season, if the home team won the division in the previous season, and an interaction term between the division winner dummy and a dummy equal to for wild card years. This term allows us to estimate the impact that the wild card format has on fan attitudes towards division winners.

We also include a dummy equal to one for games played in 1994, the year that the players went on strike. They struck on August 12th of that year, which corresponds to the 8th 16 game block in that year. If fans expected that block to correspond to the last set of games that season, they would be more likely to attend games in that block in 1994. Note that data from the strike shortened 1995 season are dropped from the analysis. The 1995 season began on April 25th of that year, approximately 3 weeks later than normal, and only lasted for 144 games. Because the blocks in the 1995 season do not align with the blocks in the other seasons in the analysis, data from 1995 was dropped.

Y_{gibt} represents a matrix of variables for game “g” played by home team “i” in block “b” in year “t” hypothesized to affect attendance, referred to as “per-game” variables. Note that we include the same general variables for both the home and visiting teams in each game. We include the winning percentage as measured at the beginning of each game. We also include cumulative measures of team batting and pitching performance in the current season as measured at the beginning of each game: slugging

percentage, on-base percentage, and strikeout-to-walk ratio. We also include the winning percentage of the visiting team from the previous season. This latter variable is not considered an annual variable because many different visiting teams play in a given home ballpark.

We include dummies equal to one for visiting teams that won their division in the previous season and an interaction between this variable and a dummy equal to one if the current season is a wild card year. This term allows us to estimate the impact that the wild card format has on fan attitudes towards visitors who were their respective divisions' winners.

We include dummies equal to one for opening day games, for interleague games (games played between American and National League teams), for night games, and for weekend games (Friday, Saturday, and Sunday games). We also include dummies equal to one if the visiting team was the Chicago Cubs, New York Yankees, and Boston Red Sox. Each of these teams has a national following and draw well on the road.

We also include a dummy equal to one if the visiting team was the Atlanta Braves. Besides being a team whose games are broadcast on a national cable outlet (TBS), they were the dominant team in the National League East throughout the sample period. This dominance is hypothesized to positively affect the demand for games when they are the visiting team.

We also include a dummy equal to one for games where the visiting team is St. Louis Cardinals and for games where the San Francisco Giants are the visitors. Both of these teams had pre-eminent home run hitters on their rosters for a portion of the sample

period: Mark McGwire on the Cardinals and Barry Bonds of the Giants. The dummies control for any demand effects associated with these teams.

We also include a dummy equal to one if the visiting team was the Tampa Bay Devil Rays. Tampa Bay entered MLB in 1998 in a relatively small market and has had little success on the field since their inception. The dummy controls for any negative demand affect associated with this team.

We also include dummies to control for the home run chases of 1998 and 2001. We set dummies equal to one if the visiting team was the St. Louis Cardinals or the Chicago Cubs and the year was 1998. The Cardinals' Mark McGwire and the Cubs' Sammy Sosa were locked in an engaging pursuit of Roger Maris' season home run record that had stood since 1961. McGwire claimed the crown by hitting 70 home runs.

Just three years later, The Giants' Barry Bonds broke the record set by McGwire by hitting 73 home runs. To control for this chase, we set a dummy equal to one when the visiting team is the Giants and the year is 2001. Each of these dummies controls for road demand effect of the home run chases.

To measure the effect of the wild card and divisional races during each year, we include games behind the division leader and games behind the wild card leaders for both the home and visiting teams as measured at the beginning of each game. Games behind the division is included quadratically for home and visiting teams because even as teams fall far out of the division races, fans still attend games. Games behind the wild card is set to 0 for non wild card years.

To control for the effect of the wild card on division races, we interact games behind the division with a dummy equal to one for all wild card years. We interpret a

positive coefficient as evidence that the wild card makes division races less important to fans. We expect that as a team falls out of the divisional races, fewer fans attend games. If the wild card lessens the impact of the races, this attendance drop should not be as large.

To control for the effect of the wild card race per-se, we include games behind the wild card leader, but only for teams that do not lead their divisions. This measure was interacted with a dummy equal to one for wild card years, allowing for non wild card years to be a control.

Our data did not allow us to include measures for the weather at the beginning of each game. However, our use of 16-game blocks will roughly help control for general weather conditions. For instance, the weather in northern cities is cooler in April than in September. Block 1 corresponds to April games and block 10 corresponds to the warmer September games.

All financial variables are in real 2003 dollars. Ticket prices were obtained from the late Doug Pappas and represent weighted average ticket prices calculated using section sizes as weights. Population and per-capita income values for US cities were obtained from the Bureau of Economic Analysis's Regional Economic Information System. Data for Canadian cities was obtained from Statistics Canada. All team productivity variables were generated using data obtained from Retrosheet.org. The age of the stadium was calculated by the authors using data obtained from Ballparks.com. Team ages and the length of time in cities was calculated by the authors using data from mlb.com.

Since attendance and ticket prices will be simultaneously determined, we estimate a first-stage regression on the logarithm of annual ticket prices using the following variables as regressor: the logarithm of the population of the home city, the logarithm of the per-capita personal income of the home city, the previous year's winning percentage of the home team, the age of the stadium (in quadratic form), the capacity of the stadium (in quadratic form), and year dummies equal to one for the years 1991-2000. We included dummies for 2001 and 2002 but found them to be insignificant and we therefore dropped them from the model. To control for the panel nature of the annual data, we used a random effects AR1 model in the first stage regressions. We calculated predicted values based on this regression and used them in the second stage. Lastly, robust standard errors were calculated in the second stage.

4. Empirical Analysis

First Stage Results

Table 1 presents summary statistics for the annual variables in the analysis. Table 2 presents the results of the first stage regression on ticket prices. All the coefficients have the expected signs and all but the intercept are significant at the 5% level or better. Per-capita income, population, and previous season win percent are all positively correlated to ticket prices. As stadiums age, ticket prices decrease but at a rate that levels off, a finding consistent with the honeymoon effect of stadiums. As a stadium increases in capacity, ticket prices fall, a fall that also levels off as capacity increases. Lastly, the

negative coefficients on the year dummies show that real ticket prices were lower from 1991-2000 relative to 2003. In every year but 1995, the coefficient estimate is larger compared to the coefficient of the previous year suggesting ticket prices rose over time. The lower coefficient in 1995 relative to 1994 is likely due to teams setting lower ticket prices to entice fans back after the 1994-1995 players' strike.

General Demand Factors

Tables 3A and 3B present the regression results from the second stage analysis of game attendance. Table 3A presents the results for blocks 1-5 and the results for blocks 6-10 are presented in Table 3B. In every block, the coefficients on population are positive and significant suggesting that cities with higher population have a higher attendance level per game, all else equal. Consistent with the law of demand, ticket prices and attendance are negatively related. Although the results are not presented here for brevity, a separate regression on log attendance provides evidence for the consistent pricing of inelastic pricing. The coefficients on real per-capita income are positive and highly significant suggesting baseball games are a normal good.

The regressions suggest that attendance falls as stadiums age, a finding consistent with the honeymoon effect of stadiums. This fall levels off over time as noted by the positive and significant coefficient on the quadratic term of stadium age.

The negative coefficients on team age and the positive coefficients on its quadratic term suggest that as a team ages, attendance falls but at a rate that levels off over time. This evidence suggests that there are honeymoon effects associated with

teams per-se. The coefficients on years in the city and its quadratic term are all insignificant. This is likely due to correlation between a team's age and the number of years it has been in its current city.

The coefficient on stadium capacity is positive and significant in every block suggesting that as a stadium's capacity increases, attendance increases. For instance, if a team adds 1,000 seats to its capacity, it can expect on average to have an additional 264 fans in block 1 games on average and 241 fans in block 10 games.

Team Win Percent

Previous year win percents are important determinants in team attendance and this is especially true for the home team. The coefficients in each block are higher for the home team than the visiting team. Consider block 10. A home team that won 10% more of its games would draw about 2,800 more fans to its games. If the visiting team has won 10% more of its games, the home team would draw approximately 1,842 more fans. In other words, fans care about the absolute quality of play: the better the home and visiting team are, the more interest fans have in the game. But consistent with Rascher's finding, fans want to see the home team win.

The current year's win percentage coming into the game is also an important determinant in many blocks. For the home team, this coefficient is positive and significant in blocks 2, 3, 5, 6, and 8. It is insignificant in all other blocks. One potential reason for the insignificance in blocks 9 and 10 is that its effects are captured by other variables in those blocks. For the visiting team, the coefficient is positive in all blocks

and significant in blocks 1, 3, and 5 – 10. In the latter half of the season (blocks 6-10) the estimated coefficient on visiting team win percent is higher than the respective coefficients on home team win percent. Part of this is potentially explained by expectations home teams have in explaining attendance. Teams play a variety of visiting teams in their schedules and the data suggest that home team fans are more responsive to changes in visiting team win percents, especially later in the season.

Offensive/Defensive Performance

Home team slugging percentage is an important determinant of attendance, being positive and significant in all blocks except for the first block. The visiting team slugging percentage is positive and significant in blocks 5, 9, and 10 but is insignificant in all other blocks. Moreover, the coefficients for the visiting team in blocks 5, 9, and 10 are smaller than the respective coefficients on home team slugging percentage suggesting that the home fans care about home power, but not as much for visitors because slugging helps them beat the home team.

Home team on-base percentage is insignificant for most blocks. When it is significant (blocks 7 and 9) it is negative. A similar finding occurs with the visiting team on-base percentage (except that the coefficients are negative and significant in blocks 3, 5, and 8. Many analysts use the statistic on-base-plus-slugging-percentage – OPS for short – as a measure of hitter productivity, implicitly weighing each measure the same in terms of measuring a player’s contribution to winning. However, our evidence suggests that from paying fans’ point of view, they are not equally weighted.

Consider block 4. An increase in home team slugging percentage by 10 points (for example, from 0.450 to 0.460) drives estimated attendance up by 546 fans on average. A similar change in on-base percentage would drive attendance up by an estimated 21 more fans.

The coefficients on home team strikeout-to-walk ratio are positive and for the home team in blocks 2, 3, and 5 and negative in all other blocks. It is significant in blocks 7 and 8. The evidence suggests that fans care little for this factor and may actually obtain some disutility all else equal.

Other Demand Factors

The coefficients on the interleague dummies are positive for all blocks in which such games were played. The results suggest that if a game were interleague, between 1,520 and 5,234 more fans on average would attend it.

Not surprisingly, opening day draws more fans than other games, nearly 20,874 fans on average. Night games generally draw as well or less than day games. The relative paucity of weekday day games may make them a novelty from fans' point of view, drawing more fans to games. Weekend games draw more fans, between 4,717 and 7,294 games depending on the block.

The results tell us that the Chicago Cubs draw well on the road, drawing between 2,394 and 5,513 more fans on average per game. The Yankees also draw well on the road. The results on the other teams are mixed.

1994 was an especially good year in terms of per-game attendance in block 8. But the reason for the large and significant coefficient was anything but positive for baseball fans. 1994 was the year the players struck, effectively ending the baseball season in block 8. The evidence suggests that fans anticipated this work stoppage, and they reacted by attending more games: an additional 5,500 fans came to games on average in that block in that year relative to all other years in the sample.

The results suggest that fans became interested in the home run chase in 1998 in block 5, interest that took off in the latter portion of that season. When the Cardinals were on the road, they drew approximately 8,800 more fans in block 7 and 24,418 more fans in block 10, most coming to see Mark McGwire attempt to make history. While the Cubs generally draw well on the road, they really drew well in the latter stages of 1998 as Sammy Sosa threw his hat in the home run ring along with McGwire. When the Cubs were the visitors in 1998 in blocks 9 and 10, a respective 9,144 and 12,907 additional fans attended their games on average. The smaller attendance effects for the Sosa home run chase is likely due to the Cubs already drawing well on the road, even without Sosa's assault on the home run record. Lastly, Barry Bonds' home run chase 3 years later also captured the interest of fans, but not until block 10. This is reasonable because Bonds did not break McGwire's record until very late in the 2001 season. When the Giants were on the road that year in that block, an additional 13,055 fans attended games. Moreover, since Bonds was relatively less popular than McGwire, the attendance effect of the Bonds chase was below that of McGwire's chase.

The Division and Wild Card Races

According to Table 3A, the estimates on the number of games behind the division leader a home team is are negative and significant in blocks 1, 4, and 5 signifying that the farther a home team is behind the division leader, the lower its attendance. The estimate for block 1 is highly significant while those for blocks 4 and 5 are also significant, but not highly so. One justification for the estimate in block 1 is that fans may be more sensitive to team relative performance very early in the season relative to the middle part of the season. If a team performs poorly early on, fans may interpret this as a signal that the team is a poor team. But as the season wears on and the home team fluctuates in performance, fans may become more forgiving.

In Table 3B, all the estimates on the games behind variable for home teams are negative and are highly significant for blocks 7-10. The findings thus suggest that division position becomes very important late in the season, a result that is unsurprising. The coefficient on the quadratic term of games behind the division is positive in blocks 1, 4, and 5-10 and insignificant in all other blocks. This suggests that as the home team falls further and further behind the division, the resulting drop in attendance levels off. All else equal, fans still come to games.

Now we turn our attention to the games behind division-wild card year dummy interaction for the home team. The parameter estimates for this variable are significant for blocks 1, 3, 4, and 8 – 10 and insignificant for all other blocks. The estimates are positive for blocks 3 and 4 but negative for blocks 1 and 8 – 10. We interpret these findings as evidence that the wild card has impacted divisional races in a negative way,

especially late in the season, where the home team is concerned. As a home team falls out of the division race, attendance falls but its fall is not as sharp in the wild card years.

Table 4 presents mean estimates for various games behind values for the home team in blocks 8, 9, and 10. Relative to leading the division, if a team is one game out of the division in block 9, its attendance falls by 547 fans in non-wild card years. In wild card years, attendance is only down an average of 212 fans. When a team falls 8 games out of first, its attendance is 3,863 less in non-wild card years and 1,183 in wild card years.

The coefficients on the games behind the wild card variable for home teams are negative for all blocks except block 3 (which is insignificant). The estimates are significant for blocks 1 and 8-10 signifying that, for those blocks, as a home team falls further out of the wild card race, attendance falls. For instance, as the home team falls one additional game out of wild card contention, 161 fewer fans attend games in block 8. In block 10, 420 fewer fans attend each game as the home team falls and additional game out of the wild card race. Putting this into another perspective, adding the wild card increases fan interest in the home team per-se, although some of this comes at the expense of the interest in any division race.

The coefficients on the games behind the division variable for visitors are significant for blocks 1, 2, 7, 9, and 10 and are positive in each of these blocks. All other estimates are insignificant. The estimates on this variable's quadratic terms is significant for blocks 3, 5, 6 and 8 – 10 and insignificant in all other blocks. The coefficients are positive in blocks 3, 5, 6, 8, and 10 and negative in block 9. Taken together, these estimates suggest that as visiting teams fall further behind their divisions in non wild card

years, home attendance rises at an increasing rate in blocks 3, 5, 6, 8, and 10 and rises at a decreasing rate in block 9. One interpretation is that home fans expect the home team to have a better chance to win a particular game the less the visiting team has to play for in terms of winning the division. In wild card years, however, the increase in home attendance is tempered. In all blocks, the estimates on the games behind the division-wild card year dummy for visiting teams is negative suggesting that the rise in home team attendance is less in wild card years as opposing teams fall out of their respective division races.

Table 5 presents mean estimates for various games behind values in blocks 8, 9, and 10. In non-wild card years, home attendance rises as the visiting team falls further out of the division race. But in wild card years, home attendance rises by a smaller amount in block 9 and actually falls in blocks 8 and 10.

Returning to Tables 3A and B, the coefficients on games behind the wild card for the visiting team is significant for blocks 7-10 and positive in each of those blocks. This suggests that the farther the visitor falls out of the wild card race, the higher the home attendance will be. One interpretation is that home fans have better expectations that the home team will win as the visitor falls further out of the wild card race.

Similar results are found by examining the coefficients on the division and wild card winner dummies from the previous season. The coefficient on the division winner dummy for the home team is positive and significant in every block except block 10, which is positive and insignificant. This suggests that when a team wins its division, its attendance per game will be higher in the subsequent year, except at the end of that year. The coefficient on the interaction between the division winner dummy for the home team

and the wild card year dummy is negative in every block and significant in blocks 3, 4, and 6 – 9. This suggests that for these blocks, attendance is higher for division winners but less so when the current year is a wild card year. In block 9, for example, attendance is 2,747 higher per-game in non wild card years but only 603 fans higher in wild card years. For blocks 1, 2, 5, and 10 it appears that the wild card years did not impact fan attendance with respect to being the division winner.

If the home team won the wild card last year and the current year is a wild card year, attendance is higher in each block. It is significant in blocks 1, 2, 3, 5, and 8 – 10. These results taken together with the estimates on the division winner dummy suggests that fans care about the wild card, but in part at the expense of the division races.

The coefficient on the division winner dummy for visitors is positive and significant in blocks 4 and 6 – 8. The coefficient on the division winner in the wild card year for the visitor is negative in all blocks and significant in blocks 2, 3, 5, 6, 7, and 8. If the visitor won the wild card is negative and significant in only blocks 7 and 10.

5. Conclusion

We examine the determinants of game attendance in Major League Baseball games during the period 1991-2003 (excluding 1995) to examine the impact that adding a wild card format in 1995 had on attendance. Critics of this format claim that it diminishes the importance of divisional races since runners up in the division can still make the playoffs by winning the wild card. Proponents of the format claim that it draws

more fan interest in teams that otherwise have no shot at the playoffs. Our evidence supports the claims of critics and proponents.

A policy implication is that adding more wild card teams to the playoffs would draw more interest to teams that have trouble making the playoffs under the current format. However, such a change would possibly draw further fan interest away from the divisional races and from the wild card races as they currently exist in MLB.

¹ Each team in MLB usually plays a 162 game schedule. The last two games of the season are placed into the last block of games, making block 10 an 18-game block. Blocks 1-9 consist of 16 games.

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Table 1 - Summary of Year-Constant Variables

Variable	Obs	Mean	Std. Dev.
Stadium Capacity	372	50272.12	7913.738
SMSA Population	372	5341997	4388725
Stadium Age	372	28.06989	24.09249
Age of Team	372	70.02419	42.52587
Years in City	372	55.1371	39.78195
Real Ticket Price	372	15.30034	4.810292

Table 2 - First Stage Regression Results

<i>Dependent Variable: Log of Real Ticket Prices (BY = 2003)</i>	<i>Estimate (Std. Err. Below)</i>
Log of Real Per-Capita Income	0.4218407*** 0.0960137
Log of SMSA Population	0.0975124*** 0.0345269
Previous Season WPCT	0.3273496*** 0.0750614
Stadium Age	-0.0099024*** 0.0016421
Stadium Age Quadratic Term	0.0000966*** 0.0000212
Stadium Capacity	-0.0000316*** 0.0000114
Stadium Capacity Quadratic Term	0.00000000257** 1.06E-10
d1991	-0.3299403*** 0.0332811
d1992	-0.3058905*** 0.032715
d1993	-0.2829925*** 0.0329162
d1994	-0.2411287*** 0.0321919
d1995	-0.2653507*** 0.0312875
d1996	-0.2466641*** 0.0302275
d1997	-0.2382438*** 0.0282946
d1998	-0.1532145*** 0.0258118
d1999	-0.099567*** 0.0231103
d2000	-0.0827357*** 0.0177856
Intercept	-2.109935* 1.099067
R-sq: within	0.7545
between	0.5015
overall	0.651
Wald chi2(18)	339.3
rho_ar (estimated autocorrelation coefficient)	.6737522
sigma_u	0.09534581
sigma_e	0.08857497
rho_fov (fraction of variance due to u_i)	.53676407

***Significant at better than 1%

**Significant at better than 5%

*Significant at better than 10%

Table 3A - Second Stage Regressions Results: Blocks 1 - 5

Dependent Variable: Attendance

	<i>Estimates (Std Err Below)</i>				
	Block 1	Block 2	Block 3	Block 4	Block 5
SMSA Population	0.0002403*** 0.0000588	0.0003608*** 0.0000538	0.0003356*** 0.0000523	0.0003501*** 0.0000528	0.0003793*** 0.0000553
Real Ticket Price - Predicted	-251.3637** 128.2453	-335.1319** 144.0854	-343.7189** 139.6351	-512.7216*** 137.2855	-504.2487*** 143.0211
Real Per-Capita Income	0.1732602*** 0.0506815	0.2544545*** 0.0550605	0.238776*** 0.05669	0.2507545*** 0.0529822	0.3282996*** 0.0577201
Stadium Age	-536.3827*** 40.8597	-553.6966*** 45.84518	-539.21*** 43.78462	-550.743*** 42.75094	-552.9657*** 42.58881
Stadium Age - Quadratic	5.677165*** 0.4348858	5.542637*** 0.48742	5.422986*** 0.4632053	5.529263*** 0.4514935	5.674793*** 0.4450378
Age of Team	-114.3435* 60.73945	-164.5052** 69.24883	-141.5019** 64.97232	-117.8125** 57.44045	3.629899 59.74854
Age of Team - Quadratic	0.9727996** 0.4148467	1.456456*** 0.4732639	1.184683*** 0.4463442	1.002274** 0.3909012	0.160069 0.4082207
Years in Current City	-112.989* 63.30123	-73.71688 69.64797	-97.52076 65.39942	-46.14385 59.41803	-163.0101*** 62.00371
Years in Current City - Quadratic Term	0.4946248 0.4330441	0.2768323 0.4767362	0.6095659 0.4484461	0.3009556 0.4045707	1.142951*** 0.4245702
Stadium Capacity	0.2635497*** 0.0324493	0.1352651*** 0.0313041	0.0965664*** 0.0298502	0.1030353*** 0.0295676	0.2254713*** 0.0305344
Home Team WPCT - Previous Season	34297.66*** 3701.606	34024.09*** 3646.825	28602.83*** 3662.823	27730.45*** 3561.168	25573.41*** 3721.121
Home Team WPCT - Cumulative Season	1066.094 1011.184	6784.286** 3304.822	12957.31*** 4260.134	6556.373 4660.801	16369.63*** 6036.59
Visiting Team WPCT - Previous Season	14220.06*** 3831.625	9880.673** 3861.334	8502.661** 3872.803	3013.21 3715.967	13726.05*** 4168.105
Visiting Team WPCT - Cumulative Season	2622.948*** 963.1648	12332.04*** 3374.703	4749.94 4450.129	2834.116 5300.315	19170.79*** 6265.539
Home Team Slugging Percent - Cumulative Season	6090.973 3732.709	36463.59*** 6932.723	31306.21*** 8201.998	54625.08*** 8407.848	39363.27*** 9503.253
Home Team Strikeout-to-Walk Ratio - Cumulative Season	-7445.054 6783.543	15075.76 15077.43	19971.81 16762.98	-14622.16 17967.68	-23573.71 21499.77
Home Team On-base Percent - Cumulative Season	354.2746* 197.5587	2244.07*** 477.934	1716.365*** 556.5336	2068.239*** 581.3949	844.4887 635.9384
Visiting Team Slugging Percent - Cumulative Season	4715.501 3860.359	-9353.42 6293.387	13793.14* 7576.383	6162.212 8243.028	31365.45*** 9213.592
Visiting Team On-base Percent - Cumulative Season	-9200.125 7102.331	13202.74 13543.06	-40772.95** 16550.34	15192.76 17429.49	-62834.83*** 20264.51
Visiting Team Strikeout-to-Walk Ratio - Cumulative Season	-39.37732 200.9414	-408.7304 471.2695	206.5713 526.084	701.8314 603.2791	1807.244*** 635.2422

Table 3A - Continued

Games Behind Division - Home Team	-1580.274***	273.7996	180.0885	-227.9527*	-215.6829**
	309.9031	217.7106	172.3727	131.2593	113.9765
Games Behind Division Quadratic Term - Home Team	101.417**	-9.596025	1.293562	24.61656***	6.301547
	40.02414	16.39844	10.69164	6.350265	4.120524
Games Behind Division - Wild Card Interaction - Home Team	1160.485***	-86.31153	-239.1134*	-353.5814***	-4.544683
	304.0233	186.7141	138.9172	117.9125	108.8318
Games Behind Wild Card - Wild Card Interaction - Home Team	-1037.195***	-144.8843	32.46089	-96.02486	-118.9198
	288.5366	185.8873	125.6975	97.2354	96.72323
Games Behind Division - Visiting Team	694.6778**	1054.596***	-102.2278	83.78583	65.20563
	329.8621	214.3834	173.0771	133.323	110.3275
Games Behind Division Quadratic Term - Visiting Team	22.31769	-22.85428	27.61816***	8.692533	15.58671***
	46.88457	15.14475	10.13467	5.418886	3.65365
Games Behind Division - Wild Card Interaction - Visiting Team	-474.7035	-683.6559***	-230.3152*	-65.42849	-408.7137***
	333.9952	193.0244	139.3543	115.0549	101.2251
Games Behind Wild Card - Wild Card Interaction - Visiting Team	-202.2694	271.9532	-192.0615	-159.3372	79.54112
	301.1512	190.772	126.0268	110.7267	96.40951
Wild Card Winner Last Season - Current Season is Wild Card - Home	4724.983***	2464.912***	3776.677***	972.9109	4659.162***
	983.3685	931.7737	975.1401	955.0773	790.6574
Division Winner Last Season - Home	2295.283**	3223.768***	4549.902***	4278.53***	1964.059**
	1084.849	1058.929	974.7178	974.043	936.4101
Division Winner Last Season - Current Season is Wild Card - Home	-828.4456	-1644.695	-2293.326**	-2343.028**	-61.56817
	1146.991	1120.644	1041.837	1047.859	1014.412
Wild Card Winner Last Season - Current Season is Wild Card - Visitor	133.2425	-234.301	-384.9387	-345.0526	-630.5942
	910.2321	1015.078	921.7005	938.3834	1051.204
Division Winner Last Season - Visitor	103.7391	1167.219	1624.115	2784.838***	976.0814
	1024.268	979.6654	1007.169	958.6596	1073.052
Division Winner Last Season - Current Season is Wild Card - Visitor	-599.5194	-4043.051***	-2112.741*	-1143.546	-2819.543**
	1037.633	1054.7	1112.889	1046.59	1095.463

Table 3A – Continued

Interleague Dummy	-	-	-	1520.707***	2674.442***
Opening Day Dummy	20783.61***	-	-	449.5304	498.9935
Night Game dummy	650.5829				
	-314.7074	-378.762	-1517.508***	-1372.505***	-244.3311
	400.6953	416.1261	399.3262	392.3794	388.1887
Weekend Dummy	5467.747***	7164.258***	6728.705***	7733.474***	6106.543***
	385.2705	386.6879	367.0764	368.6283	362.065
Cubs Dummy	2394.079**	5165.536***	5190.562***	2986.833***	3488.072***
	1154.181	1060.318	1074.069	965.1916	1112.71
Yankees Dummy	636.6442	6263.286***	1898.379**	4368.896***	5800.771***
	893.5964	1139.504	942.4799	926.7599	898.0031
Red Sox Dummy	1563.498*	2865.397***	56.01928	204.0053	140.6605
	947.2622	1051.614	998.1503	886.4688	1002.771
Braves Dummy	2065.751*	7515.793***	831.6566	-227.6502	-1273.772
	1095.589	1222.841	1065.233	1044.983	981.0732
Devil Rays Dummy	4081.908***	-1611.515	4900.471***	-3340.155***	-3849.983**
	1363.678	1217.78	1004.77	1058.65	1548.989
Cardinals Dummy	373.9675	2876.545***	-573.5589	3573.614***	984.2628
	917.237	1322.196	986.25	1059.586	1040.919
Giants Dummy	505.7079	736.295	-79.1956	3434.326***	8189.919***
	1084.373	1110.576	1176.543	873.3037	1435.945
d1994	2113.289***	1121.864	2461.974***	-189.6772	1344.805*
	743.5494	695.3351	769.8383	733.1109	778.4726
Cubs - 1998	-4807.862	6741.855	4810.099	-8081.323***	3009.385
	4576.259	4298.425	4242.547	2262.299	3826.039
Cardinals - 1998	-1135.482	-3153.342	2760.486	4102.921	9595.587***
	4904.577	2136.043	1925.793	3691.914	2624.169
Giants - 2001	10544.16***	2526.471	-6811.811***	2556.656	-1286.972
	3255.244	1774.266	2565.25	3101.233	3139.116
Inercept	-6912.776*	-35729.1***	-15191.31**	-21385.25***	-20965.82***
	4025.359	5721.789	6180.65	6473.523	7627.804
R-squared	0.5059	0.441	0.428	0.4626	0.4338

***Significant at better than 1%

**Significant at better than 5%

*Significant at better than 10%

Table 3B - Second Stage Regressions Results: Blocks 6 - 10

Dependent Variable: Attendance

	<i>Estimates (Std Err Below)</i>				
	Block 6	Block 7	Block 8	Block 9	Block 10
SMSA Population	0.0004153***	0.0002999***	0.0003876***	0.0003156***	0.0002079***
	0.0000559	0.000051	0.0000516	0.0000548	0.0000554
Real Ticket Price - Predicted	-410.4446***	-422.8935***	-499.7974***	-576.3635***	-534.0611***
	145.6132	130.0004	130.0266	141.2928	135.0915
Real Per-Capita Income	0.2429442***	0.2948655***	0.2308113***	0.2472566***	0.2253444***
	0.0562039	0.0512306	0.0561058	0.0555768	0.0550213
Stadium Age	-513.3638***	-530.3833***	-565.0495***	-580.9752***	-503.2166***
	43.55576	39.4366	41.69383	45.11809	40.70086
Stadium Age - Quadratic	5.277763***	5.756886***	6.226974***	6.304886***	5.710198***
	0.4609658	0.414001	0.4358819	0.4740382	0.4452425
Age of Team	-198.858***	-140.6804**	-139.1158**	-102.8306*	-188.1222***
	62.13353	60.57917	61.61479	61.13149	63.61865
Age of Team - Quadratic	1.607679***	1.036949**	1.131104***	0.8647374**	1.566898***
	0.4286009	0.4179361	0.4291122	0.4166687	0.4371971
Years in Current City	42.09666	34.78641	16.67055	-1.302476	-1.435871
	64.32694	62.40307	62.76443	61.81376	65.00399
Years in Current City - Quadratic Term	-0.3334657	-0.2347877	-0.2302918	-0.0732008	-0.3125127
	0.4440786	0.4304074	0.436419	0.4212478	0.4483209
Stadium Capacity	0.1926598***	0.2214804***	0.1872526***	0.1424412***	0.2409867***
	0.0316373	0.0297202	0.028804	0.0293913	0.0323013
Home Team WPCT - Previous Season	32715.67***	35541.86***	23147.36***	29557.99***	27970.01***
	3788.693	3471.777	3723.893	4126.208	3887.705
Home Team WPCT - Cumulative Season	16148.48**	5510.054	14121.33**	8177.581	-8768.965
	6447.762	7076.225	7181	8019.543	10103.12
Visiting Team WPCT - Previous Season	10547.84***	7658.951**	2428.226	5244.205	18424.17***
	3720.44	3665.542	3666.193	4011.948	4021.781
Visiting Team WPCT - Cumulative Season	22394.98***	38055.82***	30134.44***	35358.07***	79738.27***
	6803.369	6460.806	7555.873	8520.323	10428.08
Home Team Slugging Percent - Cumulative Season	46274.8***	72950.61***	69686***	53272.5***	64534.42***
	10691.56	10761.64	11465.77	12212.44	12145.49
Home Team Strikeout-to-Walk Ratio - Cumulative Season	13563.27	-59966.33***	-32217.02	-46195.67*	-43072.98
	23492.85	22135.01	24027.8	25253.98	26635.91
Home Team On-base Percent - Cumulative Season	777.6521	207.9371	470.5065	821.9	-2525.575***
	651.1129	629.3653	643.0094	682.2428	751.2416
Visiting Team Slugging Percent - Cumulative Season	-6338.999	4089.839	8226.931	19575.38*	18936.21*
	10450.75	9631.888	10322.36	10534.34	11437.34
Visiting Team On-base Percent - Cumulative Season	-13374.84	-10662.58	-45388.87**	25117.92	509.273
	22379.89	19878.22	22101.85	22546.52	24572.91
Visiting Team Strikeout-to-Walk Ratio - Cumulative Season	-295.6637	2144.561***	115.0122	1470.123**	1176.414
	666.7382	684.0817	698.8858	712.7612	807.2329

Table 3B – Continued

Games Behind Division - Home Team	-147.8763	-602.5023***	-506.4984***	-556.1119***	-853.7643***
	98.02475	91.6706	84.10104	85.41264	82.93703
Games Behind Division Quadratic Term - Home Team	5.042596*	13.69329***	7.866483***	9.157449***	10.53066***
	2.95522	2.521008	2.10872	1.787075	1.172619
Games Behind Division - Wild Card Interaction - Home Team	14.19441	16.45501	243.9658***	335.0141***	431.1865***
	101.0211	95.71816	86.95881	71.13154	66.18629
Games Behind Wild Card - Wild Card Interaction - Home Team	-117.2274	-56.46055	-160.5925***	-311.729***	-419.7136***
	91.95461	79.22651	64.98975	63.31914	59.65307
Games Behind Division - Visiting Team	28.98169	358.3494***	50.92285	402.548***	193.8782**
	103.9781	88.54318	93.91829	90.13127	83.84384
Games Behind Division Quadratic Term - Visiting Team	6.70039**	2.765292	10.68644***	-3.056252*	6.039682***
	2.942368	2.221322	1.962282	1.756163	1.311562
Games Behind Division - Wild Card Interaction - Visiting Team	-171.9528*	-459.2526***	-329.66***	-358.7205***	-299.2427***
	93.70537	73.9447	73.49485	70.25114	67.39402
Games Behind Wild Card - Wild Card Interaction - Visiting Team	98.98115	260.9404***	144.6291**	306.9507***	371.3261***
	96.11999	71.99419	64.75693	66.01125	62.49563
Wild Card Winner Last Season - Current Season is Wild Card - Home	1346.011	911.8229	3334.392***	4666.375***	2837.503***
	964.3843	938.9978	840.9353	930.5826	923.5168
Division Winner Last Season - Home	3570.886***	3891.036***	2859.89***	2747.07**	76.04024
	932.4501	799.7131	986.1056	1101.601	1081.637
Division Winner Last Season - Current Season is Wild Card - Home	-3567.616***	-4645.363***	-1990.505*	-2143.851*	-297.6968
	1002.3	880.1581	1040.653	1177.724	1137.176
Wild Card Winner Last Season - Current Season is Wild Card - Visitor	-119.4761	-2142.735***	262.278	881.7183	-1990.318**
	1001.551	740.1261	895.6981	951.2047	959.4743
Division Winner Last Season - Visitor	2640.858***	4171.585***	2840.905***	780.2954	-1621.151
	898.4014	848.2046	1059.624	1222.648	1162.667
Division Winner Last Season - Current Season is Wild Card - Visitor	-1615.115*	-4467.503***	-3718.981***	-1632.103	-897.4046
	982.0285	921.8699	1139.972	1221.834	1227.63

Table 3B continued

Interleague Dummy	2214.177***	-	-	5234.025***	-
	498.7747			1250.828	
Opening Day Dummy	-	-	-	-	-
Night Game dummy	251.4048	-388.576	-303.331	-184.4058	-767.5866*
	384.6618	364.9099	389.4231	402.0427	431.6914
Weekend Dummy	4934.198***	5351.5***	5832.235***	6698.605***	7294.504***
	364.6019	340.0657	349.2557	371.0981	392.1278
Cubs Dummy	4716.805***	4693.229***	3755.397***	2463.775**	5512.597***
	1326.425	990.2244	1222.705	1156.458	1124.996
Yankees Dummy	3115.594***	721.7041	5458.641***	3544.282***	2136.592**
	888.7678	966.4852	938.0531	1210.593	956.5689
Red Sox Dummy	89.86282	901.7681	724.5783	2127.89**	954.7259
	839.5609	782.0309	959.3019	931.8054	1242.569
Braves Dummy	-1736.199	-2082.023*	4144.128***	1160.944	-3344.747***
	1119.86	1113.682	1041.48	1099.785	1243.074
Devil Rays Dummy	-4373.011***	2589.017*	-1519.723	3644.127**	-3957.592***
	1483.869	1502.543	1053.196	1660.383	1178.5
Cardinals Dummy	3710.742***	369.8148	1123.766	3368.285***	2746.832***
	1144.024	1110.886	931.9378	1016.427	841.4829
Giants Dummy	3572.27***	1919.905*	-1566.187*	1467.296	4794.281***
	963.6382	1068.946	944.3407	1006.292	981.4884
d1994	197.9009	881.1722	5506.032***	-	-
	789.1863	743.162	2114.88		
Cubs - 1998	3252.088	5328.561	9131.766**	9144.435***	12907.24***
	5115.552	4478.491	3587.267	2817.779	3889.674
Cardinals - 1998	2057.64	8801.212***	13592.57***	10700.39***	24417.5***
	4038.776	2326.223	1989.967	2676.81	2370.676
Giants - 2001	-814.8686	-1822.47	1058.985	2956.085	13055.31***
	2568.694	2240.144	1553.956	2114.742	3262.312
Inercept	-34214.53***	-32888.66***	-15806.4**	-42129.05***	-50888.65***
	8198.477	7603.553	7240.08	8774.801	9680.979
R-squared	0.3984	0.4588	0.4782	0.4776	0.4964

***Significant at better than 1%

**Significant at better than 5%

*Significant at better than 10%

Table 4 - Mean Estimates of Attendance Change - Home Team Effects

Games Behind Division	Block 8		Block 9		Block 10	
	Non Wild Card Years	Wild Card Years	Non Wild Card Years	Wild Card Years	Non Wild Card Years	Wild Card Years
1	-499	-255	-547	-212	-843	-412
2	-982	-494	-1076	-406	-1665	-803
3	-1449	-717	-1586	-581	-2467	-1173
4	-1900	-924	-2078	-738	-3247	-1522
5	-2336	-1116	-2552	-877	-4006	-1850
6	-2756	-1292	-3007	-997	-4743	-2156
7	-3160	-1452	-3444	-1099	-5460	-2442
8	-3549	-1597	-3863	-1183	-6156	-2707
9	-3921	-1726	-4263	-1248	-6831	-2950

Table 5 - Mean Estimates of Attendance Change - Visiting Team Effects

Games Behind Division	Block 8		Block 9		Block 10	
	Non Wild Card Years	Wild Card Years	Non Wild Card Years	Wild Card Years	Non Wild Card Years	Wild Card Years
1	62	-268	399	41	200	-99
2	145	-515	793	75	412	-187
3	249	-740	1180	104	636	-262
4	375	-944	1561	126	872	-325
5	522	-1127	1936	143	1120	-376
6	690	-1288	2305	153	1381	-415
7	880	-1428	2668	157	1653	-442
8	1091	-1546	3025	155	1938	-456
9	1324	-1643	3375	147	2234	-459

