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RECESSION, UNEMPLOYMENT, AND ATTENDANCE AT MAJOR LEAGUE BASEBALL GAMES

A Thesis

Submitted

in Partial Fulfillment

of the Requirements for the Designation

University Honors

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I. Introduction

When a country experiences an economic downturn, as the United States has since late 2007, the negative effects are widespread. Workers are laid off, and households and firms spend less due to decreased income. In most industries, revenues and profits decline during recessions, and professional sports franchises may be no different. In a period of high unemployment, one would expect that consumers first cut back on recreation and entertainment. This study was designed to determine the impact of unemployment on one such entertainment activity, Major League Baseball games.

Previous studies indicate factors that may have a significant impact on attendance at professional sporting events, including team success and the presence of star players on the roster. The purpose of this project was to quantify the impact of unemployment on attendance at Major League Baseball games. Its importance was to determine if fan attendance is partly under control of team management or if it is also impacted by larger systematic factors. What impact does unemployment have on Major League Baseball, and is the state of the economy one of the main determinants of fan attendance?

Through analysis of data from the years 2000 to 2009, I evaluated the impact of economic conditions and unemployment on attendance at Major League Baseball games. I hypothesized that fan attendance at baseball games was impacted by the unemployment conditions of the region. Using the results from this analysis, I was able to determine whether or not a relationship existed between the two variables. As we will see, the results that came out of this study were rather ambiguous and demonstrate how difficult it is to quantify the determinants of demand for sporting events.

The rest of this paper is organized as follows: first, there is a review of previous research and literature that has attempted to quantify the relationship between different variables and demand for attendance at sporting events. Next, a section describes the methodology of this study along with explanations for why certain variables were chosen for inclusion in the analysis. This section primarily discusses variables that have been found to have a measurable impact on attendance in previous research. Following this discussion, the results of this study are discussed, along with a comparison to the results of research that is similar in nature. Finally, a conclusion addresses the central nature of this study and further explains the implications of the relationship between the state of the economy, recession, and attendance at Major League Baseball games.

II. Literature Review

Economic reasoning indicates factors that should theoretically impact the demand for sporting events. Jeffery Borland and Robert MacDonald (2003, p. 481) list some of these factors, which include economic situation, quality of viewing, characteristics of the event, and supply capacity.

Economic situation refers to the cost of attending the game as well as the state of the economy in the area. Cost of attendance is often largely impacted by ticket prices. The state of the economy can be measured by unemployment. Quality of viewing refers to the fan's perceived quality of the event they are paying to view. This is often affected by stadium age and weather conditions, among other factors (Borland & MacDonald, 2003, p. 481). Characteristics of the contest relate to the actual game itself, in particular the probability that a fan's preferred team will win. Finally, supply capacity refers to the

supply of the event that is available to be consumed. This is primarily determined by the capacity of the stadium where the game is being played. When desired attendance outweighs the capacity of the stadium, excess demand is present, and rationing takes place, usually in the form of increased ticket prices. To account for these various factors that may influence a fan's decision to attend the contest, this study included measures of these variables to determine the impact on attendance.

Anecdotal evidence suggests that there may be an inverse relationship between unemployment and attendance at Major League Baseball games. The most recent recession (and subsequent increase in unemployment) started to brew in late 2007, and by the start of the 2009 season it was in full force. Prior to the start of the season, the league warned all teams to expect a rough year for the sport (Brennan, 2009). Predictions were for attendance to be down 17-20% for the entire league, with larger declines possible in areas more deeply impacted by the recession. The true impact of the economic conditions would only be known after the season began.

Through the first half of the 2009 season, one could infer that the economy was greatly influencing attendance at games across the country. Aggregate attendance for the league was down 6.2% compared to the previous year, with some teams experiencing much greater declines (CBS News, 2009). This decrease in attendance happened despite the fact that competitive balance existed among nearly all franchises. At roughly the season's halfway point, only four teams had won at least ten more games than they had lost, and 23 of the league's 30 teams were keeping pace with the league leaders in the season-long race for the playoffs. Conventional wisdom follows that this relatively low

number of superior teams and widespread competitiveness should have bolstered attendance and brought fans to the ballpark.

In addition to the parity present in the first half of the 2009 season, two new stadiums opened in one of the league's largest markets, New York City. The Mets opened up Citi Field, while the Yankees were eager to show off their new $1 billion replacement to the hallowed Yankee Stadium (Forbes, 2008). These new baseball cathedrals, combined with each team's tradition of winning and huge market size, should have brought fans to the ballparks in droves. However, with the slumping economy and each team's ticket prices among the most expensive in the league, fans were unwilling to attend games during the first half of the season (CBS News. 2009). The Yankees were only able to sell out on opening day, generally one of the most sought after tickets for many teams. The Mets did not fare much better, selling out only five of their first 43 games. Even with all the previously mentioned factors working in their favor, these two teams still had trouble filling the seats. Based on this anecdotal evidence, it is reasonable to conjecture that the state of the economy and rising unemployment may have had an impact on the attendance numbers of these franchises and teams located in other areas of the country, as well.

As a starting point, it is useful to consider factors that previous studies have found to impact attendance. In one of the most well-known attendance demand studies, Roger Noll (1974) examined a wide variety of variables on attendance for Major League Baseball franchises. He focused on the two seasons between 1970 and 1971. In his analysis he included team specific variables such as the weighted average ticket price, winning

percentages, and stadium quality, as well as regional qualities such as population and income levels, among others (Noll, 1974, pg. 116-118).

Using regression analysis, Noll found that a number of factors seemed to impact attendance. He found that fan income was negatively correlated with attendance (1974, p. 120), suggesting that individuals with lower incomes preferred to attend baseball games. Noll noted that this was likely due to baseball being a cheaper form of entertainment when compared to alternatives (1974, p. 122). Additionally, he found that past success, in terms of a franchise winning a pennant or championship, had a significantly positive impact on attendance in the following seasons. This relationship seemed to hold even if the franchise remained only marginally competitive going forward (1974, p. 123). Noll also argued that stadium age and quality seemed to have a significant impact on attendance. Newer stadiums often caused attendance to spike initially, upon which attendance slowly declined to normal levels in the following seasons (1974, p. 124). In addition to describing these factors that may impact attendance, Noll also speculated on which cities might be good expansion opportunities for Major League Baseball in the future.

Although Noll's study pointed out numerous factors that appeared to impact attendance, his research has met some criticism in recent times. For instance, the sample set he used in his analysis was rather small, as it included only data from two full seasons. Due to this small sample size, it has been argued that his analysis may be flawed and that the conclusions generated based on his data may not be applicable to the entire population (Dauber, 2009, p. 7). Despite this and other criticisms, his analysis on potential league expansion sites was relatively accurate, and six different cities he pinpointed as targets

have gained baseball franchises since his research (Noll, 1974, p. 130). In any event, Noll's study was extremely important because it laid the groundwork for future studies and uncovered several factors that may have a significant impact on attendance.

Using similar techniques as employed in the Noll study, a 2004 study by Dennis Coates and Thane Harrison attempted to determine the impact of baseball work stoppages on fan attendance. Similar to Noll, Coates and Harrison used regression analysis in order to evaluate the relationships between attendance and other relevant variables. Among the variables included in the study were weighted average ticket prices, number of superstar players per team, winning percentage from the current and previous year, and team age, along with a dummy variable to code years that had labor disputes and the years that immediately followed such disputes (Coates & Harrison, 2004, p. 23). Unlike Noll, though, this study covered a much longer timeframe, ranging from 1969 to 1996 (2004, p. 3).

Coates and Harrison noted that eight different conflicts have developed since the 1960s in the relations between the Major League players and owners, three of which resulted in cancelled games (2004, p. 4). Similar studies on the impact of these conflicts had been conducted before their research, but nearly all concluded that the effects of the strike did not impact attendance in the following years. In the end, this study found that while nearly all strikes have their differences, the effects on attendance of each seem to be fairly consistent (2004, p. 5). Like earlier studies, they found that strikes resulting in lost games had a substantial negative impact on attendance in the strike year (2004, p. 16). Naturally this makes sense, because fewer games results in fewer opportunities for fans to attend games. Additionally, fans may become disgruntled with the athletes and owners in

their conflict and may choose to stay away from the ballpark. However, unlike previous studies they found that labor disputes that resulted in no lost games also negatively impacted attendance in the season following the labor conflict (2004, p. 21).

The findings from Coates and Harrison provided some worthwhile variables to include in my regressions to test the impact of unemployment on attendance. For instance, they found that stadium age is generally a statistically significant and negative determinant of attendance. They also found that if a franchise is successful and wins its fair share of games, then fan attendance will generally increase (2004, p. 16). These findings were consistent with Noll's findings and, due to the longer span of time used in this study, Coates and Harrison further validated some of Noll's results. Based on these findings, I included similar variables in this study to examine the effects of unemployment on attendance. It is extremely important to consider all factors that influence attendance, because the omission of relevant variables could lead to a misleading value on the unemployment coefficient.

An April 2009 sports economics study by Joanna Dauber examined the overall relationship between the state of the economy and professional sports (Dauber, 2009, p. 1). Her analysis included the attendance numbers for all teams in Major League Baseball as the dependent variable, covering every season between 1951 and 2008 (2009, p. 4). As with the Noll and Coates/Harrison studies, she used regression analysis and included numerous variables in order to determine whether or not they impacted attendance (2009, p. 18). Among the variables included in her regressions were economic indicators such as unemployment rates, housing statistics, and gross domestic product (GDP), as well as other

variables including ticket prices, winning percentages, weather conditions, and number of other professional sports team in the area (2009, pg. 35-36).

Using the results from the regressions, Dauber found that that attendance was consistently impacted by the economic variables. She found that attendance was negatively impacted by national unemployment (2009, p. 25) and positively impacted by state unemployment (2009, p. 26). National housing starts were found to have a negative relationship with attendance, and regional housing starts were found to have a positive impact on attendance. Finally, Dauber also found a negative relationship between GDP and attendance. Although the coefficients on national and regional variables measuring economic activity had opposite signs, her results showed that a number of economic variables appear to have a statistically significant impact on attendance. This begins to wear away at the previously wide-held claim that professional sports were recession-proof.

Although Dauber's study contained a wide variety of variables that were found to be significant determinants of attendance in previous studies, some of her findings seemed to contradict economic theory. For instance, she found a negative relationship between GDP and attendance. This seems to contradict conventional wisdom, as one would expect that the relationship would be positive since an increase in GDP would raise income, which should increase ticket sales. This implies that baseball attendance is an inferior good, which is consistent with Noll's results. Dauber also found a positive relationship between ticket prices and attendance (2009, p. 28). This finding did not mesh with prior research, and one possibility for this finding could be explained by the inconsistency of the ticket price series over the interval she studied. Although her ticket price data went back to

1951, there is no single data set that computes tickets prices in the same way for this entire interval. The ticket prices from 1951-1985 are a simple average, whereas the ticket prices from 1986-1988 and 1991-2008 are computed as a weighted average (2009, p. 16). This difference in measurement could partly explain why a positive relationship between attendance and ticket prices was found in this study.

In addition to using different ticket series data sets in her analysis, when Dauber analyzed the relationship between unemployment and attendance she chose to use annual numbers (2009, p. 18). Unemployment data is available on a monthly basis, so by comparing the data sets on an annual basis the fluctuations that occur on a month to month basis are not captured, giving the researcher only a portion of the story. Despite the potential shortfalls of the study, Dauber had found some evidence that attendance at Major League Baseball games may be impacted unemployment and measures of economic activity.

III. Methodology

The primary goal of this study was to determine the impact of unemployment on attendance at Major League Baseball games. Specifically, my data ranged from 2000 to 2009, giving observations from ten consecutive baseball seasons. This timeframe was selected for two reasons. First, by using the most recent data possible we ensure that the conclusions we generate are still applicable. Second, this timeframe is long enough to provide meaningful results while at the same time avoiding the problems associated with the ticket price series (as described in the Dauber study).

This study differed from previous research in two main areas. First, previous studies have often gathered data for all Major League teams and included all the teams in a single regression. While this process gives the researcher more observations in the analysis, it assumes the sign of the coefficients and the significance of the various relationships are constant across all teams. For this study, separate regressions for every team were run, and as can be seen later, the relationships between attendance and other factors (such as unemployment and on-field success) vary substantially among teams. Second, previous studies have often used annual data in their regressions. Since unemployment data is available on a monthly basis, regressions were done using this monthly data in order to capture the short-term variations in the data sets.

Since monthly unemployment data was chosen for inclusion in this study's analysis, attendance for each Major League team was also calculated on a monthly basis. Once these variables were compiled, along with other variables described in the following paragraphs, statistical analysis was performed using OLS regressions with attendance as the dependent variable. The strength of the relationships was tested at the 95% confidence level, which requires a t-statistic of 1.96 or higher in order to be statistically significant (the t stands for a probability distribution which is frequently appropriate for statistical hypothesis testing). In addition to finding the significance of a particular variable, the sign of the relationship was also noted. For purposes of this study, the hypothesis would be supported if the t-statistic of the unemployment coefficient was –1.96 or lower, indicating that there was a statistically significant negative relationship between the unemployment rate and attendance at the 5% significance level.

Data regarding Major League Baseball game attendance was obtained from Baseball-Reference.com. Attendance was compiled for each team at every game between the 2000 and 2009 seasons, upon which the team's home games were separated out so a monthly average could be calculated. Computing attendance data in this way was important for a number of reasons. First, because of differences in stadium capacity across the league, a simple average of attendance at all the games teams played in a given month would not give an accurate depiction of the relationships being studied. Major League ballparks range from capacities of 37,000 to 52,000, making it extremely important to exercise caution when looking at raw attendance numbers. If attendance at road games would have been included, a team's attendance numbers would have been skewed depending on what teams they played and thus, the stadiums they played in. If a team like the Colorado Rockies, whose home field can accommodate 50,000 fans, played road games against teams that had smaller ballparks in a particular month, we would find that the cumulative average attendance would not be useful for us to generate conclusions.

In addition to these differences in stadium capacity, the number of home and away games a given team plays varies on a month to month basis. A team could have a month where they play as little as 6 or 7 home games, and the following month they may play 20 home games. This is simply due to the nature of scheduling and the randomness associated with it. Hypothetically, a smaller number of home games in a particular month could cause a temporary increase in demand, which could potentially skew attendance numbers. For the above two reasons, the attendance variable in this study was calculated as the average home attendance for each franchise in a given month.

The unemployment rate was gathered on a monthly basis for the major metropolitan areas of the 28 Major League teams included in this study (there are 30 MLB franchises in total, including two in Canada that were left out of the analysis). Compiling data for each team's metropolitan area was done for one main reason, fan loyalty. The amount of fan interest in a franchise is generally based on emotional or geographic connection (Borland & MacDonald, 2003, p. 479), so it makes sense that data would be gathered for the major city or metropolitan area of each franchise. Unemployment rates were compiled for the months April through September, which corresponds with the time of year when the baseball season typically runs. The data was obtained from the Bureau of Labor statistics, and the figures were not seasonally adjusted because a seasonally adjusted data set was unavailable.

The unemployment rate was chosen as the independent variable of focus in this analysis for a number of reasons. First, during recessions or other downturns in the economy, the unemployment rate consistently rises above the base line rate (Musunuru, 2008). This can easily be seen by plotting unemployment rates on a graph and superimposing the various recessions on top. Furthermore, when unemployment rises, household income falls because individuals are out of work. When income decreases, households must cut back, and often the first activity cut out of the budget is recreation and entertainment. For these reasons, the unemployment rate is a good indicator of a region's economic climate, and I believe it is worthwhile to explore its impact on attendance at MLB games.

In addition to the regional unemployment rate, a number of other variables were compiled that may have an impact on attendance. Prior research and economic theory suggests a negative relationship between ticket prices and attendance at sporting events. To account for this connection, two different price measures were included in the regressions, and each variable was transformed from nominal to real terms using the personal consumption expenditures deflator. First, the average ticket price for each team was compiled over the years included in this study. This data was compiled from the Team Marketing Report, a firm that specializes in sports marketing research. Because teams charge different prices for different quality seats (in terms of viewing, closeness to the playing field, etc.), the average ticket price is computed as a weighted average. This is important because a simple average of all the various price ranges does not give an accurate estimate of the average cost per seat. Stadiums generally have a small number of luxury seats that are expensive and a large number of seats that are comparatively much cheaper, catering to all income levels of fans. The number of seats included in each price range is not equal, so a simple average would tend to overstate the ticket price. Thus, a weighted average ticket price provides a much more accurate measure of the average cost of getting through the stadium gate.

Ticket prices measure the cost of admission, but the ticket price is only one cost associated with attending a baseball game. In addition to parking, fans often incur other expenses at the ballpark, namely souvenirs and food. Because of this, it is important to include a variable that estimates the true cost of attending the sporting event. For this component, I gathered a variable called the Fan Cost Index for each team. As with the average ticket price series, this data is compiled by the Team Marketing Report. Included

in its calculation are the prices of parking, four tickets, four small soft drinks, two small beers, four hot dogs, two programs, and two caps (Fan Cost Index). Although this data set is probably not indicative of the exact costs that many fans incur when attending a ballgame, it does have some value in that it is safe to assume the normal family or fan will buy more than just tickets in a trip to the ballpark. Thus, including expenses such as these should provide a more comprehensive measure of the cost of attendance than ticket prices alone.

Previous research also suggests that attendance is also influenced by the quality of team and their on-field success. For purposes of this study, this was accounted for by calculating each team's win percentage for each month. Win percentage is a widely used calculation in the sporting world, and it is defined as the number of wins divided by number of games played. This data serves as a reasonable measure of team success because as teams win more games, their winning percentage increases. As it relates to the regressions, one could argue that fans do not base their decisions on whether to go to the ballpark or not based on the current month's winning percentage, mainly because this number is unknown until the end of the month. To account for this, each team's winning percentage from the previous season was also included in the regressions. This inclusion is valid because fans often base their expectations about the future prospects for their sports team on the recent past, as stated in the studies by Noll and Coates/Harrison in their research. By this logic, success in the previous season should increase fan optimism in the following season, stimulating ticket sales.

A final variable included in my regressions related to the characteristics of the stadium each team played in. Prior research has concluded that the age of a team's stadium generally had a significant negative impact on attendance. To account for this, the age of the stadium of each MLB stadium was included in the regressions. Additionally, the capacity of each stadium was included to determine whether or not each franchise typically experienced sellouts or if they often had a large number of empty seats.

IV. Results

In conducting this research, I expected to find a variety of results. One main expectation was that I believed I would find a negative relationship between unemployment and attendance for several MLB franchises. In addition, each franchise in the study had its own set of unique characteristics, so I expected the effects of unemployment to vary by franchise.

In addition to finding a significant impact from unemployment, I expected to find that other factors played a role in fan attendance, as well. For instance, I expected to find a negative relationship between ticket prices and attendance for most teams. I also anticipated finding a positive relationship between the on-field success and attendance. If a franchise was able to put a better product on the playing field, more people would be willing to pay admission to take part in the success. However, as with the economy, I expected differences in the magnitude for response to these variables across franchises. Despite predicting that other variables would be found to impact attendance, I believed that this study would conclude that unemployment was one of the biggest determinants of fan attendance.

Prior to performing regressions with the data sets, correlations were run between each team's average monthly home attendance and the unemployment rate of the team's metropolitan area. The results of this preliminary analysis were quite ambiguous, as the relationships greatly varied in their direction and strength among teams (see Attachment 1 for a graphical representation of the relationships). Of these twenty-eight relationships generated, fourteen were found to be significant, with eight of these significant relationships being negative. The cities found to have teams with relationships supporting the hypothesis of this study included Atlanta, Baltimore, Cincinnati, Dallas, Denver, Houston, San Diego, and San Francisco. Cities found to have teams with positive correlations between unemployment and attendance included Boston, Kansas City, Milwaukee, Minneapolis/St. Paul, Philadelphia, and Tampa. Although this analysis did not include any other variables than unemployment, it seemed to suggest that unemployment may have a significant impact on attendance for a large number of teams. However, when other variables were included in the following regression analysis, a large number of these relationships between unemployment and attendance deteriorated.

The results of the regressions generally found unemployment was not a significant determinant of attendance and demonstrated how difficult demand for attendance is to explain. All told, after running the regressions we discovered that unemployment has a statistically significant and negative coefficient for only three teams. Surprisingly, the coefficient on unemployment was statistically significant and positive for three other teams. This low number of significant relationships suggests that attendance is relatively unaffected by unemployment for the majority of Major League Baseball franchises. Among the teams found to have negative relationships between attendance and unemployment

were the Detroit Tigers, Chicago White Sox, and San Diego Padres (see Attachments 3, 4, and 5). Even though the overall number of significant relationships was relatively low, the regressions showed that unemployment may be a statistically significant determinant of attendance for at least a few franchises.

By looking at the data, it was not surprising to find that unemployment in Detroit negatively impacted attendance at baseball games. Since the beginning of the most recent economic downturn, this area of the country has been one of the hardest-hit regions of the United States, particularly due to the area's high dependence on the auto industry. In fact, unemployment increased rapidly from 8.3% in April 2008 to 17.7% in September 2009. As one would expect, over the same timeframe the attendance numbers for the Detroit Tigers dropped off dramatically. The Tigers drew 1.38 million fans for the 2008 season, while they were only able to bring 1.15 million fans to the ballpark in 2009, representing a 16.4% decrease over only one season. This decrease was not due to poor on-field performance, as the Tigers came within one game of making the playoffs in 2009, compared to finishing 14.5 games back of a playoff berth in 2008. This illustrates that although the Tigers put a superior team on the field in 2009 when compared to 2008, the dramatic increase in unemployment was likely a significant factor that forced many fans to stay away from the ballpark.

Much like Detroit, San Diego has also been deeply affected by the most recent recession. Since April 2008, the region's unemployment rate climbed from 4.9% to 10.4% by September 2009. As happened in Detroit, attendance over the same timeframe decreased dramatically for the region's MLB team, the San Diego Padres. The Padres were

able to draw 2.4 million fans during the 2008 season and only 1.9 million during 2009, representing a nearly 21% decrease. One other factor that may have contributed to this decline is the Padres' lack of competitiveness in 2009. In contrast to Detroit, the Padres were never really in contention for much of the 2009 season, despite winning 12 more games compared to 2008. In addition to being out of the playoff race much of the season, another factor that may have contributed to the decrease in attendance is the team's rapid decrease in payroll. Between the 2001 and 2008 seasons, the Padres had gradually begun to spend more money on their roster in order to acquire and hang on to top talent. Over this period, the total payroll increased at a 9.5% rate each year, rising from $38.9 million to $73.7 million. However, in 2009 the team underwent a massive payroll cut, shrinking the team's total payroll to $43.7 million. This choice by team management likely angered and alienated the fans, and when combined with a rising unemployment environment, we see some possible explanations regarding why attendance for the Padres fell off in 2009.

In addition to the Tigers and Padres, the Chicago White Sox were found to have a negative relationship between unemployment and attendance. From April 2008 to September 2009, unemployment in Chicago increased from 5.4% to 10.0% and total attendance at White Sox games decreased from 2.5 million to 2.3 million. In addition to the regressions finding this relationship, it is worthwhile to note that the Chicago Cubs, the other Major League franchise in the Windy City, were found to have a statistically insignificant relationship between attendance and unemployment. The difference likely results from factors unique to the two franchises. The Cubs are located on the north side of town, whereas the White Sox are located on the south side, which is perceived as the less desirable location. Additionally, the Cubs are known for their extremely large, national fan

base. These two factors could partly explain why the Cubs seem to be relatively unaffected by unemployment, while their south-side counterparts are more greatly impacted by the economy.

As mentioned earlier, the regressions found three baseball teams that had statistically significant and positive relationships between unemployment and attendance, including the Tampa Bay Rays, Baltimore Orioles, and Pittsburgh Pirates. For at least one of these teams (the Rays) the relationship may be impacted by factors not included in this study. The Rays came into Major League Baseball beginning in the 1998 season via expansion. Over the first ten seasons the team experienced very little success, winning a franchise-best 70 games in 2004 (out of 162 total games played). That all changed in 2008, when the Rays came seemingly out of nowhere to win 97 games and earn a trip to the World Series. Coupled with this success, attendance skyrocketed from 1.4 million fans in 2007 to 1.8 million in 2008, a 23% increase. At the same time as this rapid increase in fan interest, unemployment in the Tampa/St. Petersburg region was on the rise due to the struggling economy. When the regressions were run, the rapid increase in attendance was likely attributed to this increase in unemployment. However, when looking at the other factors in play, we see that this increase in attendance was likely caused by the Rays' on-field success and it was merely coincidental that unemployment happened to be increasing during the same timeframe.

It may be that smaller increases in unemployment than those experienced in Detroit, Chicago, and San Diego lead to an increase in attendance. Although individuals have less income to spend on leisure activities when unemployed, they also have more free

time on their hands. Depending on their economic situation, they may choose to use up this additional free time by taking part in more leisure activities, such as going to the movies, working out at the gym, or by attending a baseball game, especially games played during the day on weekdays. Compared to other forms of entertainment, baseball tickets are relatively inexpensive, and if an individual chooses to sit in the "nose-bleed" sections of the stadium, seats are often available for around $10 for most MLB teams.

In addition to being a relatively cheap form of entertainment during a period of increased leisure time, a baseball game can provide an escape for the unemployed individual during a rough patch. Instead of being constantly bombarded with thoughts and concerns about finding a job, a baseball game can provide a relaxed atmosphere and a much needed diversion from the stress of the situation. It is these intangible benefits that baseball games provide that I believe are at play when the relationship between unemployment and attendance is positive. These considerations of the broader effects of unemployment may explain why an increase in unemployment is associated with rising attendance in Baltimore and Pittsburgh and why the coefficient on unemployment is not statistically different from zero for most teams in the regressions.

Although the regressions found few statistically significant relationships between unemployment and attendance, a number of other variables included in this study had significant relationships with attendance for a number of teams. For instance, the relationship between a team's winning percentage from the previous season and attendance in the current season was positive and statistically significant for twelve different teams and negative for none. This finding was consistent with previous studies,

and when the relationship is evaluated intuitively it makes sense why this relationship would show up quite often. It is human nature to be competitive and, when given the choice, individuals will choose success over failure. Applying this concept to sports, fans prefer to watch games played by skillful players, and they prefer their team to win instead of lose. Given this intuition, it is no surprise that success in the previous season leads to increased attendance in the following season. If a team is competitive and experiences on-field success the year before, it is reasonable for fans to assume they will perform similarly in the future. The high number of significant relationships found in this study gives backing to this theory, and it appears that attendance is impacted by recent success on the playing field for a number of teams.

The age of a team's stadium was also consistently a significant determinant of attendance. However, unlike the relationships found in regards to the previous season's win percentage, the sign on the variable was not consistent across teams. The regressions found eighteen statistically significant relationships among the twenty-eight Major League teams studied. Of these relationships, seven were positive and eleven were negative. Previous studies have shown that stadium age often has a negative impact on attendance, and the eleven negative relationships found in this study give support to these findings. Intuitively, this relationship seems to make sense. As stadiums age, the novelty of the facility begins to erode away and fans are not as excited to attend games there. Although this logic seems to hold for the majority of teams, this study found that this reasoning may not apply to all Major League Baseball franchises.

Along with finding eleven negative relationships between stadium age and attendance, the regressions found seven teams that had positive relationships between the variables. Although this does not mesh with what common sense would tell us, there are a few reasons why this may be the case. For example, two of the teams found to have positive relationships are the Boston Red Sox and the New York Yankees. The home ballpark of the Red Sox, Fenway Park, opened in 1912 and has served as the franchise's stadium since that time. Likewise, Yankee Stadium opened in 1923 and served as the home of the Yankees until construction of New Yankee Stadium was completed prior to the 2009 season. In both instances, these stadiums have been iconic parts of the game for decades, and sports fans around the country have included one or both of these on their lists of must-see venues.

A number of theories could explain why these positive relationships were found between stadium age and attendance in the regressions. One possible explanation is that fans come to appreciate a classic stadium more and more as it ages. Because of the rich history of the ballpark, many fans want to experience a game at the stadium firsthand to say that they have been there. Additionally, as in the case of Yankee Stadium, attendance may continue to increase during a stadium's later years if it is expected to close in the near future. Baseball fans knew that Yankee Stadium was scheduled to host its last season in 2008, and fans realized that if they wanted to take in a ballgame at the venue they would have to do it soon. Lastly, gradual increases in stadium capacity may have an impact on the relationship between stadium age and attendance. For example, Fenway Park has undergone numerous renovations during the past ten seasons, expanding its capacity from 33,993 in 2001 to 37,400 in 2008. Because Boston is one of the largest markets in Major

League Baseball, sellouts at Fenway Park are a normal occurrence. As the capacity of the stadium increases, attendance increases as well due to the high ticket demand. When coupled with an increasing stadium age, a positive relationship is likely to show up in the regressions. When looking at special cases such as Yankee Stadium and Fenway Park we see that positive relationships may exist between stadium age and attendance, but the relationship is consistently negative for most other franchises.

The other variables included in this study were each significant for only a small number of franchises. In regards to ticket prices, eight statistically significant relationships with attendance showed up in the regressions. Five of these relationships were positive and three were negative. Two of these eight relationships (the Tigers and Pirates) also had significant relationships in regards to attendance and unemployment. However, the Tigers were found to have a positive relationship with ticket prices and the Pirates had a negative relationship. This seems to contrast with what the unemployment relationships tell us, as the Tigers had a negative relationship with unemployment and the Pirates a positive one.

Some other variables were generally found to have insignificant coefficients across teams. As much as the previous season's win percentage showed up as a significant determinant of attendance, the win percentage from the current month showed up only once in the regressions, a positive relationship for the Tigers. Similarly, an appearance in the previous season's playoffs was found to be a significant factor on attendance in only seven instances. Three of these relationships were positive, and again the Tigers were included among the teams. These results from the "on-field success" category suggest that

success in the previous season in terms of winning percentage is generally the most significant determinant of attendance for many teams.

V. Conclusions

This study found only a small number of statistically significant relationships between unemployment and attendance, so we can only weakly conclude that unemployment may be a significant determinant of attendance in these few instances. Attendance for the Detroit Tigers dropped off substantially in 2009, and since the state of the economy greatly impacted this region it is reasonable to conclude that unemployment was a contributing factor in the decrease. As we saw with the Padres, unemployment may be a significant determinant of attendance, and when coupled with other potential factors such as a decrease in payroll the negative effects are compounded. Additionally, by finding a small number of teams with positive relationships between unemployment and attendance, this study suggests that small increases in unemployment may have a positive impact on attendance. This could possibly be due to baseball being a relatively cheap form of entertainment and fans' increased leisure time when unemployed.

Despite finding a handful of statistically significant relationships between unemployment and attendance in this study, the results suggests that Major League Baseball attendance is relatively unaffected by unemployment except for a few special cases. This has a number of implications for upper management of teams found to have insignificant relationships and suggests that the majority of baseball is immune to fluctuations in unemployment. Consequently, many teams should continue to enjoy stable attendance no matter the economic climate. This is a valuable insight because teams can

choose to forego additional advertising to stimulate demand during tough times and instead use funds to try and retain or acquire top talent. By using funds to put a better product on the field, it should translate into a higher amount of wins, which was found to have a greater impact on attendance compared to unemployment based on the results from this study. This logic suggests that that attendance is something that is largely within control of management based upon the decisions they make.

Another finding of this study was that the factors that impact attendance for each franchise are unique when compared with other franchises. Teams like the Padres appear to be greatly impacted by unemployment, and conversely their attendance numbers appear to be unaffected by other factors such as the previous season's win percentage. For other franchises, the factors that significantly impact attendance appear to be all over the board and there are few consistencies among teams, even those located in the same city.

Based on the results of this study, there are a few suggestions for future research in this topic area that may help to yield better results. For instance, the time span of this study was relatively short, producing observations from ten Major League seasons. If the scope of the study was increased to a longer time period and more observations were able to be obtained, we may find that more relationships exist between attendance, unemployment, and other variables.

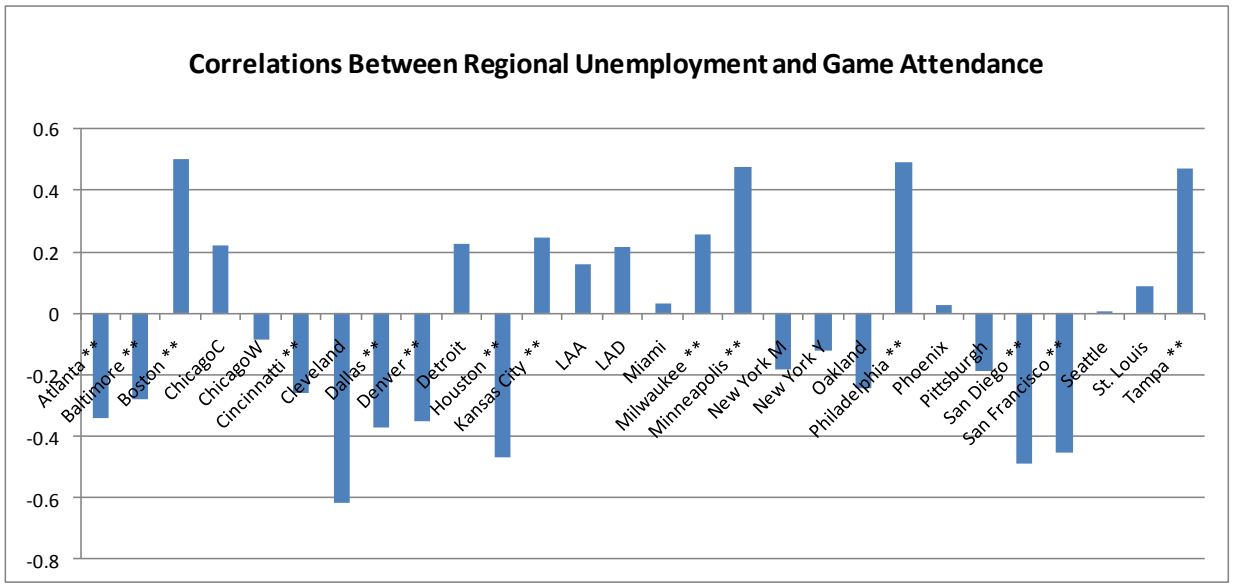
Future research should also include larger, more comprehensive set of variables to include in the regressions with attendance. Including additional variables would be valuable and may help to explain how attendance is impacted by other factors omitted from this study. For instance, other data sets that have been included in previous studies

include weather conditions, number of star players on the roster, and if the game was played on a weekday or weekend. Inclusion of these variables in future analyses may provide greater explanatory power for the researcher.

Finally, future research in this field should attempt to jointly estimate attendance and ticket prices. This is difficult to accomplish in this study due to its relatively short sample size. In addition to this, ticket prices are often set at the beginning of the season and remain unchanged for the year, giving us only one observation of ticket prices per year for each team. If ticket prices and attendance could be jointly estimated by increasing the sample size, the conclusions that are generated from the analysis could be more meaningful.

As explained earlier, this study finds that unemployment and attendance are unrelated for the vast majority of Major League Baseball franchises. This leads the casual observer to conclude that baseball games will continue to draw fans even when unemployment and economic conditions are unfavorable. Despite this determination, one only has to look at attendance numbers for all of Major League Baseball over the 2000 to 2009 seasons to see that unemployment and the economy may have a larger impact on attendance than we can conclude from this study. Attendance for Major League Baseball experienced a decrease compared to the previous season in five out of the ten years analyzed in this study. The years where this occurred included the 2001, 2002, 2003, 2008, and 2009 baseball seasons (see Attachment 6). Coincidentally or not, these decreases in attendance exactly correspond with the five periods of increasing unemployment experienced during the decade.

Attachment 1



This graph depicts the correlations between each team's average monthly home attendance and the area's metropolitan unemployment rate. The cities marked with the "**" denote relationships that were found to be significant. As the graph demonstrates, the relationships greatly vary in terms of their direction and strength.

Attachment 2 – Summary of Regression Results

The teams listed below were found to have statistically significant relationships between attendance and the variable studied.

Regional Unemployment
Positive (3) – Baltimore Orioles, Tampa Bay Rays, Pittsburgh Pirates
Negative (3) – Detroit Tigers, Chicago White Sox, San Diego Padres

Ticket Prices
Positive (5) – Detroit Tigers, Los Angeles Angels of Anaheim, New York Mets, San Francisco Giants, Colorado Rockies
Negative (3) – Texas Rangers, Pittsburgh Pirates, Arizona Diamondbacks

Previous Season's Win Percentage
Positive (12) – Minnesota Twins, Cleveland Indians, Tampa Bay Rays, Texas Rangers, Seattle Mariners, Oakland A's, New York Mets, Milwaukee Brewers, Cincinnati Reds, Pittsburgh Pirates, San Francisco Giants, Colorado Rockies
Negative (0)

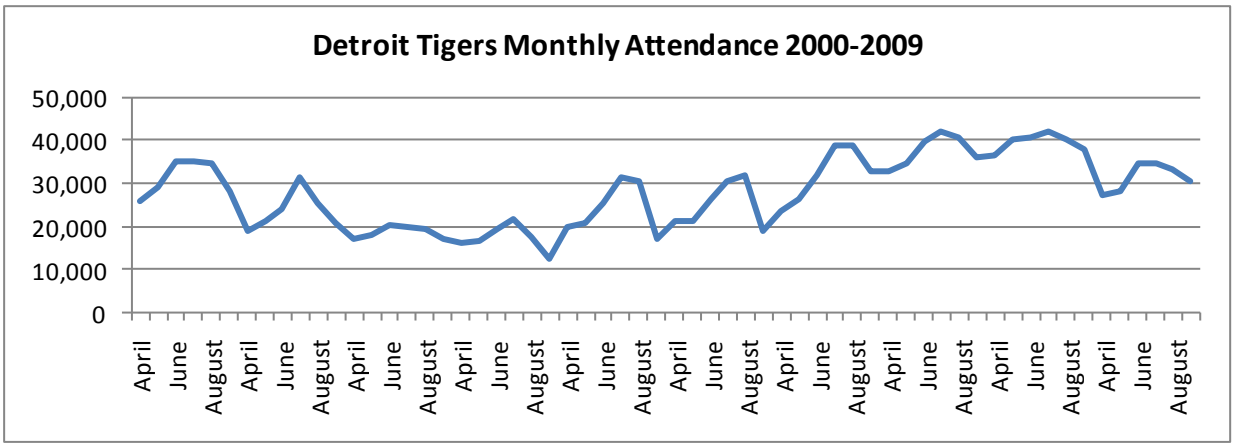
Current Month's Win Percentage
Positive (1) – Detroit Tigers
Negative (0)

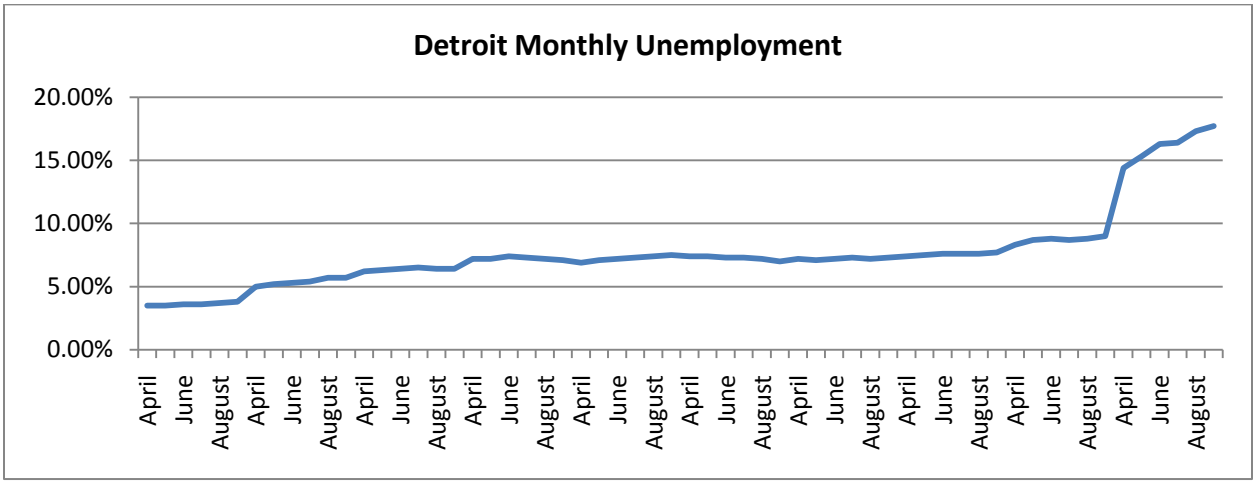
Previous Month's Win Percentage
Positive (2) – Florida Marlins, Colorado Rockies
Negative (0)

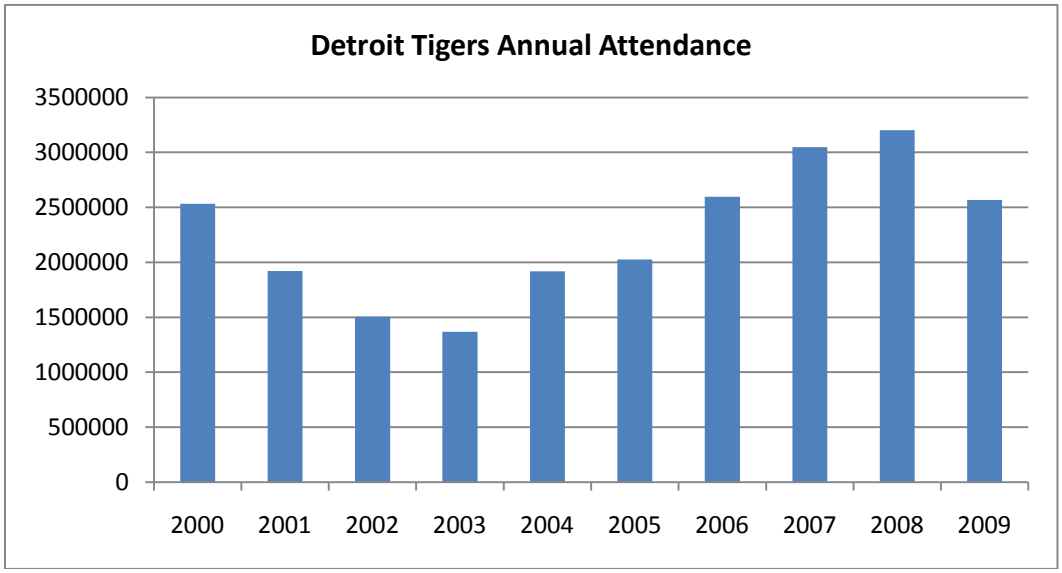
Stadium Age
Positive (7) – Detroit Tigers, Chicago White Sox, New York Yankees, Boston Red Sox, New York Mets, Chicago Cubs, Los Angeles Dodgers
Negative (11) – Cleveland Indians, Baltimore Orioles, Texas Rangers, Seattle Mariners, Atlanta Braves, St. Louis Cardinals, Milwaukee Brewers, Pittsburgh Pirates, San Francisco Giants, San Diego Padres, Arizona Diamondbacks

Playoff Appearance in Previous Season
Positive (3) – Detroit Tigers, Philadelphia Phillies, Arizona Diamondbacks
Negative (4) – New York Yankees, Tampa Bay Rays, New York Mets, Colorado Rockies

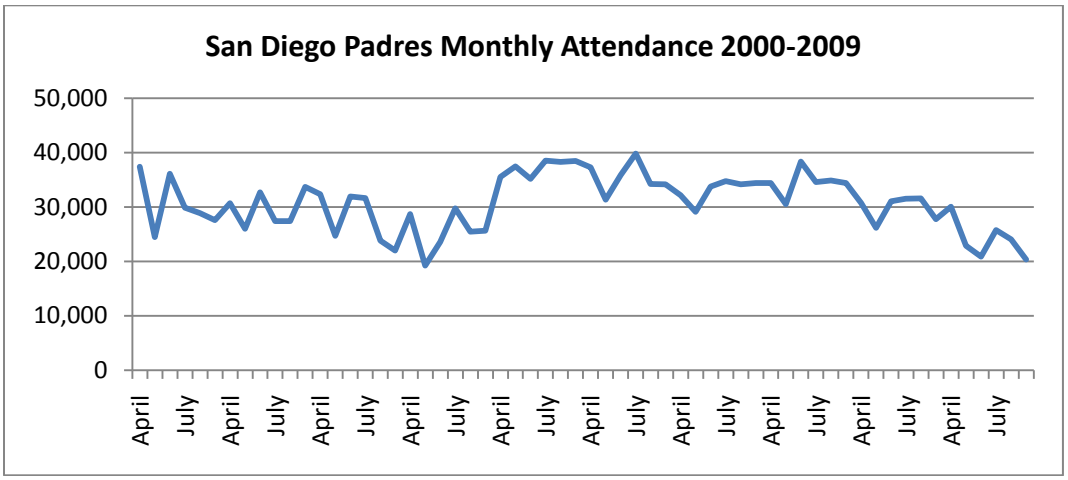
Attachment 3 – Detroit Tigers Attendance and Unemployment Summary

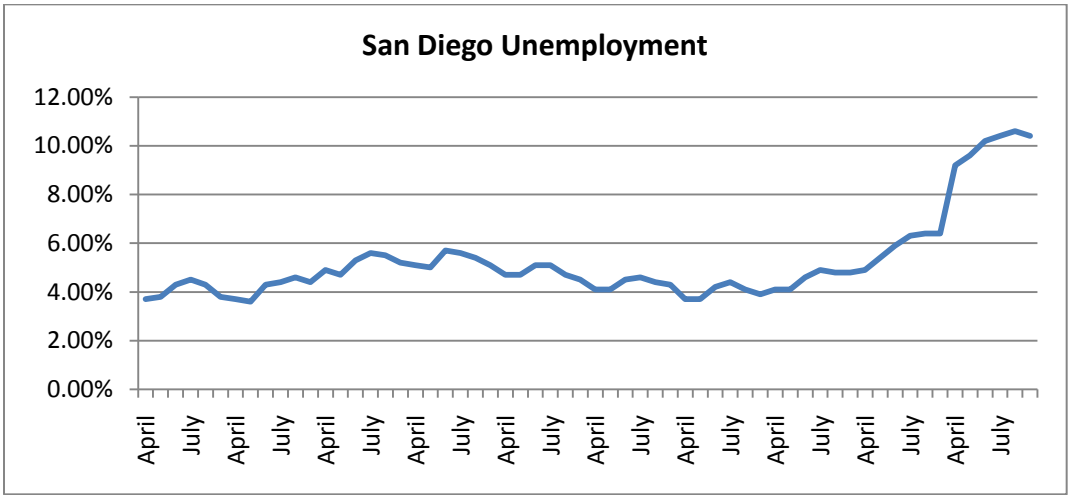


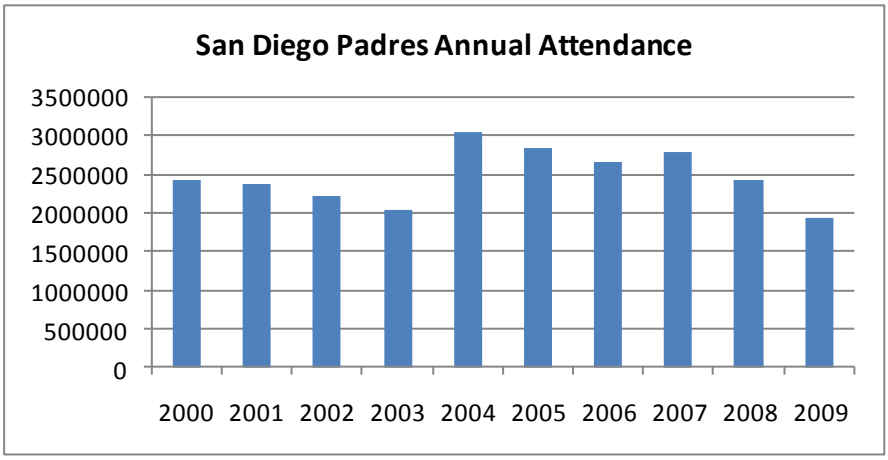




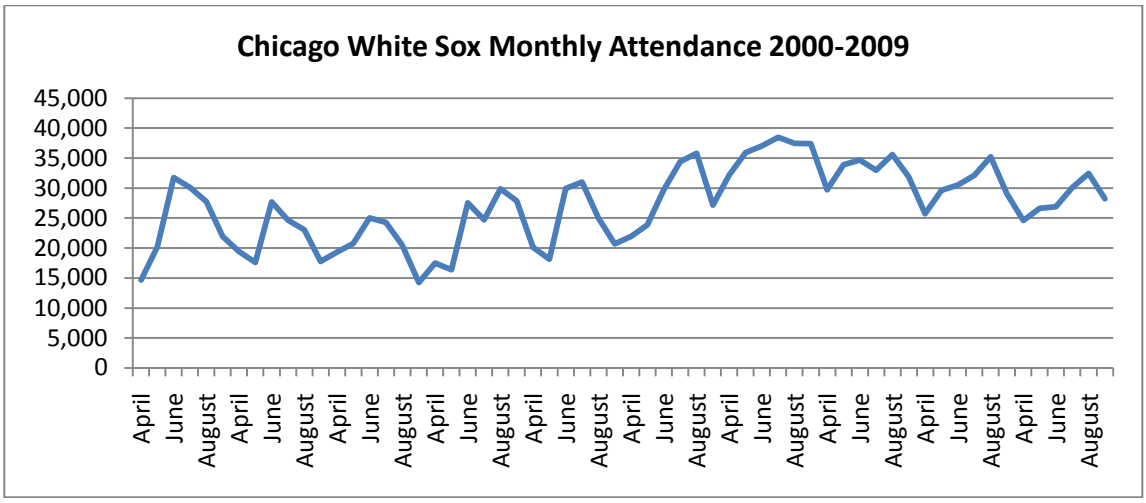
Attachment 4 – San Diego Padres Attendance and Unemployment Summary

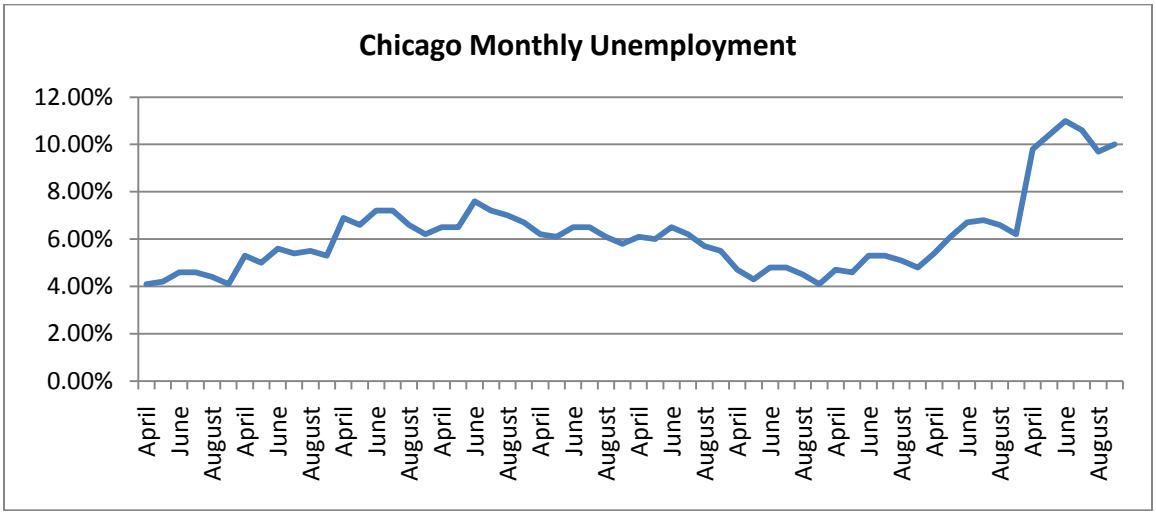


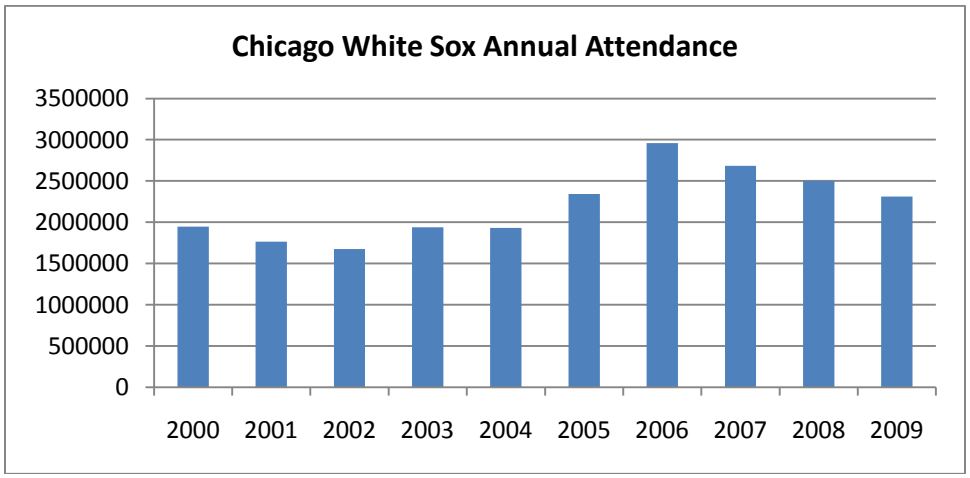




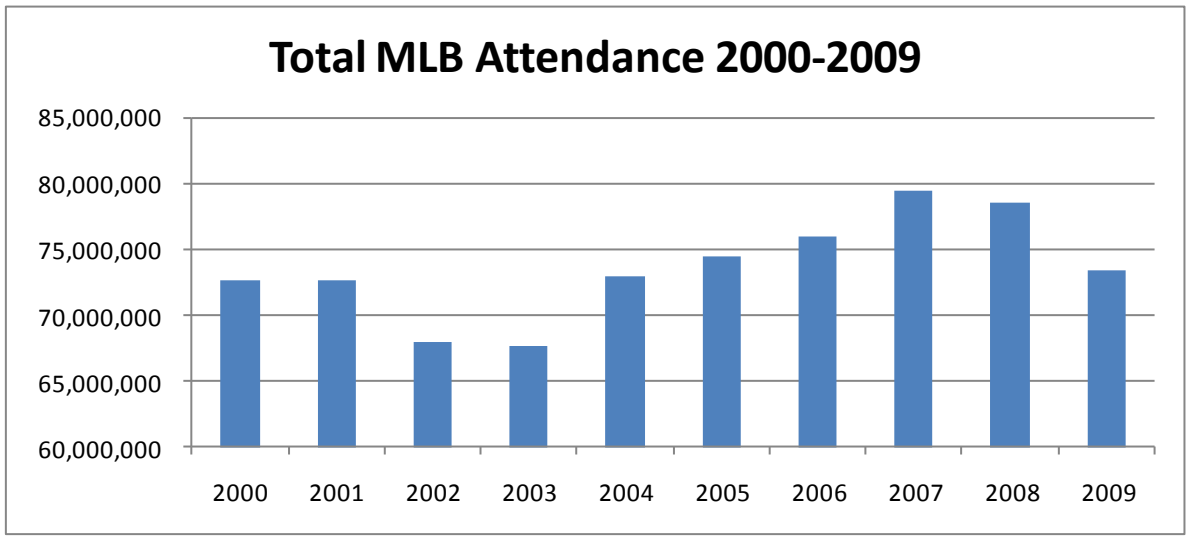
Attachment 5 – Chicago White Sox Attendance and Unemployment Summary

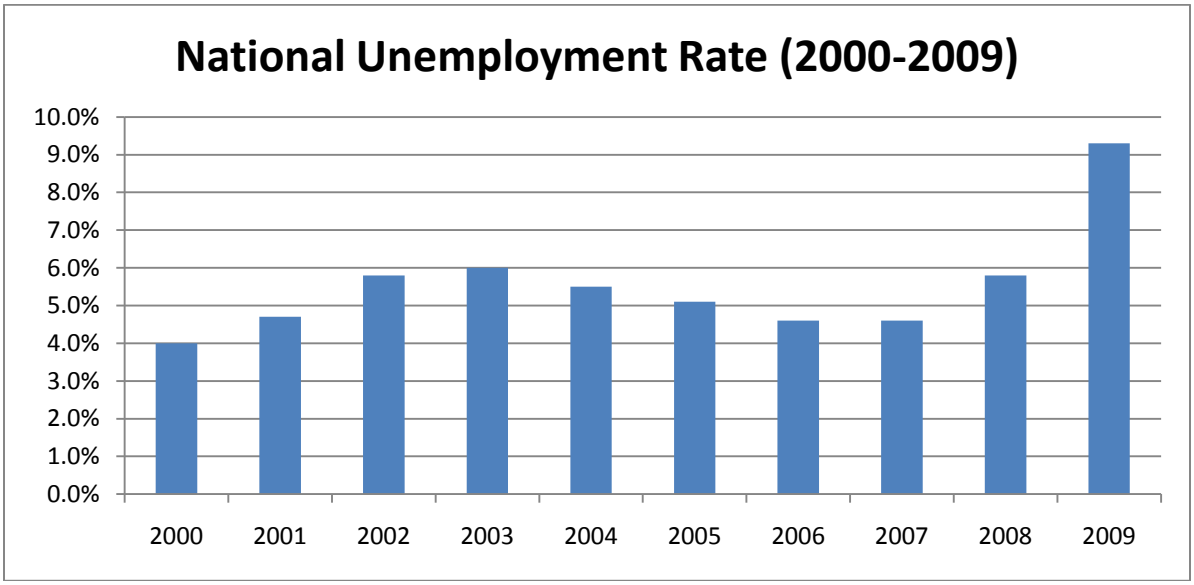






Attachment 6 – Aggregate MLB Attendance vs. the National Unemployment Rate





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