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**THE FALL OF AMERICA'S GAME: HOW ORGANIZATIONAL &
MARKETING FAILURES HAVE LED TO A DECREASE IN MAJOR LEAGUE
BASEBALL'S MARKET SHARE**

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ABSTRACT

This paper focuses on investigating and understanding the decline of Major League Baseball in both market share and consumer interest. Once the most viewed and followed sport in the country, baseball has been steadily declining in popularity, as consumer favor has shifted to sports like football and basketball. To prove this, a database has been created which tracks historical attendance, stadium capacities, winning percentages, payrolls, and metro area populations for all four major North American sports leagues (baseball, hockey, basketball and football) spanning over 20 years. These data show a significantly higher correlation between winning percentage and attendance for Major League Baseball than any other league, and through more complex statistical analysis, displays important consumer tendencies towards different teams and different sports leagues. This report hypothesizes that much of this is due to marketing failures and shortcomings within the organization as a whole, as well as the difficulty in marketing the sport itself on a national scale. By combining the data with matching data about the marketing efforts of the major sports leagues, and their respective implementation of various management policies (e.g. free agency for baseball), the thesis seeks to prove this hypothesis. This thesis will analyze not only the shortcomings of Major League Baseball, but seeks to shed a light on consumer preferences and the changing landscape of the North American professional sports industry.

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INTRODUCTION

Sports have long been a powerful presence in societies across the world. Cultures and countries have adopted different sports as their own, and these sports have woven their way into the fabric of life. For as long as sports have existed within society, they have been important business endeavors as well. In the United States, the convergence of sport and business came about with America's national past time, baseball. Since its founding in 1903, Major League Baseball has dominated the North American professional sports industry. However, until the second half of the 20th century, baseball had no true competition. As the National Basketball Association, the National Football League, and the National Hockey League began to grow into true giants within the professional sports industry, baseball began to falter. In 1967, the first ever National Football League Super Bowl was played. This was accompanied by an era of explosive growth in professional basketball, with star players like Larry Bird, Magic Johnson, and Michael Jordan dominating the game and capturing the nation's attention. This paper seeks to explore why Major League Baseball, even with over half a century's head start, has lost both market share and popularity in the North American professional sports industry to the NBA, NFL, and NHL since the onset of MLB free agency in 1976.

I contest that these competitors were able to take advantage of Major League Baseball's growing number of weaknesses. There are a plethora of potential reasons for the sport's fall from dominance: various social issues, scandals and strikes, sweeping cultural change in the late 20th century, and the emergence of new sports, to name a few. However, the case can be made that part of baseball's decline in the eyes of consumers is a result of mismanagement from inside Major League Baseball itself, as well as how the game is played on the field. MLB has monetized all digital content, the league has been unwilling to implement a salary cap, the regular season has twice as many games as any other sport, and the league is being run by old fashioned purists unwilling to adapt the game to fit the modern era and modern consumer. Until very recently, baseball has been unwilling to face the reality of what these weaknesses have done to the game's popularity. It takes only one statistic to illustrate just how dire baseball's current situation is: the median age of a baseball fan is 57 years old (Lombardo & Broughton, 2017), making it the oldest fan base of all the four major North American sports. Baseball has an aging-out issue, and that issue is only worsening the longer MLB sits on its current business and marketing philosophy. Through an analysis and empirical investigation into the relationships between the policies and practices of MLB, we can better understand where the league has failed, and what they might do to revive a struggling sport.

History of Baseball

In America, no sport has been as important, or as woven into the fabric of the country's history as baseball. Dubbed the "National Pastime", baseball was created in the mid 1800's and has been a staple of American life ever since. The game was played by civil war soldiers, rural farmers, and everyone in between in every city, town, and backyard in America. It was America's game, and when Major League Baseball (referred to as MLB) was officially founded in 1903, its popularity skyrocketed. As America grew, so too did baseball, with franchises and clubs spreading Westward throughout the 20th century. Not only was baseball a sport, but it became an important barometer of social change. In 1946, a man by the name of Jack Roosevelt Robinson became the first African American man to play in Major League Baseball, breaking the color barrier and helping fuel the civil rights movement. Jackie Robinson changed America forever, and baseball was the stage on which he did it. Then, in 1958, Robinson's Brooklyn Dodgers moved to Los Angeles, leaving a fanbase heartbroken and betrayed, the moment that many point to as the beginning of the true business of baseball.

The relocation came as a result of a feud between New York City and the Dodger's owner, real estate businessman Robert O'Malley. O'Malley wanted to build a new stadium for the Dodgers in New York, but the city refused to give him the land. Los Angeles promised O'Malley land on which he could build and own his ballpark, giving him complete access to all of the resulting revenue streams. Teams had relocated into new markets in the past, but the Brooklyn Dodgers were not like other teams, and Brooklyn fans were not like other fans. The team mirrored the blue-collar city, its players the heroes of countless young fans. The betrayal felt by Dodger's fans in 1958 has become all too commonplace in the business of baseball. While the relocation of teams has largely ended, with only one team relocating in the last 48 years, the relocation of the sport's best players is a yearly occurrence.

In 1976, MLB and the MLB Player's Organization signed a new bargaining agreement which introduced free agency into baseball. Free agency occurs when a player reaches the end of contract with their current club. The player is then free to pursue a contract with any other team in the league. Up until 1976, the majority of baseball players signed and played with the same club for the entirety of their careers. This provided the opportunity for fans to form important relationships with players. Building relationships between customers and products is a core principle of marketing, fostering and creating incredible customer loyalty. Relationships between fans and players is one of the structural foundations for any professional sports franchise. A child born in Atlanta in the late 1940's watched Hank Aaron go from a rookie, to one of the greatest players of all time over his sensational 22-year professional career spent entirely with the Atlanta Braves. In those years, a lifelong bond was formed between that fan, Hank Aaron, and the Atlanta Braves. That lifelong bond means lifelong customer value to the Braves as an organization. That lifelong bond means lifetime customer value from this fan's children, grandchildren, and so on. "Fan identification is an important concept because it may minimize the effects of team performance on long term fiscal success and position in the sports entertainment hierarchy" (Sutton & McDonald, 1997:15). That one relationship created three generations of value to the Braves.

When free agency began, players like Hank Aaron didn't stay in the same place. A smaller-market team like the Braves would never have had the money to pay a player of Aaron's caliber what he was worth. They would have been outbid by a team with more money, and those children who idolized the man called Hammerin' Hank would watch their hero suit up in a different uniform the next year. The business of baseball was destroying the very fan relationships that the business was built upon. Big name players were chasing big money, and that trend has only increased in the time since 1976. One of the critical effects of free agency is that baseball is a game increasingly driven by teams rather than players. Although fans are loyal to their teams in their home markets, the lack of star players has made it difficult to market baseball on a national scale.

In 1977, baseball expanded into two new markets, creating the Seattle Mariners and Toronto Blue Jays. Over the next 20 years, 4 more teams were founded, bringing the total number of Major League Baseball teams to its current number of 32. In 1993, the Colorado Rockies began playing in Denver, and the Florida Marlins in Miami. The following year was one of baseball's most challenging and destructive years.

In 1994, the collective bargaining agreement between the MLB Player's Association and the league's owners was set to expire. The owners were demanding the creation of a salary cap to fight rising player salaries, while the players refused to sign any agreement which included a cap. On August 12, 1994, more than halfway through the regular season, the players began a strike lasting 232 days. The strike cancelled the remainder of the season, as well as the 1994 World Series. The strike would not be resolved until April of 1995, with the agreement being signed

lacking a salary cap. The results were devastating for baseball's attendance, with average league attendance falling below 30,000 (per game) for a decade (Shaikin, Los Angeles Times, 2019).

In 1997, MLB enacted the Competitive Balance Tax on team payrolls, a far cry from the salary cap long desired by the owners. The tax is placed on teams whose opening day payrolls exceed \$206 million, and serves as nothing more than a slap on the wrist. In reality, the tax has done nothing to disincentivize spending.

1998 saw the creation of the Phoenix based Arizona Diamondbacks, and the Tampa Bay Rays. Major League Baseball was seeking to expand the game's reach by creating more and more teams, but in reality, this merely diluted existing fan bases. This was also the season in which two of the game's great sluggers chased down the single season home run record. Mark McGwire of the ST. Louis Cardinals and Sammy Sosa of the Chicago Cubs were hitting home runs at breakneck speed, and their chase for Roger Marris's famed record of 61 home runs captivated the nation during the summer months. It seemed that baseball was finally on track to overcome the damage done by the 1994 strike. However, this home run chase became tainted by the underlying popularity of steroid usage in baseball. From the late 1980's to late 2000's, baseball found itself in what is considered its steroid era. Players across the league were using steroids to succeed, and when news of its propensity in baseball finally broke, the game was left scarred. In 2003, MLB finally began testing players for steroid usage.

In 2000, MLB and the owners of its 30 clubs formed MLB Advanced Media (MLBAM), a limited partnership which was in charge of managing the league's interactive and internet branches. The main focus of MLBAM was to help MLB centralize all of its electronic and broadcast content as the league moved into the 21st century. MLBAM was tasked primarily with cracking down on copyright violations by fans illegally viewing or recording league owned broadcasts. League ownership sought to make massive revenues from this centralization of content, and was generating excess revenue in only its second year. However, the revenues generated by MLBAM came at the expense of fan generated content and overall fan engagement on emerging social media platforms.

Baseball has stayed largely scandal free following the steroid crackdown of the late 2000's. However, the 2019 season saw the game rocked by another cheating scandal. In 2019, a number of MLB players publicly accused the 2017 World Series champion Houston Astros of using illegal video cameras to steal signs from opposing teams during their championship run. These claims were thoroughly investigated and confirmed by the league, however, no punishments were ever passed down onto the Astros players involved in the scandal.

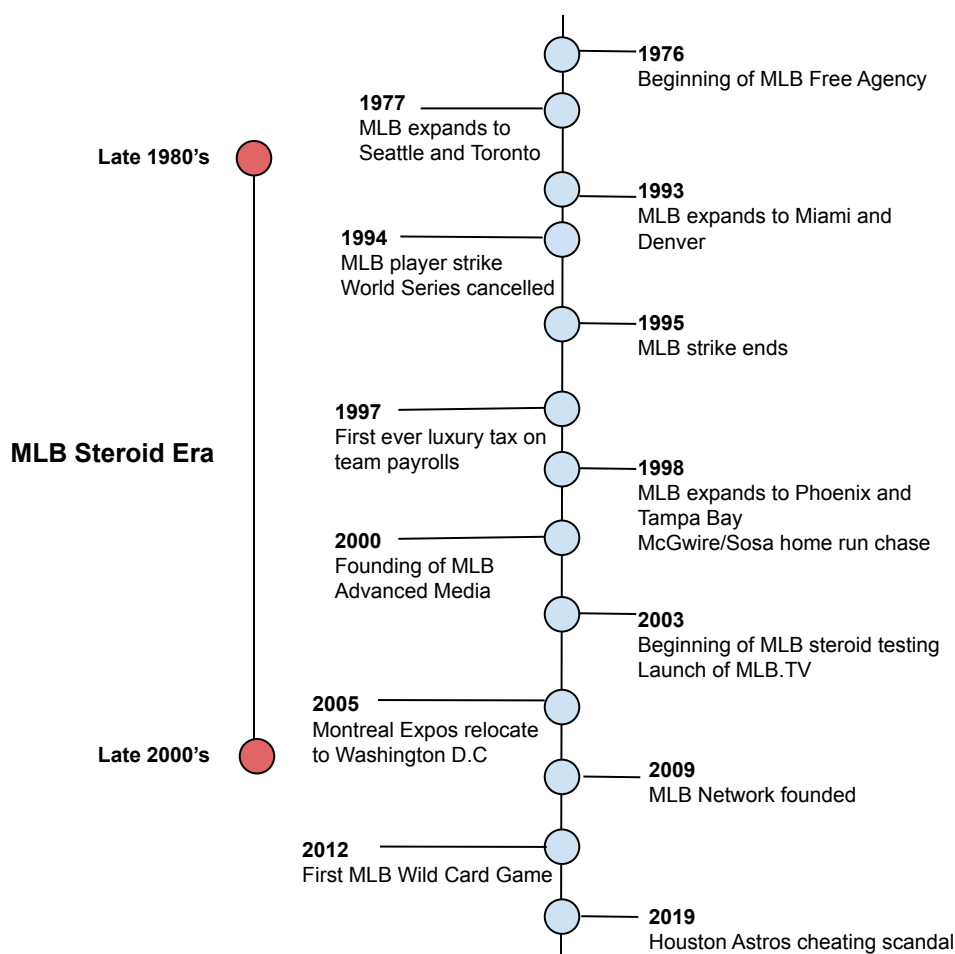


Figure 1: Timeline of Major League Baseball 1976-2019

Overall, this history of potentially negative issues led to this paper's research question: Have MLB management policy changes and decisions, and player and team behaviors outlined above, led to declining attendance and market share? To investigate this research question, a database of historical attendance, attendance rates, and other key metrics has been constructed for MLB, the NFL, the NBA, and the NHL. By analyzing this data, I prove that Major League Baseball has seen declining market share and popularity relative to the other sports leagues. The statistical analysis also investigates correlations between attendance data and city populations and winning percentages to help gain a more complete understanding of why baseball's attendance is faltering where other leagues are not. The statistical data provides a background to investigate the specific policy changes and flaws within the game of baseball. In analyzing this research question, I also investigate the effects of growing competition from the NFL, NBA, and NHL.

STATISTICAL ANALYSIS

In order to analyze the hypothesis that Major League Baseball is declining in popularity in relation to the other three major North American sports leagues, a database was created which contains key quantitative statistics. It contains data for 15 different American cities, each of

which has teams in at least three of the professional sports leagues. These leagues are the NBA, NFL, NHL, and MLB. In selecting the cities, I sought to include a range of population sizes, as well as geographic location. The parameters for city selection provided a well-rounded dataset that is representative of the entire North American professional sports landscape.

The database contains yearly attendance, yearly attendance rate, yearly stadium capacities, yearly city population, and yearly winning percentage for both the specific city and for each league. This database was subsequently used to perform cross-city and cross-league longitudinal analysis using panel data. The methods for creating this database are outlined below.

- I. Collect stadium capacity data
 - a. In order to calculate an accurate attendance rate for the teams and leagues, it was necessary to determine total possible capacity for each team and each league.
 - b. Each home stadium was researched, and total capacity was added into the database. Stadium capacities often changed multiple times within the time frame.
 - c. Capacity was then multiplied by the number of home games each team plays, to give a total yearly capacity.
 - i. *Total Yearly Capacity = Stadium Capacity × Number of Home Games*
 1. MLB = 81 home games
 2. NFL = 8 home games
 3. NBA = 41 home games
 4. NHL = 41 home games
 - d. Capacity is then matched to the proper year
 - i. The MLB and NFL seasons are both contained within one calendar year.
 - ii. The NBA and NHL both take place across calendar years. Data for these leagues represent the year that the season ends.
 1. Example: For the 2018-2019 NHL and NBA seasons, capacity data is represented in the row for 2019
- II. Collect annual home game attendance data
 - a. Each league required different sources for attendance data, so data triangulation was required to confirm accuracy.
 - i. MLB attendance data was gathered from Baseball Reference (<https://www.baseball-reference.com/teams/CHC/attend.shtml>)
 - ii. NFL data was gathered from Pro Football Reference, however only goes as far back as 1993 (<https://www.pro-football-reference.com/years/1993/attendance.htm>)
 - iii. NBA data was gathered from the Association for Professional Basketball Research (<http://www.apbr.org/attendance.html>)
 - iv. NHL data was gathered from Hockey Database (<https://www.hockeydb.com/nhl-attendance>)
 - b. Data were compared against the ESPN attendance database, which only goes back to the early 2000's for all four leagues.
 - i. All sources provided data which matched with the data provided by ESPN
- III. Compute team attendance rate by city

- a. In order to accurately compare the popularity of various teams in the same city, it was necessary to compute a yearly attendance rate for each team
 - i. $Attendance\ Rate = Total\ Attendance \div Total\ Capacity$

IV. Compute league attendance rate

- a. In order to accurately compare the popularity of each league, it was necessary to compute an attendance rate for each league
- b. First, the sum of all yearly capacities for each league was computed
 - i. $League\ Yearly\ Capacity = \Sigma(Team\ Yearly\ Capacities)$
- c. Second, the sum of all yearly attendances for each league was computed
 - i. $League\ Yearly\ Attendance = \Sigma(Team\ Yearly\ Attendances)$
- d. Lastly, league attendance rate was computed
 - i. $League\ Yearly\ Attendance\ Rate = League\ Yearly\ Attendance \div League\ Yearly\ Capacity$

To effectively analyze this database, a statistical analysis tool called STATA was used. After completing the database, all data were stacked into one spreadsheet and imported into STATA. Each sport was given an identifier code in the spreadsheet. STATA is run using a series of input commands which generate graphs and data, which can then be analyzed more effectively and efficiently than other statistical analysis methods. The results of the regressions use a variable called time trend, which is the individual years and their data points. Each unit increase of time trend equates to one year. The time trend for MLB, the NBA, and the NHL is 1976-2019, and the time trend for the NFL spans from 1993-2019.

The first step in the analysis process was to graphically examine attendance and attendance rate by sport. Using a scatter plot of each sport's raw data points, a linear trend line was fitted (Appendix A). After plotting these graphs, linear regressions were run for each league, and the regression results are shown below.

Attendance Linear Regression		
League	Time Trend Coefficient	R-Squared
MLB (1976-2019)	27,364 people/year	0.193
NBA (1976-2019)	7,885 people/year	0.385
NFL (1993-2019)	2,784 people/year	0.0888
NHL (1976-2019)	4,795 people/year	0.276

Figure 2: Attendance Linear Regression Results

Attendance Rate Linear Regression		
League	Time Trend Coefficient	R-Squared
MLB (1976-2019)	0.00925	0.259
NBA (1976-2019)	0.00733	0.216
NFL (1993-2019)	0.004	0.121
NHL (1976-2019)	0.00371	0.147

Figure 3: Attendance Rate Linear Regression Results

In these initial results, I have found that baseball has the highest attendance and attendance rate coefficients of all four sports. Basketball also has strong positive coefficients over the time trend, with hockey and football bringing up the rear. Baseball's strong positive coefficients fall in opposition to the overall hypothesis that baseball is struggling in relation to other sports. However, it is important to understand the capacity utilization of each sport over the time trend.

Average Percentage Capacity Utilization		
League	Starting Utilization	Ending Utilization
MLB (1976-2019)	33.27%	69.37%
NBA (1976-2019)	64.61%	94.51%
NFL (1993-2019)	87.54%	97.89%
NHL (1976-2019)	70.87%	98.52%

Figure 4: Average Percentage Capacity Utilization

Baseball had significantly more room in their stadiums to grow attendance over the time trend than any other sport. MLB has never seen strong overall capacity utilization, a potential pitfall for the league which will be discussed later. The NFL's low growth rate is likely due to their strong historical capacity utilization. In the attendance data gathered for football, the sport regularly sells out stadiums across the full span of the time trend, leaving very little possible increase for the sport. The NBA and NHL have both seen strong improvements in capacity utilization across the time trend.

Although performing linear regressions is a valuable step in data analysis and visualization, it is not reflective of the changes that occur in specific years. The trendline and data are forced into a single line. In order to more accurately represent the changes in attendance and attendance rate over time, the regressions were performed using quadratic terms. The regressions were also run graphically (Appendix B). This provides more accurate coefficients in the last few years of the time trend. The regression results are shown below.

Attendance Quadratic Regression			
League	Time Trend Coefficient	Time Trend Squared Coefficient	R-Squared
MLB (1976-2019)	77,697 people/year	-1,095 people/year	0.233
NBA (1976-2019)	17,487 people/year	-210 people/year	0.421
NFL (1993-2019)	1,461 people/year	-190 people/year	0.108
NHL (1976-2019)	10,484 people/year	-123 people/year	0.300

Figure 5: Attendance Quadratic Regression Results

Attendance Rate Quadratic Regression			
League	Time Trend Coefficient	Time Trend Squared Coefficient	R-Squared
MLB (1976-2019)	0.0201	-0.000237	0.282
NBA (1976-2019)	0.0191	-0.000259	0.251
NFL (1993-2019)	0.0158	-0.000187	0.132
NHL (1976-2019)	0.00953	-0.000126	0.169

Figure 6: Attendance Rate Quadratic Regression Results

In analyzing these results, we see a much more accurate picture of how attendance and attendance rates have changed year by year over the time frame. Baseball, which saw a strong positive linear coefficient, has actually seen substantial leveling and even slight decreases in the last 10 years of the time trend, 2009-2019. In the graphic results, we see that the variance and range between raw data points in baseball is greater than any other sport. This variability year after year shows that baseball possesses a less consistent and reliable attendance pattern than other sports. Meanwhile, both hockey and basketball have seen a decrease in variance and range of raw data points. This indicates that over time, fans of hockey and basketball are attending more and more games, with an increasing number of teams seeing consistently strong attendance rates.

The next step in analyzing the data was to run a more complex set of regression analyses. In the first round of regressions, I did not control for any independent variables like winning percentage, capacity, and city populations. In order to get a clearer picture of attendance trends over time, it was necessary to control for these variables when running the regressions. These are known as fixed effects regressions. Not only does this allow us to control for independent variables that are included within the database, it also allows us to control for time-invariant unobserved aspects of the different cities, such as a city being a good sports town vs. a bad sports town. In these regressions, I also take a closer look at how winning percentage effects attendance and attendance rates.

It is no secret that a winning team leads to increased interest, higher TV ratings and viewership, as well as in-person attendance. Using these regressions, I more closely examined the effects that winning percentage has on attendance across different sports. To do this, I included two lags in the regression output. These lags show the effect that the winning percentage of the past two seasons has on the attendance of the current year. For example, the 2019 Chicago Cubs had a regular season winning percentage of 0.519 (<https://www.baseball-reference.com/teams/CHC/2019-schedule-scores.shtml>) and the 2020 Cubs had a winning

percentage of 0.567 (<https://www.baseball-reference.com/teams/CHC/2020-schedule-scores.shtml>). The lag-2 represents the expected effect that the team's 0.519 winning percentage in 2019 will have on its 2021 attendance, and the lag-1 represents the expected effect that the team's 0.567 winning percentage in 2020 will have. The results of these regressions are shown below.

Fixed Effects Attendance Regression				
League	MLB	NBA	NFL	NHL
Time Trend	26,776*	8,430*	139	3,706*
Capacity	-0.0923*	0.0244	0.58*	0.55*
Population	-0.0472	-0.00456	0.055*	-0.0174
Winning Percentage	3,004,104*	251,501*	53,517*	192,970*
Lag-1	2,265,193*	130,092*	34,047*	155,580*
Lag-2	1,292,156*	43,054	8,768	78,086
R-Squared	0.289	0.448	0.142	0.185

Figure 7: Fixed Effects Attendance Regression Results (statistically significant data is in bold *)

Fixed Effects Attendance Rate Regression				
League	MLB	NBA	NFL	NHL
Time Trend	0.00771*	0.00736*	0.000189	0.00506*
Capacity	-0.000000106*	-0.000000208*	-0.000000067*	-0.000000536*
Population	-1.86E-08	-3.49E-09	0.0000000957*	-0.0000000217*
Winning Percentage	0.733*	0.282*	0.0924*	0.277*
Lag-1	0.569*	0.158*	0.0617*	0.211*
Lag-2	0.301*	0.0413	0.0161	0.0940
R-Squared	0.4086	0.499	0.0168	0.0653

Figure 8: Fixed Effects Attendance Rate Regression Results (statistically significant data is in bold *)

In this regression, the first variable examined is time trend. Much like the original graphs and regressions, time trend shows the increase in attendance and attendance rate each time one year passes. Unsurprisingly, baseball has the highest attendance coefficient, 26,776. This means that on average, attendance increases by 26,776 each year. Attendance numbers for baseball are significantly higher than other sports because of the number of games played in a baseball season. The next highest attendance time trend coefficient is basketball, at 8,430. Hockey has the third highest, at 3,706, and Football has the lowest, at 139. Looking at attendance rate time trend coefficients, we see the same results. Baseball and Basketball have the highest coefficients, both around 0.007, with Hockey and Football following them up. Football's attendance performance

throughout the selected time period is so stable that its time trend coefficients are not even statistically significant, with P-Values for attendance and attendance rate of 0.753 and 0.801 respectively. Neither capacity nor population provide much insight, leaving only winning percentage left.

Out of all the independent variables analyzed in this statistical analysis, winning percentage provides the most insight into the habits of sports fans and their attendance. In order to analyze winning percentage, it is first necessary to understand what the coefficient of winning percentage actually means. For MLB attendance, the coefficient of winning percentage is 3,004,104. However, since winning percentage is represented to the thousandths past the decimal (0.500), we must divide the coefficient by 100. After dividing, we are left with a coefficient of 30,041. This means that for each unit increase in winning percentage, 50.0% to 50.1%, a team's attendance increases by 30,041 fans a season. If a team's winning percentage drops by 1 unit, attendance will fall by the same amount. In the NBA, attendance increases by 2,515, the NFL by 535, and the NHL by 1,929. Since MLB plays 81 home games, the NHL and NBA play 41, and the NFL plays 8, it is necessary to calculate the percentage increase in attendance for each unit increase in winning percentage. The method for calculating this are as follows.

- I. Compute Yearly Average Total Attendance
 - a. In order to calculate the percentage increase in attendance, we must first find the average yearly attendances for each sport.
 - b. $1976 \text{ Average Total Attendance} = 1976 \text{ League Total Attendance} \div \text{Number of Teams}$
 - c. Repeat for each year, for each league

- II. Compute Yearly Percentage of Attendance
 - a. We will use MLB attendance in 1976 as an example
 - b. $\text{Yearly Percentage of Attendance} = \frac{\text{Winning Percentage Attendance Coefficient}}{1976 \text{ MLB Average Total Attendance}}$
 - i. $2.16\% = 30,041.04 / 1,391,728$
 - c. Repeat for each year, for each league

After performing these calculations, we find that winning percentage changes in MLB have the highest effect on attendance.

Average Effect of Winning Percentage on Total Attendance			
MLB	NBA	NFL	NHL
1.43%	0.411%	0.099%	0.30%

Figure 9: Average Effect of Winning Percentage on Total Attendance

In baseball, winning percentage effects attendance by anywhere from just over 1% in some years, all the way up to 2% in others. In the NBA, the effect is lower, from around 0.5% down to 0.3%. The NHL ranges from 0.35% to 0.2%. The NFL has the lowest effect, holding constant around 0.1%. In addition, the lags put into the regression tell a similar story. For MLB attendance, winning percentage from previous seasons has a more substantial impact on the current season's attendance. MLB is the only sport where winning percentage two seasons prior,

Lag-2, has an effect on current season attendance that is statistically significant. The P-Value for Lag-2 in MLB attendance is 0.000. In the NBA, NFL, and NHL, the Lag-2 P-Values for attendance are 0.216, 0.482, and 0.053 respectively. The next step in analyzing the database was to re-run these regressions using the logs of the variables.

Using STATA, all variables excluding time trend have been converted to logarithmic form. By doing this, the coefficients become elasticities, showing an even clearer picture of attendance trends over time. Similar to the non-log regressions, time trend, capacity, and population tell similar stories. It is also necessary to understand what the coefficients of these log variables are saying. I will use the example of MLB's attendance time trend coefficient. The coefficient is 0.0118, which means that the average yearly percentage increase in attendance is 1.18%. Over the time trend, baseball and basketball have the highest growth coefficients, followed by hockey and football.

Log_Variable Fixed Effects Attendance Regression				
League	MLB	NBA	NFL	NHL
Time Trend	0.0118*	0.0151*	0.000374	0.00458*
ln_Capacity	-0.341*	0.0832	0.511*	0.615*
ln_Population	0.0766	-0.07200	0.500*	-0.0217
ln_Winning Percentage	0.760*	0.175*	0.0417*	0.210*
Lag-1	0.501*	0.105*	0.0347*	0.133*
Lag-2	0.247*	0.0212	0.00650	0.0453
R-Squared	0.491	0.392	0.132	0.537

Figure 10: Log_Variable Fixed Effects Attendance Regression Results (statistically significant data is in bold *)

Log_Variable Fixed Effects Attendance Rate Regression				
League	MLB	NBA	NFL	NHL
Time Trend	0.0119*	0.0151*	0.000374	0.00458*
Capacity	-1.219*	-0.916*	-0.488*	-0.384*
Population	5.51E-02	-7.20E-02	0.500*	-2.17E-02
Winning Percentage	0.758*	0.284*	0.0417*	0.210*
Lag-1	0.496*	0.105*	0.0347*	0.133*
Lag-2	0.238*	0.0212	0.0065	0.0453
R-Squared	0.608	0.584	0.0379	0.271

Figure 11: Log_Variable Fixed Effects Attendance Rate Regression Results (statistically significant data is in bold *)

Once again, we come back to winning percentage, the variable that sheds the most light on the mindset of sports fans. As was found in the non-log regressions, winning percentage has a much greater impact on MLB’s attendance than any other sport. Baseball’s attendance winning percentage coefficient is 0.76, meaning for each unit increase in winning percentage, average total attendance increases by 0.76%. The next highest coefficient is the NHL, at 0.21. In fact, baseball’s lag-2 coefficient of 0.247 is higher than any other coefficient, lagged or unlagged. This means that a baseball team’s winning percentage from two seasons prior has more impact on the team’s current year attendance than a current year’s winning percentage has on current year attendance in any other sport. This holds true for attendance rate as well.

The results show that in order to grow attendance, baseball teams need to win. The demand for baseball is far more dependent on success than in other sports. Although MLB attendance is not declining in comparison with other North American sports leagues, I have found evidence that baseball in itself is a less marketable sport and may have less loyal and consistent fans than any other league. Perhaps this was not a problem for the game when sports like football, basketball, and hockey were in their intimacy, but in the current landscape, it could spell trouble for the sport.

DISCUSSION

Season Length

As evidenced by the statistical analysis of attendance data, it is clear that the supply of 162 baseball games over the course of a season greatly exceeds the demand for baseball. For as long as baseball has been played, the sport has boasted a robust schedule. Since 1900, MLB has not had fewer than 140 games per team in a season, the only exception occurring in the 2020 Coronavirus shortened season of 60 games. However, in the modern market, this schedule may be becoming a weak point rather than a strength for the sport. The 162-game schedule is made up so that there is an equilibrium between home and road games, division matchups, cross division matchups, and interleague play. In the eyes of league officials and team owners, more games mean more revenue. However, there is undoubtedly an underlying cost in regards to fan engagement. Baseball provides twice as many games and more than twice as many hours of game time than the next closest professional sports league.

Average Total Time Played Per Team Per Season			
League	Season Length	Average Game Time	Total Hours Played
MLB	162 Games	3:05	499 Hours, 30 Minutes
NHL	82 Games	2:40	214 Hours
NBA	82 Games	2:14	183 Hours, 7 Minutes
NFL	16 Games	2:40	55 Hours, 30 Minutes

Figure 12: Average Total Time Played Per Team Per Season

The modern consumer is obsessed with instant gratification. They want their packages immediately, their TV on demand, and their sports team in the playoffs from day 1 of the season. They want meaningful and impactful games that matter to a team’s success. When the season begins, fan engagement is at its highest. There is hope for each team, everyone is in first place, and there has been no baseball through the long months of Winter. However, as the season creeps into the Summer months, it can be hard for fans to remain engaged with their teams. This is especially true for teams who are not performing on the field. In the statistical analysis, it was

found that a team's success in baseball is significantly more important to attendance than that of any other sport. When a team is clearly out of the playoff picture by game 81, they can expect their second half attendance to suffer, and in a 162-game season, each game is worth only 0.6% of a team's final season result. Baseball games are more frequent, longer, and less important to overall team success, and this season structure puts it in a handicap compared to the shorter and more consequential seasons of other sports. However, the length and structure of a baseball season is not even the most pressing marketing concern for the sport. Baseball has a star problem.

Lack of Impact and Action

It's the bottom of the ninth inning, the game is tied, and the home team is one swing away from winning the game. At the plate is Los Angeles Angels second baseman David Fletcher, a lifetime 0.292 batting average and 10 career home runs. Sitting on the bench is Mike Trout, one of the best baseball players to ever step foot on a diamond, boasting a 0.304 batting average and 302 home runs. There is nothing that Trout can do but watch, the best player in baseball isn't even on the field with the game on the line. This is the nature of baseball. Many fans love this about the sport, that one player can't take every at-bat; the best pitcher in baseball can't take the mound every single day. One player can't step on the field and single handedly win a game for their team. This may be part of the beauty of baseball, but when it comes to marketing the sport and its best players, it can make life extremely difficult. Baseball players are at a disadvantage compared to the stars of the NFL and NBA when it comes to marketability, overall stardom, and cultural penetration because of the lack of impact they have on each game.

Clayton Kershaw, a starting pitcher for the Los Angeles Dodgers, and Mike Trout, an outfielder for the Los Angeles Angels, have arguably been the most dominant players at their respective positions in the 21st century. They are both future hall of famers, and likely top-5 players at their positions in baseball history. In 2019, Kershaw appeared in 29 games, pitching a total of 178.1 innings. That is 17.9% of the Dodgers games, and 12.2% of their total innings played in the regular season. In that same season, Trout appeared in 134 games and had 600 plate appearances. The 2019 Angels had 6,251 plate appearances in the regular season, meaning Trout only took 9.5% of the team's plate appearances. Trout averaged 4.47 plate appearances per game, saw 4.26 pitches per plate appearance, for a total of 19 pitches per game. The average number of pitches in a baseball game is 292; Mike Trout sees 6.5% of the pitches thrown in a game. On the defensive side, Trout averaged 2.26 defensive plays per game, or roughly 1 play every 3 innings. The impact a professional baseball player has on an individual game pales in comparison to that of stars in other sports.

Compare this to LeBron James, the NBA's biggest star. He's one of the most popular athletes and celebrities in the world, and many consider him to be the greatest basketball player in the history of the game. Much of James' stardom stems from his ability to take over a basketball game, to single handedly lead his team to victory. In 2018, LeBron played in 82 games, with a total of 3,026 minutes played. The nature of basketball is that any time a player is on the court, they have the ability to make an impact. James hauled in 709 rebounds, 747 assists, and averaged 19.3 shots each game. His usage percentage, which estimates the percentage of team plays a player is involved in while on the court, was 31.6%. The average usage in the NBA is 20%. Compared to the 6.5% of total pitches seen by Mike Trout in a baseball game, and it's easy to understand why LeBron drastically outshines Trout. Not only is the impact baseball players can have on a game a limiting factor to the game's marketability, the amount of action versus down time in a baseball game is also critical.

Anyone who has watched a baseball game in person or on tv knows how long they can be. Baseball is the only sport that has no clock. One half inning of a baseball game could theoretically last forever. At 3 hours and 5 minutes, the only sport with a longer average game time is football, at 3 hours and 28 minutes. Not only are baseball games long, they are filled with inaction. A 2018 Wall Street Journal study found the average amount of action in a baseball game to be 17 minutes and 58 seconds. Action is broken down into two categories: balls in play/runners advancing, and pitches/foul balls/pickoffs. Balls in play and runners advancing account for 5 minutes and 47 seconds, roughly 3% of total game time. Pitches, foul balls, and pickoffs account for 12 minutes and 11 seconds, about 6.67% of total game time. Just below 10% of a 3-hour baseball game is action. This leaves 2 hours 42 minutes and 2 seconds of inaction, roughly 90% of game time.

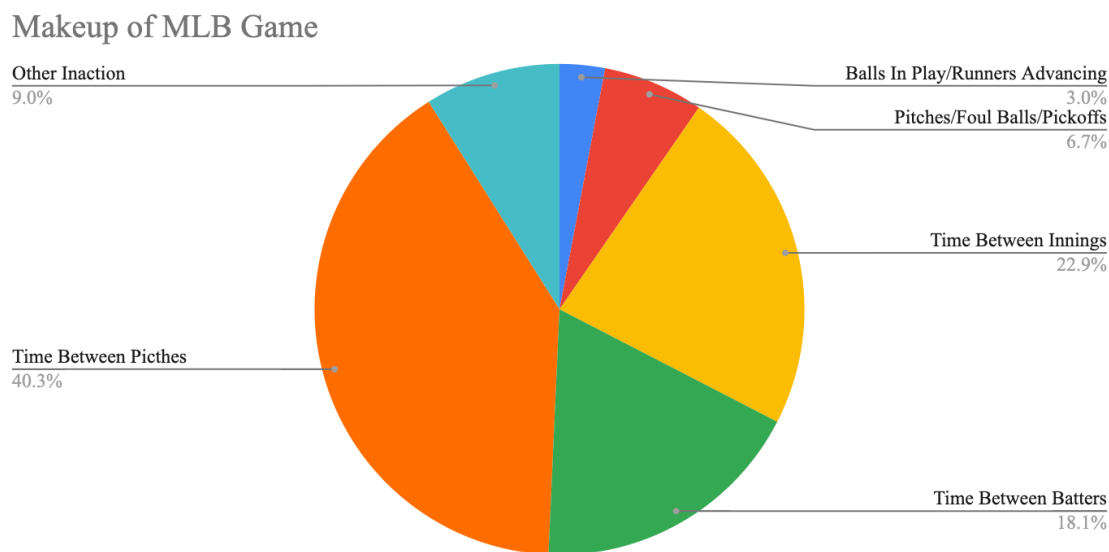


Figure 13: Makeup of Action and Inaction in MLB Game

In the NBA, action occurs as long as the game clock is running. In the NFL, action occurs from the time the ball is snapped, until the referee whistles the play dead. The NHL is similar to hockey in that anytime the clock is running, action is occurring.

Action Percentages by League	
NHL	37.50%
NBA	35%
MLB	9.67%
NFL	9.30%

Figure 14: Action Percentages by League

Although the NFL has lower action percentage than baseball, it is important to remember that their season lasts only 16 games. This means that over the course of each league’s full season, the amount of total time of inaction is far greater in baseball. Less action means fewer exciting and highlight worthy plays, less attention on the game’s best players, and less excited fans. It’s

difficult to create star players when they are either sitting on the bench or standing around in the field for 90% of a game. Using action data from the Wall Street Journal study, I can roughly estimate Mike Trout's individual total action percentage in each game he plays.

- I. Compute Total Offensive Action Time
 - a. Convert pitch action into seconds
 - i. Pitch Action = 12 minutes, 11 seconds = 731 seconds
 - b. Compute average time per pitch
 - i. *Average time per pitch = $731 \div 242 \text{ pitches per game} = 3.02 \text{ seconds}$*
 - c. *19 pitches per game $\times 3.02 \text{ seconds per pitch} = 57 \text{ seconds of pitch action}$*
- II. Compute Balls in Play/Runners Advancing Action
 - a. Assume this action is equally distributed between all 18 lineup players
 - b. Convert action into seconds
 - i. Action = 5 minutes, 47 seconds = 347 seconds
 - c. Equally distribute action
 - i. *347 seconds of total action $\div 18 \text{ players} = 19 \text{ seconds per player}$*
- III. Compute Action Percentage from Average Game Time
 - a. *57 seconds of pitch action + 19 seconds of balls in play action = 1 minute, 16 seconds of total action*
 - b. *Action Percentage = $1 \text{ minute, } 16 \text{ seconds} \div 3 \text{ hours, } 5 \text{ minutes} = 0.6\%$*

Unless MLB changes how the game is played on the field, Mike Trout will never be involved in more of the game's action than he already is. However, modern technology has provided athletes with an array of additional tools to help them market themselves, their teams, and their sports off the field.

Social Media

Social media is one of the most powerful resources for businesses in any industry. In most cases it is free, accessible, and easy to use, and with the majority of the population utilizing at least one form of social media, it provides unmatched opportunities to connect with consumers. Not only is social media a great tool for marketing a business, it is also very effective at marketing individual users. Professional athletes are some of the most followed accounts on social media sites. With millions of followers, athletes can market themselves, their sponsors, their teams, and their sport itself. "In the sports industry, marketers are using SM platforms to implement a variety of marketing communication elements such as athlete endorsements (Brisson, Baker, & Byon, 2013), promotions (Hambrick & Mahoney, 2011), public relations (Waters, Burke, Jackson, & Buning, 2011), news updates (Reed & Hansen, 2013), and relationship marketing" (RM; Williams & Chinn)" (Abeza et al., 2017). Social media has provided athletes, teams, and fans platforms to freely share content, platforms on which the popularity and reach of professional sports could grow. Social media has brought "instantaneity, ubiquity, time unrestrained access (Williams & Chin, 2010), and simplicity and ease of access, networking, participation, and collaboration" (Abeza et al., 2017). Leagues and players that recognized the importance of social media, and the marketplace of free content it presented, flourished.

Since the early 2000's, the NBA has used player driven strategies to greatly outperform any other North American professional sports league in social media presence. The NBA saw the potential of unrestricted content as a means of growing the game's popularity and star players, and are now reaping the rewards. The league employs "nonrestrictive policies on sharing video

online and exposing its player’s personalities” (Abdourazakou & Deng, 2019). The league has excelled in catering to young fans through social media, one of the reasons why the NBA has the youngest average viewer age of all leagues (Jayski, 2017).

While the NBA was growing its following through free content and access, Major League Baseball was monetizing and controlling all baseball content on the internet. In 2000, MLB and the owners of its 30 clubs formed MLB Advanced Media (MLBAM), a limited partnership, which was in charge of managing the league’s interactive and internet branches. The main focus of MLBAM was to help MLB centralize all of its electronic and broadcast content as the league moved into the 21st century. MLBAM was tasked primarily with cracking down on copyright violations by fans illegally viewing or recording league owned broadcasts. League ownership sought to make massive revenues from this centralization of content, and was generating excess revenue in only its second year. However, as technology evolved and social media became a more important element of sports fandom, the complexity of copyright issues greatly increased. Fans began creating GIFS, posting small segments of video, sharing pictures, and MLBAM stepped in. The organization routinely issued DMCA takedown notices for this fan generated content, most commonly posted to social media, as it infringed on MLBAM’s copyrights. Although MLBAM has been a huge cash cow since its inception, with revenues reaching \$1.2 billion in 2016, in the words of MLB pitcher Trevor Bauer “It’s led to a missing generation of fans”.

The goal of a league should always be to increase fan engagement, viewership, and create customer loyalty, and “using copyright law to shut down fans engaging in discussions about their product is not a legally or commercially viable way to achieve that goal” (Rissler, 2016). Not only was MLBAM bad for fan engagement, it was also incredibly harmful to MLB’s ability to market itself. When a user creates a piece of content, or posts a video from a game on social media, it’s free advertising. Everyone that follows that person will see that video. If the video is high quality, and makes a significant amount of impressions, it can have the ability to go viral, reaching a potential audience of millions of people. In 2019, 22% of Americans reported being active on twitter in a study done by the Pew Research Center (Hughes et al., 2019). In an article from SB Nation by Matt Goldman in 2015, he writes that “Looking at a gif, or video on an unaffiliated account, or website, deprives MLB.com of valuable clicks, and ultimately some marginal ad revenue from their various sponsors.”. MLB sacrificed free marketing in order to maintain control of their content. Rissler writes that “Each time MLBAM decides that someone is unfairly and illegally using its content, and chooses to issue a DMCA takedown notice, it is intentionally making it more difficult for its fans to enjoy and interact with their game”. Baseball is finally getting on the right track, easing restrictions on content and utilizing social media to promote the game and its players. However, baseball has dug itself into a social media hole that will be incredibly difficult to dig out of.

Baseball and its star players consistently trail other sports leagues and their stars in social media followings, and it isn’t even close. As of Spring 2021, MLB ranked behind both the NBA and the NFL in total followers. This trend is consistent for the followings of the star athletes in each of these leagues.

Social Media Followings by League		
League	Instagram	Twitter
NBA	54.9 million	32.8 million
NFL	20.3 million	26.5 million
MLB	7 million	8.8 million

NHL	4.9 million	6.3 million
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Figure 15: Social Media Followings by League

Social Media Followings by Athlete			
Athlete	League	Instagram	Twitter
Lebron James	NBA	81.8 million	49.5 million
Stephen Curry	NBA	33.2 million	15.1 million
Odell Beckham Jr.	NFL	14.3 million	4.1 million
Tom Brady	NFL	8.2 million	1.8 million
Mike Trout	MLB	1.8 million	2.5 million
Bryce Harper	MLB	1.7 million	1 million

Figure 16: Social Media Followings by Athlete

Baseball is not a star driven league like the NBA. As proven in the statistical analysis, it is driven by team success; it is driven by wins. The sport will likely never have an athlete like Lebron James, a worldwide superstar who transcends the game itself, but that doesn't mean that baseball can't do better. As the league continues to expand its social media presence and embrace more modern sports marketing techniques, it still has one major hurdle to overcome in its path to marketability, and regaining its national popularity and cultural relevance.

The Old School Game

Baseball's storied past and traditions have long been held up by the game's fans as what makes the sport so beautiful. The gentlemanly demeanor of players and spectators alike, the civility of the games, the respect for the sport itself, all contribute to the idea of baseball as an old school game. For the majority of its history, the sport has held itself up on its traditions, and the men in charge have been lifelong baseball players. It is a game built on "unwritten rules" of sportsmanship, fair play, and respect. Don't celebrate too much when you succeed, don't steal a base when you're winning big, don't swing in a 3-0 count. In describing his view on baseball, Chicago White Sox manager Tony La Russa said "The way it was described to me was, it's team against team. That's what our sport is, with these very talented individuals matching up. What it isn't, though, is an exhibition of your talents". Baseball sees itself in an ivory tower of sorts, looking down on new sports, new methods, and changing consumer tastes. Baseball is the national pastime, why should it possibly change? However, this unwillingness to adapt the game to a modern audience in a timely fashion has also greatly contributed to a decline in market share.

In recent years, conversation about the sport's unwritten rules has sparked a fierce battle between so called baseball "purists" and those who wish to bring the game into the modern era. Baseball has seen an influx of young talent, with younger players ascending to the big leagues at a far faster rate than in previous decades. The average age of MLB position players dropped from 29.1 in 2007 to 28.1 in 2018 (Blengino, 2019). These young players, many from the Dominican Republic and Cuba, play an energetic style of baseball. They play with flair, passion, and confidence. However, the old guard of baseball has been vocal in their distaste for what these young players bring to the field. They claim it to be unsportsmanlike, that it is one player showing up and embarrassing another, that it goes against the character of the game. Former Yankees pitcher and Hall of Famer Goose Gossage once called Toronto Blue Jays player Jose Bautista "a [expletive] disgrace to the game. He's embarrassing to all the Latin players, whoever

played before him” after Bautista celebrated a game winning home run in the playoffs. This antiquated attitude is incredibly dangerous and represents a key reason why baseball has struggled so much in recent years. When players attempt to bring energy and excitement into the game they are degraded, rebuked, and attacked by announcers, critics, and other players. Fans want excitement, energy, and conflict within the game. They don’t want to watch players sheepishly walk around the field like in baseball games of old. If old school baseball players and fans can’t accept that the sport they love must change, then baseball will never regain its grip on the American sports fan.

While baseball argues over whether players can celebrate and express themselves on the field, the NBA and NFL have integrated themselves and their stars into modern American culture. The days of baseball being a barometer for cultural progress and national identity in America are long gone. For the entirety of its history, baseball has been a game controlled by white men. Even following integration of the league, its management has still been dominated by white men. There has never been a commissioner of baseball who is an ethnic minority. As the country became steadily more racially and culturally diverse, and more urban, sports like football and basketball took advantage in attempts to pull market share away from baseball. Basketball incorporated hip hop and fashion into the very fabric of the game. Today, basketball is a central institution not just of sport, but of culture across the whole country. Baseball is already backed against a wall in regards to marketability due to its low percentage of action and low impact of its star players, as well as its failures in the early years of social media marketing. The unwritten rules of baseball set the sport even further back in marketability, as they restrict players even when they do make an impact on the game.

The Superstar Externality

Simply put, baseball is a sport driven by its teams, not its stars. The performance of a team as a whole has a significantly stronger effect on a team’s attendance, and the nature of the game combined with managerial mistakes from inside baseball has exacerbated this situation. If baseball wants to compete with star driven leagues, like the NBA and NFL, it needs to create national superstars of its own. Star players have the ability to create relationships with fans that are outside of their own markets. They become ambassadors for their sports, increasing attendance and overall popularity both on and off the field. The NBA has a “superstar externality” (Berri & Schmidt, 2006). They found that star players in the NBA single handedly generate increased revenue and attendance at road games, and a study conducted by Leonard and Haussman in 1997 found that television ratings for NBA games are substantially higher when “superstars” are involved. The beauty of superstars that go beyond their own market is that it gives fans a reason to watch, regardless of their own team’s performance. LeBron James is his own product; even when he is scoring 40 points against your team, he is still must-see basketball. Larry Baer, CEO of the San Francisco Giants states “It’s very important to have stars that transcend their local markets. When you have the jewel events [like the World Series], you don’t want fans turning off the TV if their teams aren’t in it. It’s a challenge for baseball because we are the most tribal sport”. Whether you believe that baseball is the most tribal sport or not, it is difficult to deny the lack of stardom achieved by modern baseball players. In ESPN’s 2019 world fame athlete rankings, only 1 baseball player ranked in the top 100: Bryce Harper, athlete number 99. In comparison, the NBA had 15 athletes and the NFL had 7 athletes ranked in the top 100. In modern sports marketing, national marketability is driven by star players, not star teams.

CONCLUSION

The stark reality that Major League Baseball must face is that they are struggling to engage modern sports fans. The structure of the game is not conducive to modern consumer tastes, and management's unwillingness to adapt the way the league operates, or the way in which the game is played on the field, is sending baseball down a difficult path to recover from. Each season that passes with MLB doing little to change is cementing baseball behind the NBA and NFL in national popularity. National audiences crave national stars, they crave action that forces them to buy tickets regardless of their team's performance. This research has found that compared to other sports, baseball simply does not have that kind of draw. However, baseball is not collapsing, as the original hypothesis of this research suspected. Fans are still attending games, tv ratings for baseball games broadcast in local networks are still strong, and a Summer day at the ballpark will always be a slice of Americana. No, baseball is not dying. But it no longer has the grasp on this country like it once did.

APPENDICES

Appendix A: Linear Regression STATA Scatterplots

MLB

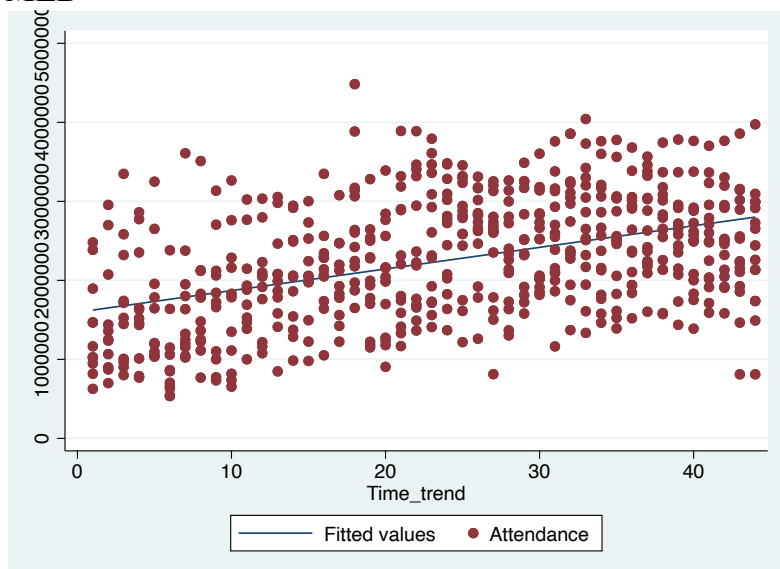


Figure 1: MLB Attendance by Year

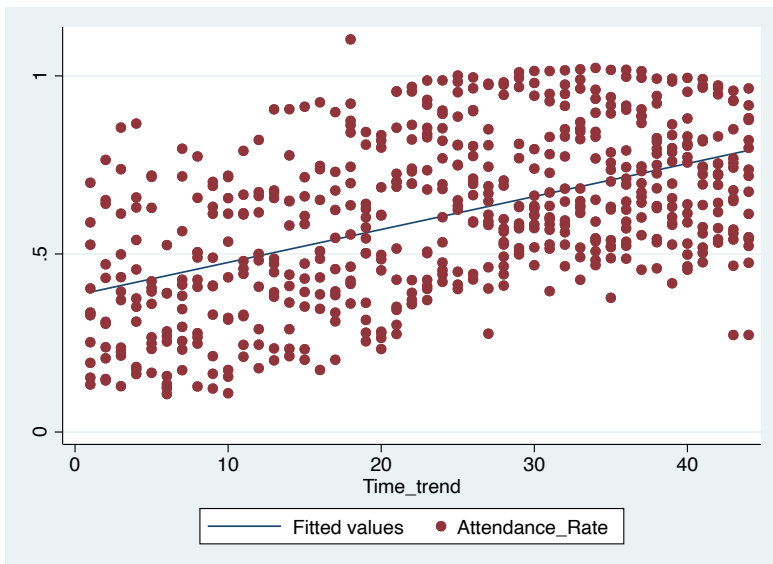


Figure 2: MLB Attendance Rate by Year

NBA

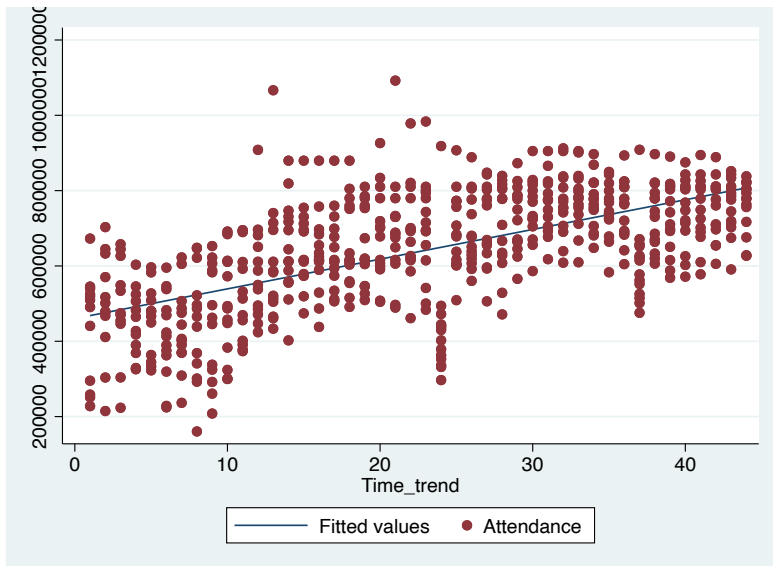


Figure 3: NBA Attendance by Year

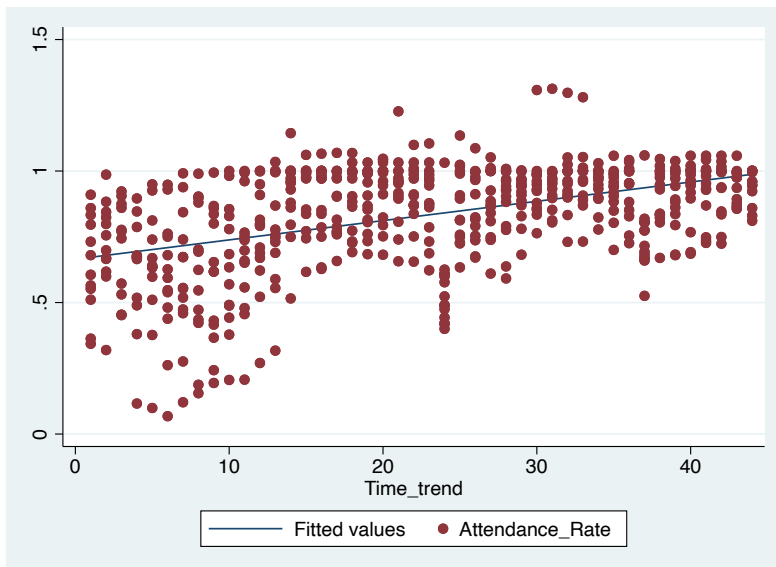


Figure 4: NBA Attendance Rate by Year

NFL

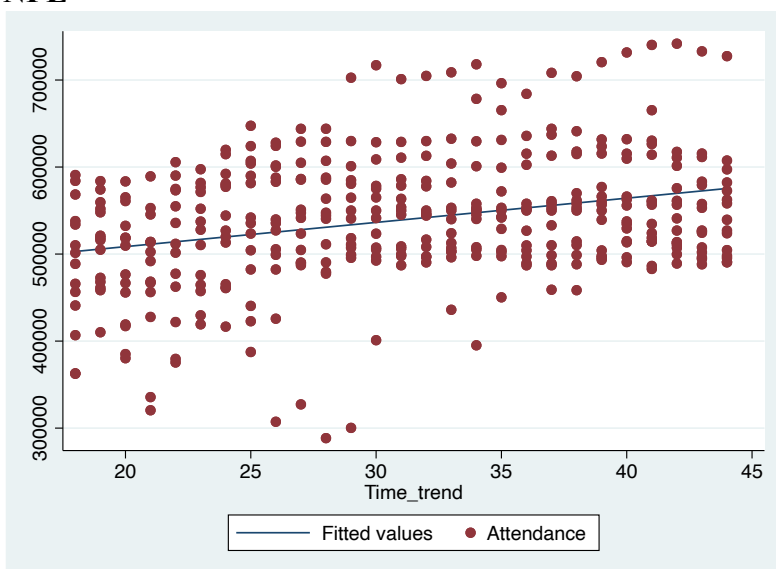


Figure 5: NFL Attendance by Year

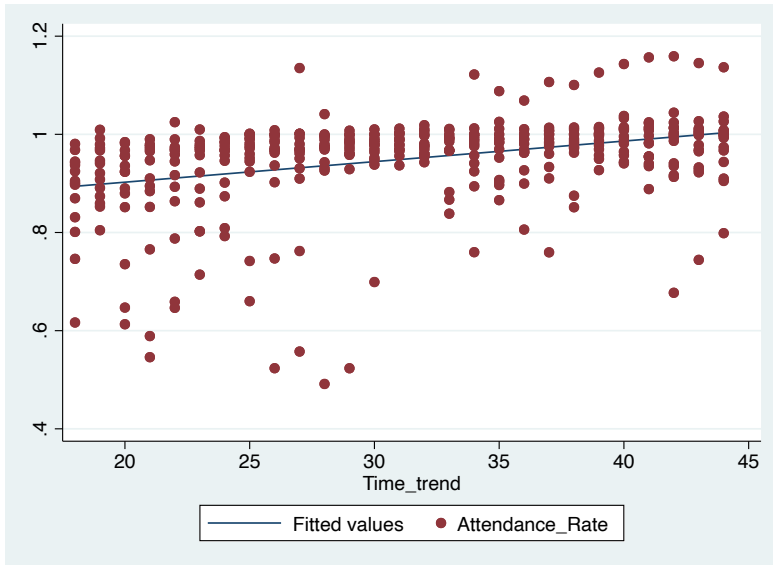


Figure 6: NFL Attendance Rate by Year

NHL

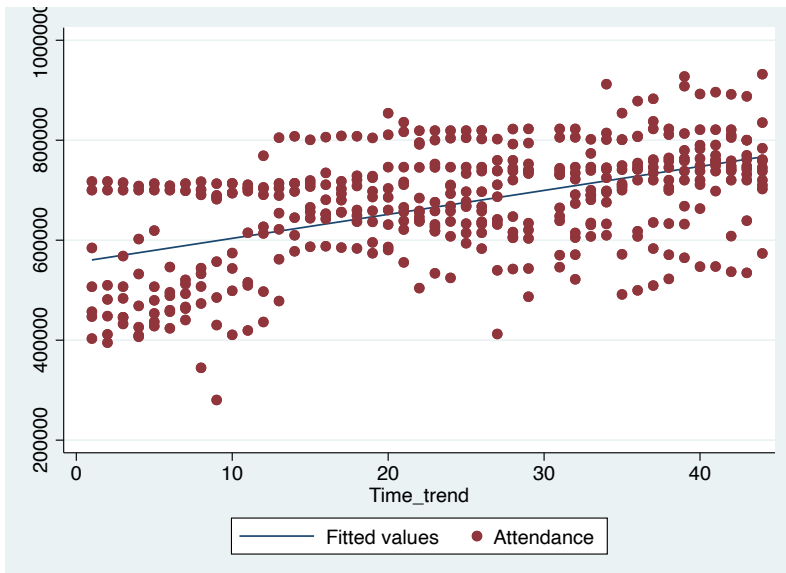


Figure 7: NHL Attendance by Year

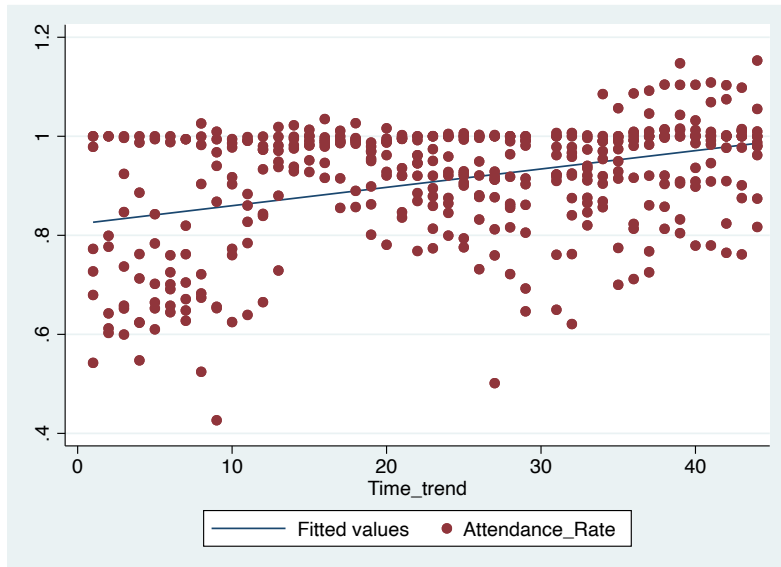


Figure 8: NHL Attendance Rate by Year

**Appendix B: Quadratic Regression STATA Scatterplots
MLB**

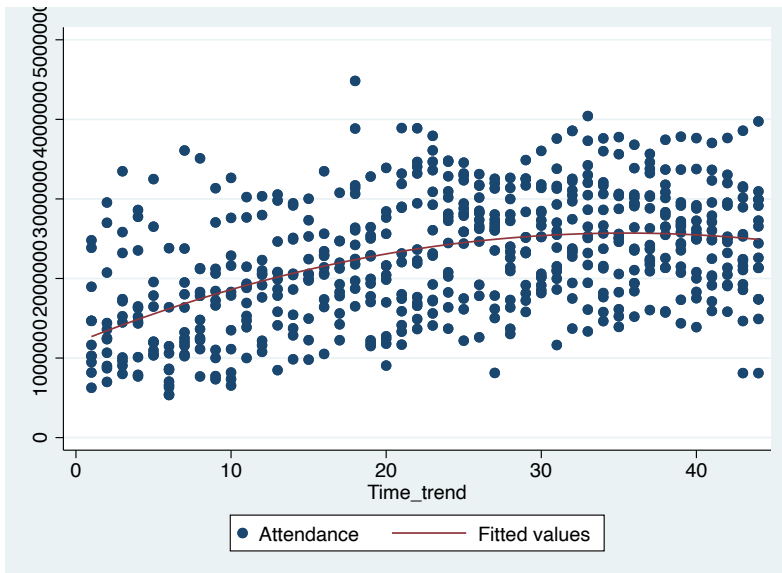


Figure 9: MLB Attendance by Year with Quadratic Trendline

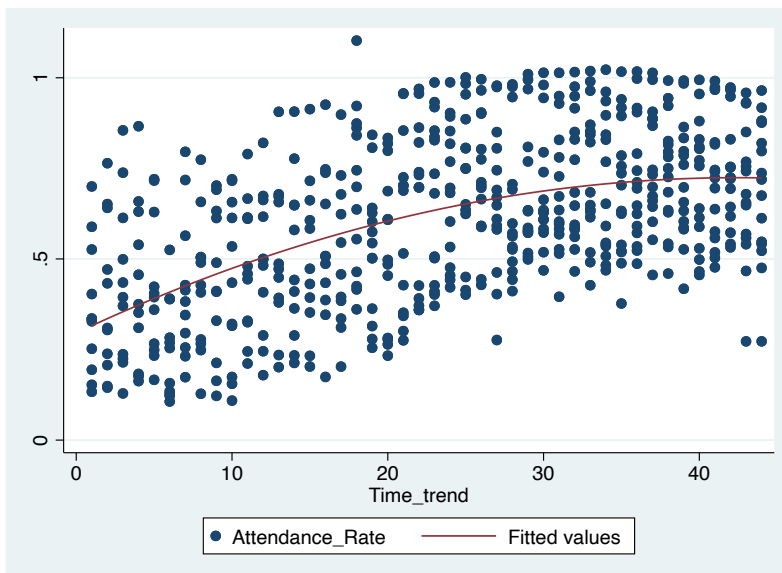


Figure 10: MLB Attendance Rate by Year with Quadratic Trendline

NBA

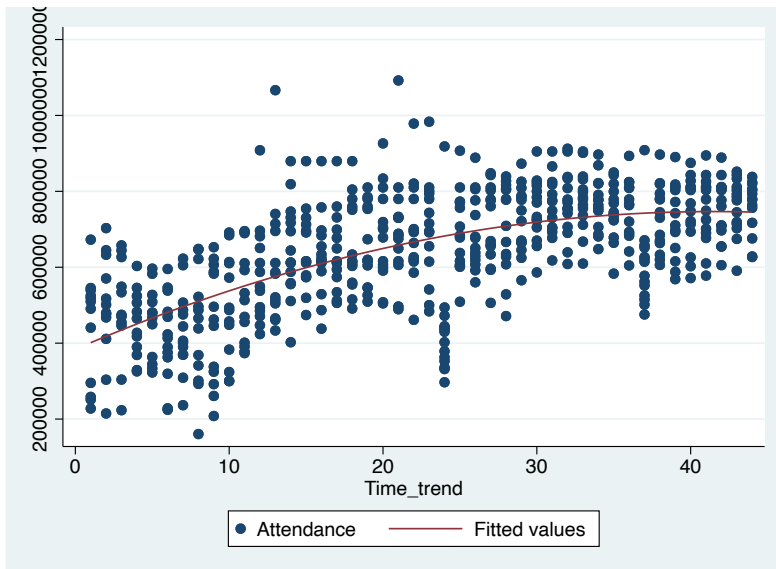


Figure 11: NBA Attendance by Year with Quadratic Trendline

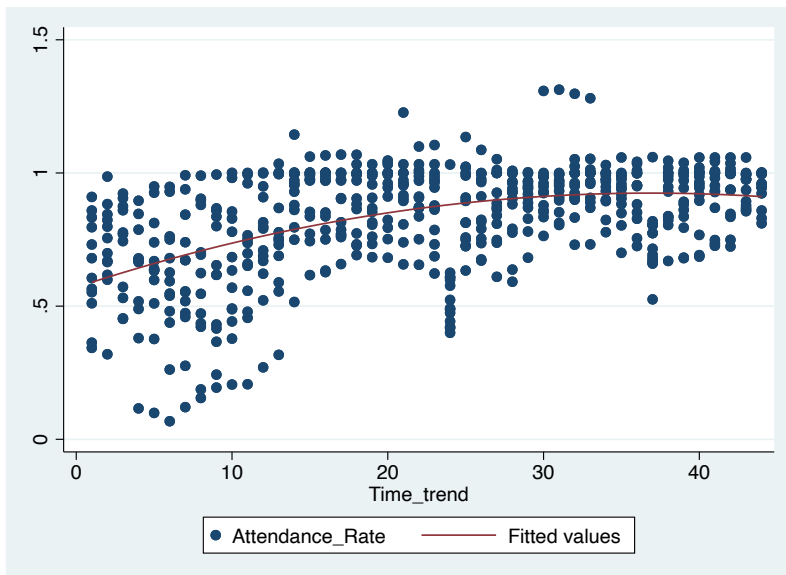


Figure 12: NBA Attendance Rate by Year with Quadratic Trendline

NFL

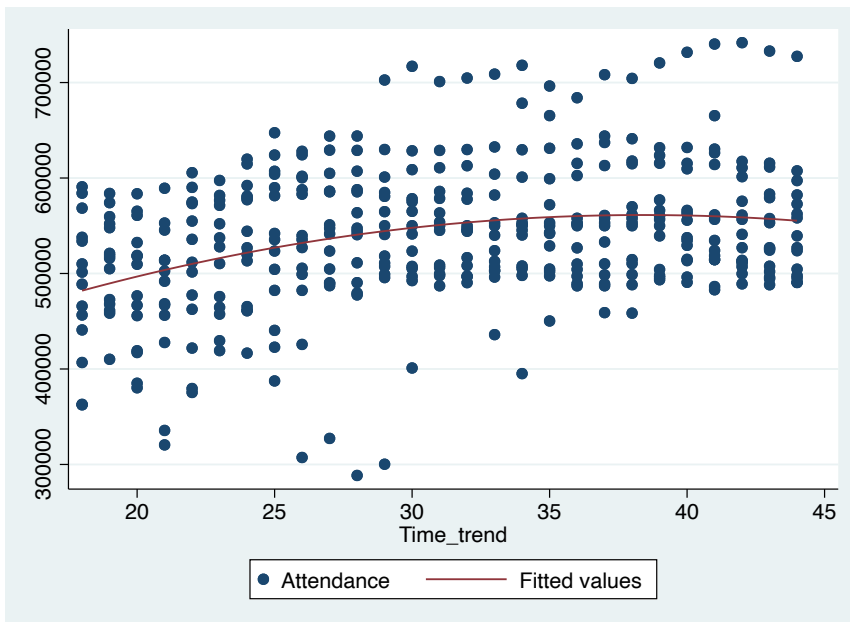


Figure 13: NFL Attendance by Year with Quadratic Trendline

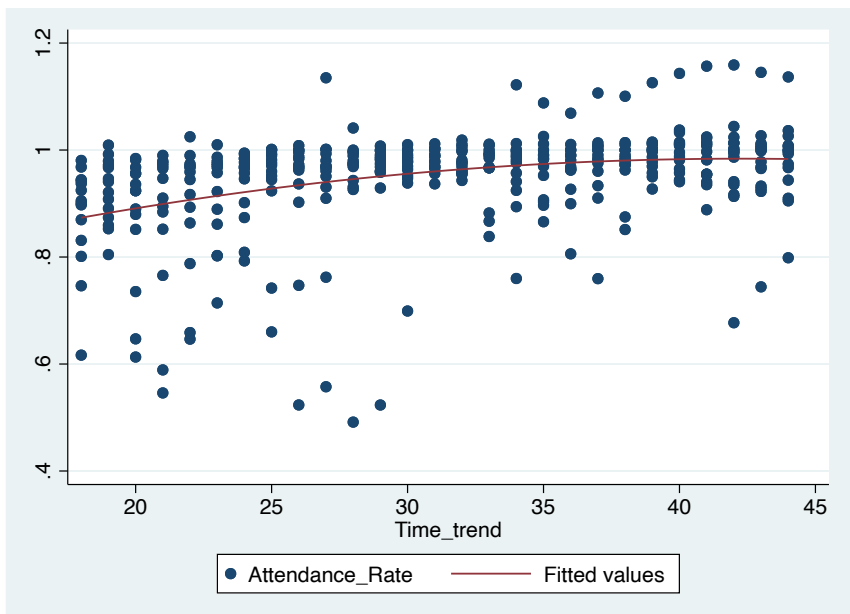


Figure 14: NFL Attendance Rate by Year with Quadratic Trendline

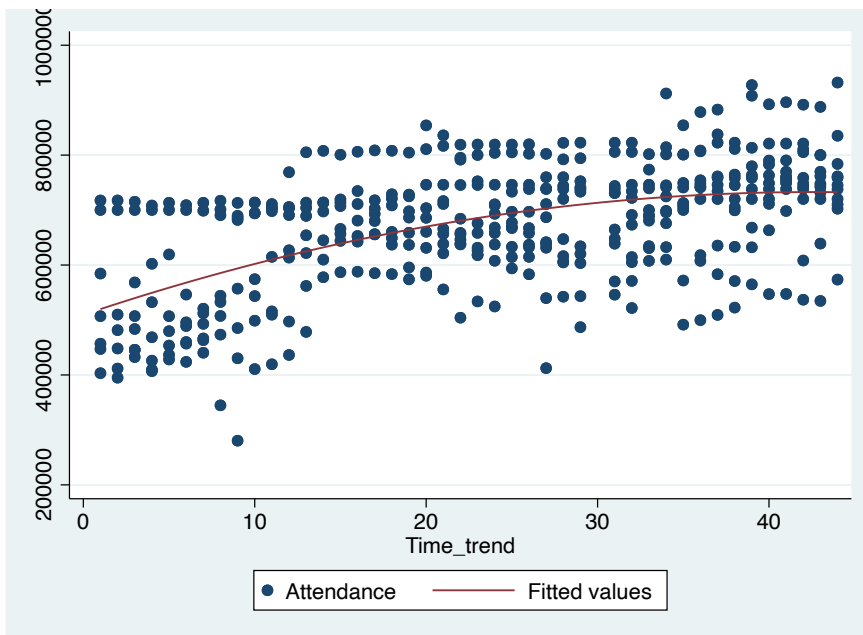


Figure 15: NHL Attendance by Year with Quadratic Trendline

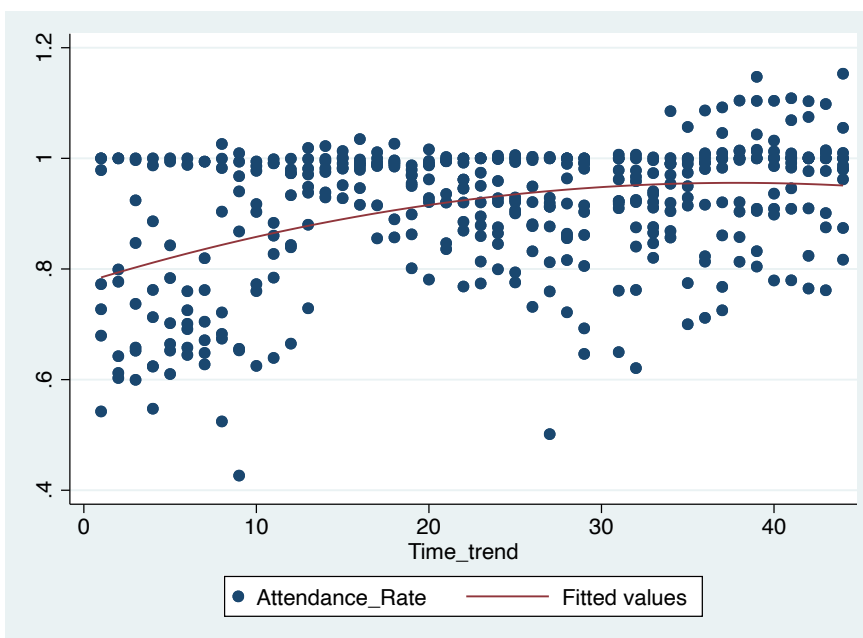


Figure 16: NHL Attendance Rate by Year with Quadratic Trendline

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