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An Analysis of Sports Markets: Franchise Relocation, League Expansion, and Fan Bases

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An Analysis of Sports Markets: Franchise Relocation, League Expansion, and Fan Bases

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I. Abstract

Through sports, cities can reach fans from all different walks of life to rally together and support a competitive cause. Each city's fan base is distinct—with their individual personalities being reflective of the culture and environment of the home city. The intent of this paper is to study the effect of multiple on and off field factors as they relate to attendance across three major professional sports in city markets. This will determine which city markets have the strongest, or weakest, overall fan bases. Ultimately, this study will end with an educated recommendation for professional sports franchise relocation or a league expansion.

II. Introduction

American sports are a monster industry, raking in nearly $67.7 billion dollars annually between college, major, and minor leagues.[1] Having an engaged, passionate, and interested fan base can give any team an edge over a small or uninterested fan base. A perfect example of this is found through the Seattle Seahawks, who boast one of the most rabid fan bases in all professional sports. Notorious for the noise these fans make during games, Seattle fans give their team one of the strongest home-field advantages in football.[2] On the other hand, a weak fan base can be toxic. The former St. Louis Rams struggled so badly with attendance that they decided to move to Los Angeles for the 2016 season.[3] Interestingly, these same St. Louis fans that failed to show up for Rams games were some of the most supportive in the league for their baseball team. In fact, Forbes ranked St. Louis the #1 fan base in all of Major League Baseball.[4] My study will analyze some of the factors that might contribute to fan base loyalty. Perhaps some cities are better suited for a particular sport based on certain exterior factors, or perhaps a long history of success is what keeps the turnstiles rotating. I will examine teams in three major North American sports leagues: Major League Baseball (MLB), the National Football League (NFL), and the National Basketball Association (NBA), and look for different factors that may help determine how loyal overall fan bases can be.

A particularly interesting relocation hotbed is Oakland, California. This metro area of around 2.5 million people[5] has three professional teams—the Raiders (NFL), Warriors (NBA), and Athletics (MLB). All of these teams have looked seriously or committed to relocation in the past

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[1] Eichelberger, Curtis. "Sports Revenue to Reach $67.7 Billion by 2017, PwC Report Says." *Bloomberg.com*.
[2] Langland , Tyson. "Analyzing Competitive Advantage of Seattle's Home-Field." *Bleacher Report.*
[3] Busbee, Jay. "New Study Ranks the NFL's Best and Worst Fan Bases; Where's Yours?" *Yahoo! News.*
[4] "MLB's Best Fans." Forbes.com. *Forbes Magazine*
[5] "Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2015." *US Census Bureau.*

10 years.[6] In this market, competition with neighboring San Francisco teams is fierce. The A's and Raiders have consistently ranked near the bottom of their respective leagues in attendance over the last ten years, while the San Francisco Giants and 49ers have ranked near the top. I will analyze what factors have contributed to this phenomenon and project these factors onto potential locations for teams looking to relocate. The Raiders have been especially active in relocation efforts--putting in a serious bid for a move to Los Angeles last year, and more recently looking at a move to Las Vegas.[7][8]

Las Vegas presents a unique competitive market for teams looking to relocate. In this city, entertainment is king, as Las Vegas boasts one of the strongest gambling industries in the nation.[9] The only sports competition in Las Vegas is a minor league baseball team,[10] UNLV, and a newly-announced NHL expansion franchise.[11] One can imagine this franchise's popularity might mirror that of the Phoenix Coyotes—after all, how much interest can an ice hockey team located in a desert really create? In his piece "Obstacles Facing NHL's Expansion Team in Las Vegas,"[12] Sports Illustrated writer, Jeremy Layton, argues that despite solid performance by warm weather NHL teams, their attendance figures suffer compared to cold weather teams. For these teams, like the Minnesota Wild or Buffalo Sabres, ice hockey holds more cultural significance due to the colder climate compared to somewhere like Phoenix. The graph below from Mr. Layton's article backs up these claims:

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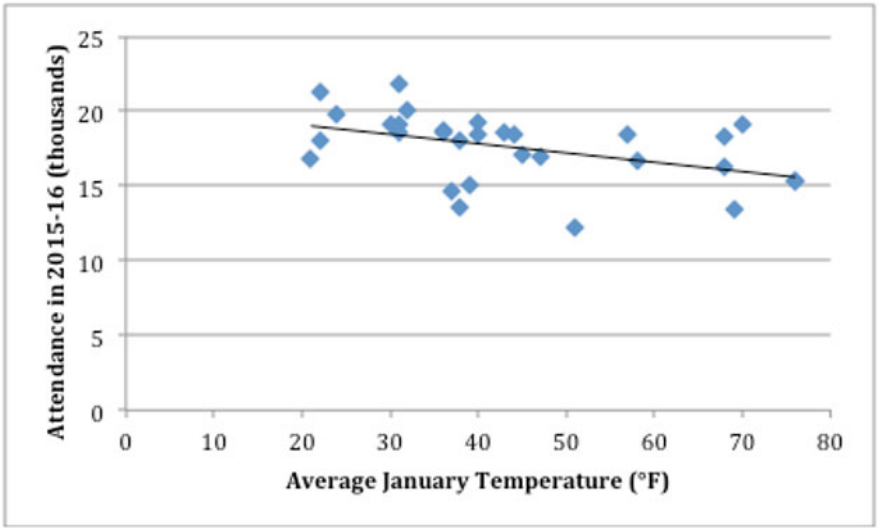
[6] Diaz, John. "Oakland Losing Stadium Game: 1 Team Gone, 2 to Go?" *San Francisco Chronicle.*
[7] Wilson, Aaron, and Rachel Swan. "Rams, Not Raiders, Approved for Move to Los Angeles." *SFGate.*
[8] Gutierrez, Paul. "Raiders' Davis: Want to Move Team to Vegas." *ESPN.*
[9] Lee, Sarah, and Brandi Poss. "Best Gambling Destination Winners: 2015 10Best Readers' Choice Travel Awards." *10Best*.
[10] "The Official Site of The Las Vegas 51s | Lv51.com Homepage." *Las Vegas 51s.*
[11] Beacham, Greg. "AP Source: NHL Settles on Las Vegas for Expansion." *The Big Story.*
[12] Layton, Jeremy. "Obstacles Facing NHL's Expansion Team in Las Vegas." *Sports Illustrated*.



[13]

While the trend is subtle, it is definitely significant. Based on this data, I see an unlikelihood that hockey will thrive in the deserts of Las Vegas.

In Los Angeles, we see a much different story. Not only is the entertainment industry massive[14] with the proximity of Hollywood and Disneyland, but any prospective sports team would also have to compete with deeply rooted professional teams like the Dodgers and Lakers, along with colleges like USC and UCLA. For an NFL franchise like the Rams, the huge population in Southern California and the lack of any football competition closer than San Diego may have benefits that outweigh these factors against them.

Through these examples, we can see a variety of outside factors that may have influence on how strong a team's fan base is in a given city. My regression will examine how much impact these factors have, or if attendance is simply reflective of wins and losses. As part of my analysis, I will use the characteristics of these cities to help analyze how loyal fans are in certain locations.

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[13] Layton, Jeremy. "Obstacles Facing NHL's Expansion Team in Las Vegas." *Sports Illustrated*..
[14] Harden, Seth. "Largest Industries in Los Angeles County." *Statistic Brain*

III. Literature Review

Studies on fan loyalty are abundant, yet many are not accessible to the public. Understanding a fan/customer base is essential for any team or business, so teams often study subtle trends within attendance, turnstile clicks, and TV viewership to determine the climate of their fan base.[15] Unfortunately, teams keep most of this data private, limiting the research potential for outside parties. Currently, some freelance studies have looked at fan bases for a single team based on a variety of measurable factors—social media presence, revenue, etc. In short, my study looks to expand these studies from just one team to a metropolitan area as a whole.

In his book, *Playing the Field: Why Sports Teams Move and Cities Fight to Keep Them*[16], Charles Euchner addresses the general relationship between team and city. Knowing that cities see huge financial profits and better quality of life from the presence of sports, teams can "blackmail" the city through threats to leave. Euchner uses the 1982 Chicago White Sox, who promised to stay in their current location only if the city approved a $5 million measure to add luxury boxes to their stadium.[17] Shortly later, the White Sox threatened again to move to Tampa until the city promised a new stadium. I will use Euchner's study to help provide the rationale behind some of the variables in my regression.

The book *Big Sports, Big Business: A Century of League Expansions, Mergers, and Reorganizations*[18] covers the different advantages some teams have experienced through relocation over the past 100 years. Author Frank Jozsa explores how some outside factors such as economics, demographics, government, and marketing effect a team's ability to thrive in their

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[15] Shearer, Mark. Interview in phone call with author.
[16] Euchner, Charles C. *Playing the Field: Why Sports Teams Move and Cities Fight to Keep Them.*
[17] Ibid, 133.
[18] Jozsa, Frank P. *Big Sports, Big Business: A Century of League Expansions, Mergers, and Reorganizations.*

community and on the field. His highlight is the Montreal Expos' move in 2005 to Washington DC. Jozsa claims that this move directly led to increases in attendance and media revenue.[19] This book is very similar to my study, yet it is fairly limited to relocation situations and is more historical than econometric in nature. My study on the other hand, covers a comprehensive analysis of every sports team's attendance over certain years.

Home Team: Professional Sports and the American Metropolis[20] by Michael Danielson explores the relationships between different sports teams within one city. Specifically, Danielson looks at how factors such as business, politics, payment for and location of stadiums affect fans' perception of their home teams. These factors can be big determinants for city identification and culture, and the book looks at how sports fits into that environment. Some teams, like the Green Bay Packers, have deep connections with the culture of their cities,[21] and this could highly affect their fan support. On the other hand, a newly formed expansion team will not have these same roots in the city's culture, possibly leading to lower attendance and less identification with their home fans.

Consulting firm, Brand Keys, conducts yearly studies by sport that determine how loyal a fan base is to a team, depending on mostly on-field factors.[22] In these studies, they use an Entertainment Factor (performance on the field), perceived authenticity of the team (measured by managerial changes, new stadiums, etc.), how well-respected the team's players are around the sport, and a team's history and tradition in the current area. This study is a slimmed down version of mine, which will incorporate more outside factors along with these on-field determinants. While a team's play on the field certainly affects attendance to some extent, I want to push this

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[19] Jozsa, Frank P. *Big Sports, Big Business: A Century of League Expansions, Mergers, and Reorganizations,* 85.
[20] Danielson, Michael N. *Home Team: Professional Sports and the American Metropolis.*
[21] Teske, Robert T. "Cheeseheads, Tailgating, and the Lambeau Leap: The Green Bay Packers and Wisconsin Folklife." *PBS.*
[22] Passikoff, Robert. "Most Loyal Fans In Baseball." *Brand Keys.*

study to the next level with the incorporation of outside factors. Additionally, my study will focus on the city as a whole compared to just one team.

Professor Mike Lewis of Emory University conducted a few studies in 2014 to measure different factors of fan loyalty in baseball titled *Marketing Analytics & Marketing Assets: Brand Equity, Customer Equity & Dynamic Pricing*.[23] His model measures revenue against performance, "team factors" like payroll, stadium factors, All-Stars, and "market potential," which includes metro area population, median income, and average education level. This model incorporates many of the same factors that will be included in mine, but is limited only to baseball. Additionally, Lewis's measures of "market potential" differ from mine. I am using unemployment rate to measure the effect of economic conditions (namely the 2008 recession) on attendance. Lewis also focuses one model solely on social media, which my regression will not include. Additionally, Lewis has models to measure price elasticity and "win elasticity," which show how much different fans are affected by changes in price or performance on the field. While my model will measure how sensitive attendance rates are to performance on the field, I will not be including pricing factors.

Lewis's study is very similar to mine, except that I will have a much broader focus. I am more concerned with the general fan environment in a city as a whole compared to just individual teams. While Lewis's study would ask which baseball team has the most loyal fans, mine would instead ask which city has the best sports environment in general.

ESPN performs an annual "Ultimate Team Rankings,"[24] which looks to identify which are the best overall teams on a variety of factors and served as the inspiration for this thesis. These rankings look at ticket price affordability, strength of coaching, fan relations, ownership

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[23] Manish, Tripathi. "MLB Fan Analysis Part 1: Fan & Social Media Equity." *Sports Analytics Research from Mike Lewis.*

[24] Keating, Peter. "Ultimate Standings: The Best Franchise in Sports Is ..." *ESPN*

likability, perception of players on and off the field, stadium experience, wins per fan dollar spent ("Bang for the buck"), and championship tendencies. These factors—some quantitative, some qualitative—are ranked across professional baseball, football, basketball, and hockey, in order to create a master list of every team. While this study has a similar goal to mine, I choose to look at factors that are more dependent on the team's location as well as the on-field performance. I am not concerned about the quality of players off the field, or ownership, or coaches, as those should be reflected through championships and the team's win-loss record. My project takes a similar mindset to this ESPN one with a shifted perspective. I want to examine which locations are optimal for teams to play in over a course of many years, not which teams have been most effective over the past year.

IV. Data

The data set was generated completely for the use of my own analysis. This study examines every sports team across professional baseball, football, and basketball over the years 2006 through 2015. By observing this many seasons, I am able to see most teams go through winning and losing cycles, along with a few new stadiums, re-brandings, and even one franchise relocation.

To dilute the effects of differing attendance by sport, my model examines average attendance and percentage capacity as dependent variables. For a sport like football, the low number of home games over the course of a season (typically 8)[25], could lead to much higher attendance figures across the board compared to baseball and basketball. In these two sports, a fan base's loyalty is really tested, with 41[26] and 82[27] home games in basketball and baseball,

[25] Various season encyclopedias used, *Pro-Football-Reference.com.*
[26] Various season encyclopedias used, *Basketball-Reference.com*

respectively. [28] [29] Because of this high number of opportunities to attend games, fan interest could possibly be diluted over the course of a season. Baseball especially can be a good indicator for a city's general excitement over its sports teams. If fans show up to 81 home games even when times are tough, it's a sure sign of a very strong and devoted fan base.

V. **Methodology**

I organized all teams across MLB, NBA, and NFL over a course of 10 years. These teams were grouped together by home city. For two-market cities, I determined home city based on team city identification and true location. So, the San Francisco 49ers were assigned to the city of San Francisco, even though their stadium is in Santa Clara.[30] On the other hand, the Los Angeles Angels of Anaheim were assigned Anaheim as their home city unique from Los Angeles. Additionally, I combined the data for teams in the exact same city market. This occurred in Chicago and New York for baseball, Los Angeles and New York for basketball, and New York for football. I chose not to combine Bay Area teams due to the unique city identifiers in the team names. Many cities, such as Phoenix or Chicago, had multiple teams across the different sports to analyze, whereas others like Green Bay or Salt Lake City only had one. Additionally, my model uses no constant, with the full effect of being in certain markets captured by the coefficient for city dummies.

After creating dummy variables for each city and for each year, I created an array of different variables to measure some on-field and environmental factors that might affect attendance. Descriptions of these variables are as follows:

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[27] Various season encyclopedias used, *Baseball-Reference.com*
[28] Various season encyclopedias used, *Basketball-Reference.com.*
[29] Various season encyclopedias used, *Baseball-Reference.com.*
[30] Various stadium encyclopedias used, *Pro-Football-Reference.com.*

Avg_Attendance: This shows a team's average attendance per game for a given season.[31]

PercCapacity: This shows the percentage capacity on average for a game during a given season. This should help differentiate teams that have stadiums with huge capacities and attract large crowds but don't sellout, from teams with small stadiums that sellout every game.[32]

JuneTemp, OctTemp, and JanTemp: These variables measure average temperature for a team's home city in June, October, and January. This data will be the same for every year per team because I'm not as concerned with small variations in weather as I am with the effect of generally warmer or colder weather on stadium attendance. A city like Phoenix, for example, is roughly the same temperature every year, so I will simply be using the average high temperatures for my chosen months. The hypothesis behind including this data is that warm weather will lead to lower attendance due to the existence of other activities. In warmer cities like San Diego, Miami, and Houston, people can choose to go to the beach, tan outside, or go hiking instead of attending sporting events. On the contrast, cold weather cities like Green Bay, Detroit, and Minneapolis may have fewer activities outside of sports—especially in cold months like January. The reason I chose June, October, and January specifically is because they encapsulate the general temperature variations over the course of the year and specifically correspond with certain sports seasons (October for NFL, June for MLB, and January for NBA). All of these are time invariant.[33]

Baseball, Football, Basketball: These dummy variables show the existence of a sports franchise in each of these respective sports for a given city. Again, the idea is that a city with only one sports team, like Green Bay, will have extremely passionate fans compared to a city with

[31] "NFL Attendance - 2016." ESPN.com. Data for various seasons and sports used.
[32] "NFL Attendance - 2016." ESPN.com. Data for various seasons and sports used.
[33] *US Climate Data*

many sports teams like Los Angeles. Here, the existence of multiple teams could potentially drown out interest in any given team. All of these variables are time invariant.[34]

MetroPopulation: This statistic shows the population of a given metro area. I will be using the population for 2015 in every year. I am not concerned with how marginal yearly population corresponds with attendance. Rather, I'd like to see if larger populations tend to support their teams better or worse than smaller populations. This variable is time invariant.[35] [36]

Comp50: This dummy variable shows the existence of a competitor in the same sport within 50 miles of a given franchise. This is only really relevant for the Bay Area, Los Angeles, Chicago, and New York. The idea here is that two teams sharing one market might again drown out interest in the team that is doing worse or has a worse historical track record. This variable is time invariant.[37]

OtherSportChamp: This dummy variable shows if a city's team in a different sport than the one being currently measured win a championship in a given season. For example, if I am examining the New England Patriots, the dummy would activate if either the Boston Celtics or Red Sox win their championship. I hypothesize that a championship in a different sport will supercharge a fan base's interest on sports in general.[38]

Unemployment: This shows the unemployment rate in a metro area for a given year. In this case, I multiplied the actual unemployment rate (originally in percentage decimal form) by 100. This was in order to measure the effects or one percentage point increase in unemployment rate on attendance. This variable was highly affected by the 2008 recession. My hypothesis is that

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[34] This data was found through referencing within my data set.
[35] "Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2015." *US Census Bureau.* Data from various cities used
[36] "The Canadian Population in 2011: Population Counts and Growth." *Canada Census Program.*
[37] *Google Maps*
[38] "A Complete History of All Major Sports Championship Winners." *A Complete History of All Major Sports Championships*

high unemployment will correspond with higher ticket sales. This is counterintuitive, but has some logical basis--if people have miserable lives, they might be more invested in their sports teams as an escape from reality. Additionally, with high unemployment, people have more free time to follow sports. However, TV ratings may be a better measure of this than attendance.[39]

College: This dummy variable also deals with distraction. If a major "Power 5" conference (PAC-12, SEC, BIG10, ACC, BIG12) college athletics program exists in the same city as a sports franchise, their attendance may suffer. This variable is time invariant.[40]

Preseason: This shows a team's preseason ranking. This subjective data was taken from ESPN. My hypothesis is that a team with high preseason rankings will have excited fans that are more eager to buy tickets than fans of a team whose season is projected to be miserable from the very beginning.[41]

PrevChamp: This dummy variable simply shows whether or not the focus team has won their league's championship in the past season. A championship should lead to an attendance spike in the following season.[42]

WinPerc: This variable shows a team's win percentage in a given season. For this variable, I multiplied the win percentages by 10 to capture the effect of a marginal 10% increase in win percentage on attendance. I am curious to see if win percentage affects ticket sales for the same season, or if its effects are seen further down the road.[43] [44] [45]

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[39] "Unemployment Rate" *FRED Economic Data. St. Louis Federal Reserve*. Data used for various cities.
[40] "Power Five Coaches Polled on Games." *ESPN*
[41] "2015 NFL Power Rankings: Week 1." *ESPN*
[42] "A Complete History of All Major Sports Championship Winners." *A Complete History of All Major Sports Championships*
[43] Various season encyclopedias used, *Pro-Football-Reference.com*
[44] Various season encyclopedias used, *Basketball-Reference.com*
[45] Various season encyclopedias used, *Baseball-Reference.com*

Traffic: This variable measures traffic conditions in a given city. For this dummy variable, the activation queue is a top ten ranking in INRIX 2015 rankings. My hypothesis here is that more traffic congestion will lead to lower attendance, as people would rather stay at home in comfort to watch the game on television than suffer through traffic to attend the game live. This variable is time invariant.[46]

Coast75: This dummy variable activates if the team's host city is located within 75 miles of a coastline. This variable is time invariant.[47]

Stadium_Age: This variable shows how old a team's stadium is. Generally, a newer stadium will be nicer than an old one, and therefore attract more customers. Teams with old, bad stadiums (like the Oakland Raiders and Athletics) should see heavy penalizations through this variable.[48] [49] [50]

Top5Champ: This dummy variable activates if a team is top 5 in the league for overall championships. This variable is time invariant.[51]

Roots: This variable identifies how long any team has been in its current city. This variable is time invariant, as it increases by one for each season the team remains in their current location. It is distinct from *Stadium_Age* because teams can choose to build a new stadium yet stay in the same market.[52] [53] [54]

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[46] "INRIX 2015 Traffic Scorecard - INRIX." INRIX. 2015. Accessed December 04, 2016. http://inrix.com/scorecard
[47] *Google Maps*
[48] Various stadium encyclopedias used, *Pro-Football-Reference.com.*
[49] "Ballparks of Baseball - Your Guide to Major League Baseball Stadiums." *Ballparks of Baseball - Your Guide to Major League Baseball Stadiums.* Data for various ballparks used.
[50] "NBA Arenas." *NBA Hoops Online*. Data for various arenas used.
[51] ^Ibid, *Pro-Football-Reference.com, Basketball-Reference.com, Baseball-Reference.com*
[52] Various season encyclopedias used, *Baseball-Reference.com*
[53] Various season encyclopedias used, *Basketball-Reference.com*
[54] Various season encyclopedias used, *Pro-Football-Reference.com*

AllStar: This variable, only for MLB teams, identifies how many players a team has on the league's all-star roster. For a sport like basketball, one or two superstar players can impact a team in ways it can't in baseball or football. This is due to the size of the team on the field. In basketball, only 5 players are on the court at a time from each team, compared to 9 for baseball and 11 for football. Naturally, a superstar's talent will be diffused over the larger amounts of players for those two sports, while in basketball he can shine. So, I chose to leave out an *allstar* variable in basketball due to a presumed collinearity with win percentage. As a side note, the *allstar* variable was also left out for football due to the wrong specifications. My reasoning for including that variable in baseball was that perhaps fans would have extra motivation to attend games, specifically to see those all-star caliber players. However, the NFL has all-stars at many positions that, in my opinion, were not conducive to attracting fans. While fans may want to come watch a superstar quarterback or running back, they may be less inclined to watch an all-star at an unexciting position like offensive lineman or punter. Therefore, *allstar* was omitted from the basketball and football regressions.[55]

Payroll: Only for MLB, this variable shows what any team's payroll is for a given season. For this variable, I used the team's actual payroll divided by 10,000,000. This way the effect of payroll is more measurable. My model can determine the effect of each marginal 10,000,000 for a team's payroll on attendance. I chose to limit this variable to baseball because it is the only sport without a salary cap.[56] Typically, teams with higher payrolls can afford more talent, but recently there has been a phenomenon of small-market teams winning due to extensive analytics.[57] [58]

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[55] Various team encyclopedias used, *Baseball-Reference.com*
[56] DeMause, Neil. "ESPN.com: Page 2 : Does Baseball Need a Salary Cap?" *ESPN.com:*
[57] ^Ibid.
[58] Lewis, Michael. *Moneyball: The Art of Winning an Unfair Game.*

For my regressions, I eliminated time invariant variables (identified above), knowing that their effects would be captured through the city and year dummies. I performed a fixed effect regression, with a cluster by city. In total, I had six different regressions, individually measuring average attendance and percentage capacity against the gamut of variables, controlling for each of the three professional sports leagues. I chose to run independent regressions for each league because of the varying amount of relative attendance. Football across the board attracted way more fans than either baseball or basketball. For the purposes of this study, I will use my results to identify which regions may be ripe for either a team relocation or an expansion team. While my model cannot predict exactly how well a team will do in any location, it could be a useful tool in determining if certain factors can help a team's chances of having high attendance based on its location or other factors.

For poor performing markets, I will only be using the average attendance model. Since they are not selling out their stadium, the percentage capacity model does not matter. Rather, I am more concerned about the sheer volume of attendance rather than the attendance dependent on their stadium size in these circumstances.

In my analysis, I will highlight the top and bottom 5 performing markets for each specified regression. Then I will pick a few case studies to examine and analyze some of the reasoning behind the results. I will not analyze all top and bottom 5 for each regression, as some cities do not require much in depth case analysis—they just have good or bad fans!

Below is the specified fixed effect model for these regressions:

$$y_{it} = X_{it}\beta + a_i + u_{it} for\ t = 1, \dots 10\ and\ i = 1, \dots 31$$

In this model, y is the dependent variable, for individual i at time t, X is the time variant independent variables. a is the unobserved variables, and u is the error term. We have t = 1

through t = 10 to account for each year in the models, and i =1 through i =28 for baseball basketball, and i =31 for the football regressions. This accounts for the amount of teams in each league, including markets with more than one team.

VI. Results

Baseball

Major League baseball is a 30 team league founded in 1876 with teams ranging all across the US and one in Canada. Each team plays a 162 game season, with 6-7 games per week ranging from April through September. The playoffs are in a best-of-series format in October. Each team typically hosts 81 home games.[59]

Below is my regression output for the baseball average attendance regression.

VARIABLES	(1) avg_attend
unemployment	81.52
	(591.6)
preseason	-115.3**
	(53.88)
otherchamp	1,150
	(862.4)
prevchamp	675.1
	(900.2)
win_perc	2,146***
	(727.7)
allstar	253.2
	(179.7)
payroll	783.8***
	(160.8)
phoenix	9,969
	(6,991)
atlanta	8,859
	(7,525)
baltimore	7,434

[59] "2012–2016 Basic Agreement" (PDF). *Major League Baseball Advanced Media.*

	(6,693)
boston	10,186
	(7,343)
chicago	11,169
	(8,079)
cincinnati	8,017
	(7,502)
cleveland	3,862
	(7,094)
dallas	10,704
	(6,976)
denver	14,577**
	(7,048)
detroit	9,976
	(9,195)
houston	12,789*
	(6,669)
kansas_city	5,380
	(7,082)
miami	4,172
	(6,882)
minneapolis	13,059*
	(6,661)
new_york	13,500
	(7,942)
oakland	3,359
	(7,145)
philadelphia	14,485*
	(7,567)
pittsburgh	7,964
	(7,077)
san_diego	11,556
	(7,297)
san_francisco	17,089**
	(7,605)
seattle	7,279
	(6,942)
st_louis	18,725**
	(7,550)
tampa	1,745
	(7,318)
washington	8,958
	(7,716)
anaheim	15,488*
	(8,425)

los_angeles	18,081**
	(8,568)
milwaukee	15,463**
	(7,196)
toronto	6,822
	(7,629)
yr2006	4,654***
	(1,276)
yr2007	5,730***
	(1,335)
yr2008	4,821***
	(1,170)
yr2009	2,190
	(1,526)
yr2010	1,816
	(2,741)
yr2011	1,699
	(2,380)
yr2012	2,236
	(1,814)
yr2013	1,320
	(1,552)
yr2014	650.1
	(827.6)
Observations	300
R-squared	0.990

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Unemployment rate, other sport championships (*otherchamp)*, and winning a championship in the previous season (*prevchamp)* were statistically insignificant in my model.

For *preseason*, the database I used was entered in inverse, with 1 being the highest ranked team, and 30 being the lowest ranked team. Thus, my data reflects that a better (lower) preseason ranking will affect attendance positively. However, this additional marginal attendance is very small, as the variable coefficient is only -115.

Nonetheless, this effect intuitively makes sense—fans *should* be more fired up to see a higher ranked team going into the season than a lower ranked one. If fans already know that their team will be terrible before the season is even played, why would they want to invest in a season ticket plan? This variable is significant at the 5% level.

A big surprise in this model is *PrevChamp*, I fully expected teams to see a significant attendance boost in the season after winning a championship. It's something I observed directly in my data with the Kansas City Royals, who had a significant attendance boost after making it to the World Series, but losing, in 2014 to the San Francisco Giants. Their attendance grew from, on average, 24,154 to 33,439.

However, the regression output disagrees with my hypothesis, *Prevchamp* turned out to be one of my least significant variables for baseball. Perhaps this insignificant effect can be explained through some collinearity with other variables. Often times, it's easy for sports analysis websites like ESPN to overrate teams that won the most recent championship in their preseason rankings. Perhaps the championship effect can be captured instead through this variable. Also, teams that win championships tend to build up slowly over the course of a few years. Very rarely does a low-ranked team randomly win a championship without a few years of building the team up. A strong draft class usually instigates this growth towards a championship.[60] This can be seen through the San Francisco Giants, who had terrible win percentages from 2006-2008 as they loaded up on high draft picks. With some of these picks, like Buster Posey and Madison Bumgarner, developing out in to MVP-caliber players over the next few years after being drafted, the team's win percentage slowly grew before reaching 2010. In that season, they kicked off a run of 3 championships in the next 5 years.[61] Perhaps the championship attendance boost can instead

[60] Shafer, Jacob. "Giants' Bumgarner-Posey Duo Best MLB Battery in Decades." *Bleacher Report.*
[61] ^Ibid.

be seen as a general increase in attendance over the years of better and better performance leading up to a championship. My next variable, *WinPerc*, measures exactly that effect.

There is a very strong, significant effect on attendance due to a team's win percentage. This variable has a coefficient at 2,145.64 and is significant at the 1% level. The result shows positive effects of winning on attendance. These results were expected. Just as was described in the analysis of *preseason*, fans clearly want to support a winning team. Based on this study, it seems like consistent winning over a long amount of time is really what builds up solid fan bases regardless of a team's location. Therefore, teams should prioritize winning over nearly anything else.

Both *allstar* and *payroll* were insignificant in my study. While these star players can sometimes directly cause an increase in win percentage, this is not always the case. For example, former Cy Young Award winner, Felix Hernandez has pitched for the Seattle Mariners for his entire career. In that time, they have not once made the playoffs.[62] This shows that for baseball, the existence of superstars on a team might not necessarily lead to more winning. Rather, the cohesiveness of the entire team should generate more wins.

Payroll is significant at the 1% level in this regression, with a coefficient of 783.8. This shows that teams with higher payrolls should be able to generate more attendance. These results are consistent with the rest of my model, as high payroll teams should be able to afford better players, and thus generate higher win percentages. Higher payroll teams have, by definition, more engaged fans as their support helps generate more revenue for the team.

The city dummy variables should capture the total effect that being in a certain location has on attendance. Through the invariant factors I listed that were omitted from the regression.

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62 "Felix Hernandez Stats | Baseball-Reference.com." Baseball-Reference.com.

The cities that performed the best are as follows in order of highest coefficient: St. Louis, San Francisco, Los Angeles, Anaheim, and Milwaukee, and.

The surprise here is Milwaukee, whose results are significant at the 5% level. The city does not have a rich baseball tradition. Not only have the Milwaukee Brewers never won a World Series, but they have only made four playoff appearances since their inception in 1970![63] To put that into perspective, over just the course of this study, the St. Louis Cardinals made the playoffs 7 times, winning two championships.[64] This presents a curious case in Milwaukee--why, with a team that consistently is terrible, do the fans keep showing up? While my model was not created to answer this specific question, but rather to identify these oddities in attendance performance, I can merely speculate on the reasons for this phenomenon. Cities in the Midwest region such as Minneapolis, Chicago, and Detroit all tended to do very well in my model. Perhaps this region of the country simply has more engaged baseball fans than other regions.

For California cities, baseball runs deep in the state's culture. With a strong Latin influence in the game, and lots of immigrants, it's understandable why these teams do well.[65] [66] The Dodgers-Giants rivalry is a deep one—dating back to their days in New York competing across the same market. Both teams have been in their current cities since the 1960s,[67] and have seen significant success. Perhaps the intensity of this rivalry is a contributing factor to their strong results.

Markets that performed poorly are as follows in order of lowest coefficient: Tampa, Oakland, Cleveland, Miami, and Toronto. While these dummies have little significance, their

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63 "Milwaukee Brewers Team History & Encyclopedia | Baseball-Reference.com." Baseball-Reference.com.
64 "St. Louis Cardinals Team History & Encyclopedia | Baseball-Reference.com." *Baseball-Reference.com.*
65 "Opening Day Rosters Feature 230 Players Born Outside the U.S." *Major League Baseball.*
66 Lopez, Mark Hugo. "In 2014, Latinos Will Surpass Whites as Largest Racial/ethnic Group in California."
67 Mullin, Brett. "Dodgers-Giants: Baseball's Greatest Rivalry." *Dodgers-giants.*

coefficients are reflective of the attendance trends displayed simply from looking at the data. Some of these cities are very surprising, as Cleveland, Oakland, and Toronto all performed very well in other sports. Speculatively, this could signify a natural affinity for certain sports in these cities over baseball.

Oakland is an extreme juxtaposition to San Francisco, which performed among the best in baseball. To determine why, I must look at the differences between these two teams. While only separated by a few miles,[68] their individual stadium quality is extremely stark. The Oakland Coliseum ranks as one of the worst venues in baseball, while San Francisco's AT&T Park ranks among the best.[69] The Giants also had three championships during the course of this study, while the A's only had a few short-lived playoff appearances. Furthermore, the A's are notorious for trading their good players for prospects,[70] while the Giants tend to keep their high-level players and trade their minor league prospects for major league upgrades.[71] For A's fans, it may be difficult to loyally follow the team if they know their favorite players will probably be gone after a few seasons.

Additional surprises are the poor performances of both Florida teams. Like California, Florida has a strong baseball tradition through a Latin-infused culture.[72] Some of their low attendance could be attributed to a stadium change in 2012. Before this change, their home field was a converted football stadium that was widely regarded as one of the worst in baseball.[73] Constant Miami rainstorms throughout the summer made it difficult to keep fans coming to the ballpark.[74] The new indoor ballpark surely provided a temporary attendance boost, but ultimately

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[68] *Google Maps*
[69] Joseph, Andrew, and Ted Berg. "All 30 MLB Stadiums, Ranked." *USA Today.*
[70] Groenewold, Victoria. "Oakland A's against the World with Strange Strategy." *The Pioneer.*
[71] Shea, John. "Giants' Prospectus / Sabean Makes the Most of Maligned Farm System." *SFGate.*
[72] "Florida Demographic Statistics." *Infoplease.*
[73] Greenburg, Zack O'Malley. "America's Best Baseball Stadiums." *Forbes.*
[74] Jong, Michael. "Can a New Stadium Bring Attendance Relief for the Marlins?" *Marlin Maniac.*

did not solve their problems. A new stadium combined with continual low attendance despite middling win percentages reflects a bad fan base in Miami.

The Tampa Bay Rays are a similar team to the Oakland A's, with a low quality stadium, and a tendency to trade top players after only a few seasons.[75] Through struggles in both Miami and Tampa, perhaps Florida in general is simply a bad state for professional baseball.

Below is my regression output for the baseball percentage capacity model.

VARIABLES	(1) perccapacity
unemployment	0.00207
	(0.0150)
preseason	-0.00238**
	(0.00102)
otherchamp	0.0297
	(0.0203)
prevchamp	0.0132
	(0.0223)
win_perc	0.0493***
	(0.0170)
allstar	0.00285
	(0.00399)
payroll	0.0147***
	(0.00461)
phoenix	0.206
	(0.167)
atlanta	0.177
	(0.182)
baltimore	0.174
	(0.161)
boston	0.437**
	(0.180)
chicago	0.361*
	(0.194)
cincinnati	0.254
	(0.180)
cleveland	0.139
	(0.170)

[75] Bensky, Jake. "What History Tells Us the Rays Should Do at the Trade Deadline." *DRaysBay.*

dallas	0.236
	(0.169)
denver	0.280
	(0.169)
detroit	0.343
	(0.223)
houston	0.373**
	(0.159)
kansas_city	0.214
	(0.169)
miami	0.205
	(0.165)
minneapolis	0.382**
	(0.160)
new_york	0.264
	(0.194)
oakland	0.238
	(0.171)
philadelphia	0.400**
	(0.183)
pittsburgh	0.299*
	(0.170)
san_diego	0.325*
	(0.175)
san_francisco	0.492**
	(0.184)
seattle	0.165
	(0.167)
st_louis	0.485**
	(0.183)
tampa	0.184
	(0.176)
washington	0.277
	(0.185)
anaheim	0.429**
	(0.203)
los_angeles	0.264
	(0.208)
milwaukee	0.437**
	(0.173)
toronto	0.139
	(0.184)
yr2006	0.0624*
	(0.0359)
yr2007	0.0887**

	(0.0348)
yr2008	0.0713**
	(0.0276)
yr2009	0.0238
	(0.0395)
yr2010	0.0199
	(0.0750)
yr2011	0.0264
	(0.0646)
yr2012	0.0383
	(0.0495)
yr2013	0.0177
	(0.0431)
yr2014	0.00886
	(0.0220)
Observations	300
R-squared	0.989

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

For a full analysis of these locations, the percentage of stadium capacity must be examined alongside average attendance. This will filter out teams who may naturally have larger overall stadium capacities than others. By combining the results from both these models, we can get a fairly accurate picture of which cities perform well and which perform poorly. Markets that performed well in this model are as follows in order of highest coefficient: San Francisco, St. Louis, Boston, Milwaukee, and Anaheim. San Francisco, Boston, and St. Louis are no surprise here, as they are all cities with rich baseball history--finishing in the top 5 for overall championships.[76] Milwaukee once again was a surprise as a top performer, cementing its status as one of the strongest fan bases in baseball.

In Southern California, the Angels and Dodgers had different results. The Dodgers finished very well in the average attendance model, but poorly in percentage capacity. The

[76] This was taken from referencing my data set.

Angels finished in the top 5 for both. Perhaps the Angels' strong performance can be attributed to lower distractions in a very similar environment. Weather and employment data for these cities are essentially the same, but Orange County is much more suburban than downtown Los Angeles. In Anaheim, I see the only strong distractors as amusement parks (Disneyland), and the nearby beaches.[77] Whereas in downtown Los Angeles, these distractions are equally as present, but many other factors are added: traffic is much worse,[78] there are two basketball teams located near Dodger Stadium, Hollywood is nearby, along with a variety of other things.[79] While my model cannot say that these are certainly the factors contributing to the Dodgers' poor performance relative to the Angels', I speculate that they may have some effect. Additionally, the Angels consistently finish near the top of ESPN's Ultimate Fan Rankings[80]—which incorporates aspects like ticket prices, player likeability, etc. Perhaps the Angels are simply a better run organization than the Dodgers, leading to these higher attendance performances across the board.

Football

Founded in 1920, the National Football League is currently a 32 team league that plays a 16 game season starting in September and ending in January. Each team plays one game per week, with most occurring on Sundays.[81] Recently, the league has staged a few games per season in London, England as it looks to expand its influence overseas.[82] Besides games that are played in London, each team gets 8 home games per season.

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[77] "The Top 10 Things to Do in Anaheim - TripAdvisor - Anaheim, CA Attractions - Find What to Do Today, This Weekend, or in December." *Trip Advisor.*
[78] Nelson, Laura J. "Downtown L.A. Traffic Is Getting Worse--and to Some, That's Good News." *Los Angeles Times.*
[79] "The Top 10 Things to Do in Los Angeles - TripAdvisor - Los Angeles, CA Attractions - Find What to Do Today, This Weekend, or in December." *Trip Advisor.*
[80] Keating, Peter. "Ultimate Standings: The Best Franchise in Sports Is ..." *ESPN*
[81] Various season encyclopedias used, *Pro-Football-Reference.com*
[82] "NFL International Series - NFL.com." NFL International Series - NFL.com.

Football is a peculiar sport with attendance. Unlike baseball, where attendance discrepancies are hard to avoid in the extensive 81 game home schedule,[83] football teams as a whole draw many more fans than baseball. In fact, the overall average attendance for the NFL in this time period was 68,033, compared to 30,884 for baseball. Football appears to be a more exciting and popular sport in general nationwide. This is seen through the fact that even college football is a huge attendance draw with the University of Michigan's Stadium boasting a maximum capacity over 100,000.[84] As an additional factor, the NFL previously had a rule that would black-out local games on TV if the team did not sellout their tickets.[85] With the existence of this rule, a few teams reported the exact same sellout attendance figures multiple years in a row. Presumably, these figures were accurate, but there is no substantive proof. This blackout rule was suspended on a year-to-year basis beginning in 2015.[86] Additionally, it is difficult to assess true fan loyalty as these attendance figures encapsulate total tickets sold, not the actual number of fans that show up at the game, which is measured in turnstile clicks. Ideally, that would be the perfect measure of fan loyalty. Any fan can buy cheap upper deck tickets and contribute to this "attendance" figure, but when it comes down to actually attending the game, the truly loyal fans are separated from casual ones.

We can see some discrepancies in the attendance figures and the number of fans that actually show up. San Francisco is a perfect example of this. Over the course the study, the 49ers changed stadiums, moving from Candlestick Park just south of San Francisco to Levi's Stadium, located in the heart of Silicon Valley.[87] While their attendance figures at Candlestick and Levi's were strong, a simple visual check of the stands while watching a 49ers home game tells a

[83] Various season encyclopedias used, *Baseball-Reference.com*
[84] "Facilities." *MGOBLUE.COM University of Michigan Official Athletic Site.*
[85] "NFL Continues Suspension of Local TV Blackout Policy for 2016." *Sports Illustrated.*
[86] "NFL Continues Suspension of Local TV Blackout Policy for 2016." *Sports Illustrated.*
[87] "About Levi's® Stadium." *Levi's® Stadium.*

different story.[88] The stadium, with its swanky amenities and technological upgrades has led to higher overall ticket prices.[89] I interviewed Oakland Raiders executive, Mark Shearer, on the current state of Bay Area football—especially with regards to the shifting fan bases over the last few seasons.[90] He claims that because of these prices, some of the more rabid, less wealthy fans have been "gentrified" out of their seats. Their support has been exchanged for a more corporate crowd—who would rather chat with clients at the stadium's wine bar than actually watch the game. Additionally, he says that poor performance on the field, stadium temperature issues, and fan dislike for the team's owner has cost them support over the last couple seasons.[91] So, while they may sell a lot of tickets, their seats still remain largely empty. From a business standpoint, this should be acceptable as long as the team stays profitable. However, if owners prioritize cash flow over winning, it could upset the fan base even further.

Mr. Shearer compared this to the Raiders, whose stadium has a very different vibe from Levi's Stadium. Even though the Raiders have struggled with attendance over the last ten years in ways the 49ers have not, the few fans that attend Raider games are some of the most intense in football. The Oakland Coliseum is well-known for its "Black Hole" area near the south end zone that features especially rowdy fans, many of whom have painted faces and costumes.[92] Even though the Raiders saw little on-field success in the period measured for this study, Mark claims that they relied on these fans to keep them afloat.[93]

As for the 2016-17 season, the Bay Area is seeing a football landscape that it has not experienced since 2002—the Raiders boasting one of the best records in the NFL and the 49ers

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[88] Inman, Cam. "49ers Notes: 'Little Disrespectful' to See so Many Patriots Fans." *The Mercury News.*
[89] Rovell, Darren. "New Home Boosts 49ers' Prices." *ESPN*
[90] Shearer, Mark. Telephone interview by author. October 20, 2016.
[91] Shearer, Mark. Telephone interview by author.
[92] McDonough, John W. "Photos: Oakland Raiders Black Hole Fans." *Sports Illustrated*
[93] Shearer, Mark. Telephone interview by author.

among the worst teams in the league.[94] Even though the 49ers are still selling tickets,[95] their fan base may be losing its footing. In a November 20th game against the New England Patriots, many 49ers players were complaining after the game on how many Patriots fans they saw in the stands.[96] In Mr. Shearer's opinion, many fans are leaving the 49ers, who appear hopelessly lost under current management, for the more exciting Raiders.[97]

Below is the regression for football average attendance.

VARIABLES	(1) avg_attend
unemployment	-807.6
	(563.8)
preseason	-96.13**
	(44.55)
otherchamp	-130.3
	(875.6)
prevchamp	-1,814
	(1,103)
win_perc	-44.86
	(129.4)
phoenix	69,331***
	(3,171)
atlanta	75,894***
	(3,818)
baltimore	76,575***
	(3,113)
boston	73,642***
	(3,519)
buffalo	75,668***
	(3,553)
charlotte	81,075***
	(4,102)
chicago	69,647***
	(4,242)
cincinnati	68,641***
	(3,796)

[94] "NFL Standings: Division." *NFL.com.*
[95] "NFL Attendance - 2016." *ESPN.*
[96] Inman, Cam. "49ers Notes: 'Little Disrespectful' to See so Many Patriots Fans." *The Mercury News.*
[97] Shearer, Mark. Telephone interview by author.

cleveland	76,497***
	(2,969)
dallas	86,550***
	(3,126)
denver	82,145***
	(3,347)
detroit	69,302***
	(4,893)
green_bay	78,359***
	(3,251)
houston	76,914***
	(2,853)
indianapolis	70,382***
	(3,888)
jacksonville	69,357***
	(3,274)
kansas_city	79,869***
	(3,131)
miami	73,347***
	(3,121)
minneapolis	66,293***
	(2,720)
new_orleans	77,582***
	(3,537)
new_york	85,261***
	(3,321)
oakland	61,297***
	(2,897)
philadelphia	74,962***
	(3,449)
pittsburgh	68,447***
	(3,691)
san_diego	71,849***
	(3,847)
san_francisco	75,990***
	(3,258)
seattle	73,597***
	(3,283)
st_louis	65,009***
	(3,094)
tampa	67,387***
	(3,436)
nashville	75,106***
	(2,993)
washington	89,659***

	(3,674)
yr2006	-142.2
	(1,615)
yr2007	-315.5
	(1,699)
yr2008	-516.3
	(1,532)
yr2009	1,125
	(1,524)
yr2010	2,179
	(2,453)
yr2011	1,969
	(1,988)
yr2012	1,412
	(1,537)
yr2013	1,891
	(1,249)
yr2014	988.6
	(626.6)
Observations	320
R-squared	0.998

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

For the average attendance model, only *preseason* had significance among the non-dummy variables. It had a small effect though, with a coefficient of -96 (remember, *preseason* was entered in inverse), significant at the 5% level. The surprise in this model was win percentage, which despite being very significant for my baseball and basketball models, had a nearly insignificant effect on the football model. This reflects how loyal football fans are in general. Seemingly, even a bad team on the field will not stop them from coming out to the stadium.

Since these time variant factors were so irrelevant across the board, I can attribute a fair amount of the variation in the city dummies to the time invariant data. Similar to the baseball model, this analysis is not complete without integrating the results from the percentage capacity

model. This is especially prevalent in football, where stadium size can vary immensely. The largest stadium, MetLife Stadium in New York, boasts a capacity around 82,500. This dwarfs the lowest capacity stadium, the Oakland Coliseum, which can hold around 56,000 fans.[98] The top 6 ranked stadiums in capacity all were among the top performers in the average attendance model. So, for football I will focus mostly on the percentage capacity model to determine the top performing markets. The results for this model are located below.

VARIABLES	(1) perccapacity
unemployment	-0.00609
	(0.00499)
preseason	-0.00131**
	(0.000519)
otherchamp	-0.00705
	(0.0153)
prevchamp	-0.115
	(0.0996)
win_perc	-0.000252
	(0.00220)
phoenix	1.046***
	(0.0346)
atlanta	1.031***
	(0.0378)
baltimore	1.065***
	(0.0357)
boston	1.050***
	(0.0398)
buffalo	0.998***
	(0.0394)
charlotte	1.064***
	(0.0411)
chicago	1.059***
	(0.0407)
cincinnati	1.003***
	(0.0377)
cleveland	1.019***
	(0.0363)
dallas	1.068***

[98] Various stadium encyclopedias used, *Pro-Football-Reference.com*

	(0.0319)
denver	1.053***
	(0.0338)
detroit	1.009***
	(0.0484)
green_bay	1.095***
	(0.0366)
houston	1.059***
	(0.0311)
indianapolis	1.014***
	(0.0403)
jacksonville	0.996***
	(0.0358)
kansas_city	1.009***
	(0.0358)
miami	0.962***
	(0.0363)
minneapolis	1.036***
	(0.0307)
new_orleans	1.033***
	(0.0386)
new_york	1.035***
	(0.0396)
oakland	0.950***
	(0.0362)
philadelphia	1.076***
	(0.0338)
pittsburgh	1.028***
	(0.0452)
san_diego	0.975***
	(0.0363)
san_francisco	1.055***
	(0.0369)
seattle	1.073***
	(0.0366)
st_louis	0.953***
	(0.0367)
tampa	0.982***
	(0.0370)
nashville	1.060***
	(0.0338)
washington	1.015***
	(0.0385)
yr2006	0.0270*
	(0.0145)

yr2007	-0.00345
	(0.0326)
yr2008	-0.000272
	(0.0117)
yr2009	0.00123
	(0.0201)
yr2010	0.00441
	(0.0276)
yr2011	0.00647
	(0.0247)
yr2012	0.00695
	(0.0219)
yr2013	0.0120
	(0.0186)
yr2014	0.00581
	(0.00841)
Observations	320
R-squared	0.996

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The NFL in general finished with very strong percentage capacity results. All but 7 teams had coefficients over 1, which corresponds to more than a sellout. Additionally, all city dummies had significance at the 1% level. The top football markets by percentage capacity are as follows in order of highest coefficient: Green Bay, Philadelphia, Seattle, Dallas, and Baltimore.

This is striking in its opposition to the baseball model's results. The Seattle Mariners and Baltimore Orioles finished very average in both baseball models, yet for football, their markets are in the top 3. Seattle in particular is intriguing, as their basketball support was so poor that the Super Sonics moved to Oklahoma City in 2008,[99] in addition to poor results for baseball. In a city that seems to have such a strong dislike for professional sports, why do the Seahawks do so well? My assumption is the on-field success seen over the period measured in this model, as well as excellent marketing and branding by the Seahawks' is the reason. The team has emphasized the

[99] Aldridge, David. "NBA.com: Two Years Later, Pain of Losing Sonics Still Stings Seattle." *NBA.com.*

idea of the crowd being the "12th Man"—with 11 players on the field, and the deafening crowd noise representing one extra man. The Seahawks' marketing team really pushes this, flying "12th Man" flags at their games, and selling "12th Man" jerseys at team stores.[100] With crowd noise as such a source of pride for the team, it's no surprise that they sport one of the strongest home field advantages in the NFL and sell so many tickets.

The baseball Seattle Mariners sport one of the longest playoff droughts in baseball, having not been to the postseason since their record-breaking 116-win season in 2001--where they were ironically eliminated in the first round.[101] With such sustained mediocracy, what is there for fans to get excited about? Especially when a football team that appeared in three Super Bowls and won one over the past ten years[102] is located right across the street, one can understand the attendance discrepancy between these two teams. In my mind, this signifies a bad city-wide fan base.

Green Bay is also peculiar, as it is very close geographically to Milwaukee, which was the star performer of the baseball models. The Green Bay Packers have a unique situation, being the only team in a relatively small northern town. As a historic, successful franchise with a deep fan base,[103] these Packers command the strongest support in the league.[104] They are essentially the pride of their town. While nearby Chicago has 4 total sports teams measured in my models as well as many other sources of city pride, Green Bay on a national level only has the Packers. To me, deeply rooted feelings are impervious to any sort of outside factor my model might measure. The Packers really have an ideal situation with an indestructible fan base that, in my opinion,

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[100] "The 12s." *Seattle Seahawks.*
[101] "2001 Seattle Mariners Batting, Pitching, & Fielding Statistics," *Baseball-Reference.com*
[102] "Seattle Seahawks Team Encyclopedia," *Pro-Football-Reference.com*
[103] This was taken from my data set.
[104] "Packers Fans Declared NFL's Best by Forbes." *ESPN*

cannot be replicated with a modern expansion or relocation team. That is, unless they experience the same success over a long period of time that the Packers have enjoyed.[105]

One surprising result is Cleveland, which I expected to perform badly in this model. It was one of the worst performing cities in my baseball model, and with a Cleveland Browns team that didn't have a high preseason rankings or win percentage in my data set, I expected low attendance. However, this was not the case. I initially thought that this could be due to the historical track record of the Browns—with professional football existing in Cleveland since the 1940s.[106] However, after some research, I realized the Browns have a very peculiar history that could void this notion. The current Browns team was actually a 1998 expansion franchise, as the city had no professional football from 1996 to 1998.[107] The original Cleveland Browns from the 1940s became the Baltimore Ravens in 1996.[108] So, these shuffling teams could have had some unseen effects on their attendance. However, with the expansion franchise adopting the same team name and uniforms as the original Browns, perhaps the original fan base found it easy to follow their new team.

The poorest performers in the percentage capacity model are, in order: Oakland, St. Louis, Miami, San Diego, and Tampa. Instantly what pops out with these results are the southern locations of these teams. All of these teams are located in warm weather locations near coastlines (with St. Louis as the only outlier in that circumstance). These results were surprising, especially considering how well some warm weather cities like Dallas and Atlanta performed in this regression. However, many of these teams have indoor stadiums, which help shelter fans from sweltering heat at the beginning of the season.[109] Warm weather during the NFL season in winter

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[105] "Green Bay Packers Team Encyclopedia," *Pro-Football-Reference.com*
[106] "Cleveland Browns Team Encyclopedia," *Pro-Football-Reference.com*
[107] ^Ibid
[108] ^Ibid.
[109] Various team encyclopedias used, *Pro-Football-Reference.com*

months should have some impact on fans' willingness to sit outside at a stadium for three to four hours, but the data shows that it does not. Cold weather cities in general performed better. Due to my model, I cannot assume that warm weather teams automatically do worse in attracting football fans, despite some sort of pattern existing.

Oakland, San Diego, and St. Louis are all notorious for poor quality stadiums. Perhaps their stadiums could be a major factor behind the decline.[110] The struggles for these teams have been well documented, as the Oakland Raiders and San Diego Chargers have been lobbying over the last few years for new stadiums from their current home cities.[111] [112] However, these efforts have been met with some backlash. Looking to maximize attendance elsewhere, all three of these teams were involved in major relocation talks in the offseason after the 2015-16 season. They envied the untapped Los Angeles market.[113] At some point in their history, all three called Los Angeles home,[114]and could have been hoping to capitalize on their residual fan bases in the city. Ultimately, the St. Louis Rams were the only team granted permission by the league to relocate.[115]So far, their move has turned out fairly well. According to ESPN, they rank near the top of the league in average attendance with 74,121 per game, but this translates to only 89.8% capacity in the carnivorous Los Angeles Memorial Coliseum.[116] Still, this is around 20,000 more fans on average per game than they were seeing last season. With a brand new stadium in Inglewood in the works for the next few seasons the Rams' future looks bright.[117]

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[110] Chase, Chris. "Ranking the Best and Worst NFL Stadiums, from No. 1 (Lambeau) to 31 (Soldier)." *USA Today.*
[111] Purdy, Mark. "Purdy: Raiders and A's Stadium Talks in Oakland Need Transparency, Not Mystery." *The Mercury News.*
[112] Belson, Ken. "San Diego Voters Reject Funding of New Chargers Stadium." *The New York Times.*
[113] Staff. "Rams, Chargers, Raiders Apply for L.A. Relocation." *NFL.com.*
[114] Various team encyclopedias used, *Pro-Football-Reference.com*
[115] "Rams Headed Back to Los Angeles, Chargers Have Option to Join." *ESPN*
[116] "NFL Attendance – 2016," *ESPN*
[117] "Kroenke, Goodell Break Ground on Rams' Inglewood Stadium." *AJC.*

The Raiders, on the other hand, have had a difficult time trying to find a long-term stadium solution. In my opinion, any team would prefer to stay in their current location, given they could find funding for a new stadium. This is due to an existing foundation of fans. By moving to a new city, they have to develop a completely new fan base, which is presumably an expensive and tireless project. After losing out on the Los Angeles market to the Rams, and with seemingly no solid plan moving forward in Oakland, the Raiders have begun looking outside of California. Among flirting with a move to San Antonio, Texas, the most enticing relocation city is Las Vegas, Nevada.[118] This city presents an interesting opportunity unseen in most other markets. Historically, the legalized gambling within the city seems to contradict with professional sports. Leagues would not want a scenario where a player or coach were to legally bet on their team to win or lose, and for this betting to potentially impact the outcome of the game.[119] However, as a city of substantial size with a metro area population of over 2,000,000,[120] and only a newly formed professional hockey team, the city appears to be a great market for expansion or relocation.[121] With the shifting tide of fans in the Bay Area as described by Mr. Shearer, perhaps the Raiders will change their mind on these other locations and focus all their efforts on staying in Oakland to capitalize on new fans.[122]

Regionally speaking, it appears difficult to make any sort of prediction how well a team in the Southwest will do. This is because Phoenix is the only similar market analyzed in my model. Support for football in Phoenix was fairly average, as it hovered around 100% capacity. As documented earlier though, warm weather cities tended to perform worse in my models. Most of these cities were all close to coastlines, which Phoenix is not. Additionally, Phoenix performed

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[118] Murphy, Austin. "The Raiders' Rabid Fans Finally Have a Team to Get Behind...but for How Long?" *Sports Illustrated.*
[119] Belson, Ken. "Raiders Owner Says He Is Firm on Moving Team to Las Vegas." *The New York Times.*
[120] "Population-2015." *Las Vegas Convention and Visitors Authority.*
[121] Beachem, Gren "AP Source: NHL Settles on Las Vegas for Expansion." *The Big Story*
[122] Shearer, Mark. Phone interview with author.

poorly for baseball and basketball, and recently came under fire for poor support of its NHL team.[123] Perhaps this is an indication that cities similar to Phoenix also have poor sports marketing environments. Whereas my model could suggest a southwestern city like Albuquerque, NM might be a poor option for relocation, there are simply too many other variables with Las Vegas to even begin to predict how attractive of a market it is.

Basketball

The National Basketball Association is a 30 team league with franchises all across the United States and one in Canada. Typically, they have an 82 game season ranging from late October to April. Each team has 41 home games, and plays 3 to 4 games per week. The NBA was created in 1946, and merged with the rival American Basketball Association (ABA) in 1976 to arrive at its current state.[124] [125]

Below is the regression output for the basketball average attendance model.

VARIABLES	(1) avg_attend
unemployment	128.7
	(86.86)
preseason	-70.80***
	(17.85)
otherchamp	-233.7
	(257.2)
prevchamp	-449.0**
	(208.3)
win_perc	178.0***
	(60.41)
phoenix	16,941***
	(720.3)

[123] Grigsby, William. "Arizona Coyotes: Attendance Numbers Are Not Great." *Howlin' Hockey.*
[124] "2014-15 NBA Season Summary," *Basketball-Reference.com*
[125] Miller, Bret. "American Basketball Association." *Sports Team History - Sports Team History.*

atlanta	15,737***
	(807.9)
boston	17,861***
	(669.1)
charlotte	16,179***
	(896.8)
chicago	20,820***
	(806.4)
cleveland	18,981***
	(733.6)
dallas	19,460***
	(663.7)
denver	16,490***
	(726.4)
detroit	17,432***
	(968.4)
houston	16,578***
	(664.0)
indianapolis	14,941***
	(770.4)
miami	18,724***
	(677.2)
minneapolis	16,064***
	(688.9)
new_orleans	15,672***
	(718.8)
new_york	17,848***
	(741.3)
oakland	18,805***
	(726.2)
philadelphia	15,700***
	(749.9)
seattle	15,566***
	(777.9)
washington	17,235***
	(790.2)
los_angeles	18,024***
	(807.5)
milwaukee	15,446***
	(761.9)
toronto	18,317***
	(811.8)
memphis	14,622***
	(783.8)
okc	18,014***

	(583.2)
orlando	17,307***
	(761.4)
portland	19,468***
	(826.1)
sacramento	15,469***
	(914.3)
san_antonio	17,443***
	(626.1)
salt_lake	19,294***
	(617.9)
yr2006	69.70
	(290.5)
yr2007	-244.3
	(349.7)
yr2008	-238.9
	(361.1)
yr2009	-990.4***
	(283.7)
yr2010	-1,056***
	(353.5)
yr2011	-1,176***
	(417.9)
yr2012	-871.9***
	(297.0)
yr2013	-753.9***
	(252.9)
yr2014	-176.0
	(146.2)
Observations	300
R-squared	0.997

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The city dummies all are significant at the 1% level. Additionally, the basketball average attendance model is much easier to interpret than the football one because of stadium capacities. In the NFL, stadium sizes can have a range of roughly 30,000 marginal seats. For basketball,

arenas held between 20,917 (United Center in Chicago) to 16,867 (Smoothie King Center in New Orleans)—a range of merely a few thousand.[126]

Unemployment seemed to have an loosely inverse relationship with basketball attendance. However, the variable is not statistically significant.

For *preseason*, I see results as expected—higher team preseason rankings correspond with a positive bump in attendance, significant at the 1% level. As with football, this attendance boost was small, with the confidence interval ranging from 34 to 107. In the context of a game with tens of thousands of fans, this extra attendance is barely significant.

The *otherchamp* variable was not significant in the average attendance regression.

Prevchamp had a negative correlation with attendance and is significant at the 5% level, which is very surprising. One would expect that winning a championship would help create more fans, not lose them. Despite the seeming logical contradiction, the loss of attendance was quite small, with a coefficient at -448.99.

With the other variables returning surprising results, *winperc* was exactly as I expected and significant at the 1% level. As I hypothesized in the beginning, fans want to watch and support a winning team, and my findings in this model only further support that hypothesis.

The basketball model is unique in that it had a relocation over the course of the study. In 2008, the Seattle Super Sonics became the Oklahoma City Thunder.[127] It was interesting that the team's ownership chose Oklahoma City specifically because it did not have another professional team in any major sport—hockey and soccer included. The ownership group that bought the Super Sonics in 2006 apparently had always intended to move the team to Oklahoma City,

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[126] "Official National Basketball Association Guide 2014-15" (PDF). *National Basketball Association.*
[127] "Oklahoma City Thunder Team Encyclopedia," *Basketball-Reference.com*

viewing Seattle as a "lame duck" location.[128] Perhaps this was due to the arena—but Seattle fans simply failed to support the team. My model, which encapsulates the franchise's final two seasons in Seattle, shows them with an awful fan base. Clearly the cross-country move was a good one from an attendance standpoint as my data set shows they saw a huge attendance boost in their new home.

For the city dummies, the average attendance model returned some results that were different from the baseball or football model. The star cities here are as follows, in order by coefficient: Chicago, Dallas, Portland, Salt Lake City, and Cleveland.

Upon first glance, I hypothesized that the strong results for Portland and Salt Lake City were due to their teams' status as the "only show in town"—meaning that they're the only professional sports teams in their respective market. I imagined this would lead to stronger support across the board. However, other markets with this same scenario like San Antonio, Sacramento, Memphis, and Orlando failed to replicate these successes. In fact, despite having a very successful team on the court over the course of this study, San Antonio defied the model with its poor attendance performance.

Most of the locations that did well in this regression struggled in my other regressions, especially Oakland, which finished in the very bottom for both baseball and football. As a caveat, Oakland presents a unique situation for the basketball model. For the other two sports, Oakland has a direct competitor just across the bay in San Francisco to carve into its fan base. In basketball, the Golden State Warriors are the only team for the entire Bay Area.[129] Therefore, their fan base can reach areas that are split in the other two sports. This gives them a unique advantage that can only be mirrored by the Chicago Bulls--also a single team in a potentially two-team market. This combined with a history of championships, mostly in the 1990s led by Michael

[128] Farmer, Sam. "How the Sonics Became the Thunder: A Timeline." *Los Angeles Times.*
[129] He, Eric. "Are the Golden State Warriors Really "The Bay's Team"?" *Blue Man Hoop.*

Jordan, could account for their success in my model.[130] Despite results that could be affected by their arena size, the Bulls' strong performance in the percentage capacity regression only further cements their status as one of the best supported teams in the league.

Cleveland is a particularly intriguing market for this study due to the presence of hometown superstar, LeBron James. The success he has brought to his teams almost deserves a control or dummy variable of its own in my regression. James was a member of the Cleveland Cavaliers twice, from 2003-2009 and from 2014-present. In his first stint, the Cavaliers made the playoffs 5 times consecutively from 2005-2009. In the four seasons he was gone, the team finished in 15th, 13th, 13th, and 10th out of 16. Upon his return, LeBron led the Cavaliers immediately to the NBA finals in the next two consecutive seasons. Clearly, his presence had a significant impact on the team's performance, and therefore, its attendance.[131]

James did not only affect Cleveland, as his influence was also seen in the Miami Heat. He led the Heat to the NBA Championship all four seasons he was there, winning two titles.[132] This immense success was one of the reasons I chose to leave a superstar or all-star variable out of the basketball model

Markets that performed poorly in the average capacity basketball model are as follows in order: Indianapolis, Milwaukee, Sacramento, New Orleans, and Philadelphia. Of these teams, Philadelphia, Milwaukee, and Sacramento's teams posted extremely low win percentages, which may be a major factor in their struggling attendance. Both Philadelphia and Milwaukee scored highly in the football and baseball regressions (if I include Green Bay as representative of Milwaukee). For these markets, perhaps their other teams performing so well acted as a distraction from poor play on the basketball court. Even though this regression suggested that

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[130] "Chicago Bulls Team Encyclopedia," *Basketball-Reference.com*
[131] "LeBron James Stats," *Basketball-Reference.com*
[132] "Miami Heat Team Encyclopedia," *Basketball-Reference.com*

other sport championships in these markets had a minimal effect on attendance, it did not account for other sport win percentage.

The league recently almost moved the Sacramento Kings to Seattle, but a last second pitch from a Sacramento ownership group kept them home[133] With this group negotiating a deal for a brand new arena, which opened for the 2016-17 season, the Kings are all but ensured of staying for the time being.[134] But, why would the league be so motivated to keep a struggling franchise in their current location? Yes, there have been documented instances of a new stadium corresponding with positive attendance rates according to my data set (ex. Miami Marlins in 2012). But, I assume the league would prefer to put this new stadium in a city which has proven it can at very least support one team (the Seahawks) over a city like Sacramento which has not provided good attendance to its only team. Although, caution over Seattle is necessary, especially given their results in the model.

Indianapolis's poor showing is surprising as the city supported its football team very well. Additionally, "the Hoosier State" as a whole is known for its rabid basketball culture, mostly centered around the University of Indiana's team and a very popular statewide high school tournament.[135] Perhaps this could be the reason for the poor support for professional basketball. Since college and professional basketball play their season over roughly the same course of months, perhaps Indianapolis residents are more interested in the Hoosiers and high school basketball than they are the NBA's Pacers.

Over the course of this study, New Orleans teams struggled with destruction from Hurricane Katrina. The storm's damage forced them to play some games outside of New

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[133] Wojnarowski, Adrian. "Sources: Kings to Play in Seattle next Season." *Yahoo! News.*
[134] "Kings Open New Arena." *NBA.com.*
[135] Jones, Norman. *Growing up in Indiana: The Culture & Hoosier Hysteria Revisited.*

Orleans.[136] With the condition of devastation some of the team's fans were left in after the hurricane, perhaps basketball was the least of their concerns. Additionally, the team went through a rebranding over the period of time studied in this regression. Through 2012, they were known as the New Orleans Hornets, having relocated from Charlotte in 2002.[137] Despite the city change, they chose to retain their Hornet mascot. In 2013, owners renamed the team, choosing a Pelican mascot that had more cultural identification with New Orleans.[138] After this rebrand, attendance rose sharply by roughly 3,000 fans.[139] In fact, in the final three years of this study, New Orleans finished with very high capacity numbers. With all these extreme outside factors, I think New Orleans poor result is not necessary related to the city's sports market and a relocation is not advised.

As an additional factor in this regression, the NBA had a temporary lock-out in the 2011-12 season.[140] This lockout limited teams to a 66 game season, compared to the normal 82 game season.[141] When creating the data set, I was curious to see if this lockout would either result in lower attendance from frustrated fans or higher attendance from fans wanting to capitalize on fewer chances to see their home team play. It turned out to be the former, as 2011 saw the lowest mean of any year dummy variable. With the current collective bargaining agreement set to expire in 2017, these figures should motivate the league to avoid another lockout.[142]

The results for the basketball percentage capacity model are below:

VARIABLES	(1) perccapacity
unemployment	0.00607

[136] Adande, J.A. "Adande: Katrina's Effect on Four NBA Cities." *ESPN*
[137] "New Orleans Pelicans Team Encyclopedia," *Basketball-Reference.com*
[138] "Hornets Announce Name Change to Pelicans." *ESPN*
[139] This information was found in my data set.
[140] Thompson, Derek. "The NBA Lockout: Here's What You Need to Know." *The Atlantic.*
[141] "2011-12 NBA Season Summary," *Basketball-Reference.com*
[142] Heisler, Mark. "NBA Lockout of 2017: Riches or No Riches, Get R-R-Ready to Rumble!" *Forbes.*

	(0.00485)
preseason	-0.00382***
	(0.000901)
otherchamp	-0.0182
	(0.0140)
prevchamp	-0.0256**
	(0.0110)
win_perc	0.00954***
	(0.00311)
phoenix	0.930***
	(0.0405)
atlanta	0.849***
	(0.0456)
boston	0.967***
	(0.0374)
charlotte	0.857***
	(0.0502)
chicago	0.998***
	(0.0460)
cleveland	0.929***
	(0.0414)
dallas	1.019***
	(0.0374)
denver	0.867***
	(0.0408)
detroit	0.881***
	(0.0550)
houston	0.925***
	(0.0373)
indianapolis	0.842***
	(0.0433)
miami	0.961***
	(0.0384)
minneapolis	0.838***
	(0.0380)
new_orleans	0.937***
	(0.0404)
new_york	0.933***
	(0.0413)
oakland	0.968***
	(0.0407)
philadelphia	0.738***
	(0.0417)
seattle	0.424***
	(0.0421)

washington	0.859***
	(0.0446)
los_angeles	0.955***
	(0.0459)
milwaukee	0.832***
	(0.0426)
toronto	0.933***
	(0.0458)
memphis	0.815***
	(0.0443)
okc	0.994***
	(0.0321)
orlando	0.954***
	(0.0430)
portland	0.987***
	(0.0466)
sacramento	0.900***
	(0.0513)
san_antonio	0.942***
	(0.0351)
salt_lake	0.974***
	(0.0340)
yr2006	-0.00140
	(0.0160)
yr2007	-0.0173
	(0.0189)
yr2008	-0.0167
	(0.0194)
yr2009	-0.0534***
	(0.0153)
yr2010	-0.0565**
	(0.0207)
yr2011	-0.0639**
	(0.0236)
yr2012	-0.0451**
	(0.0166)
yr2013	-0.0377***
	(0.0132)
yr2014	-0.00861
	(0.00741)
Observations	300
R-squared	0.997

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The top performers in this regression are as follows in order: Dallas, Chicago, Oklahoma City, Portland, and Salt Lake City. Clearly, these results are consistent with my average attendance model.

Dallas performed far above the other four top markets. The city performed very well in both the basketball and football models, yet it lagged for baseball. My hypothesis is that this has to do with temperature. In Dallas, the Cowboys (football) and Mavericks (basketball) play at indoor arenas.[143] [144] The Rangers (baseball), on the other hand, play at an outdoor stadium.[145] Temperatures in July for this area average at a high of 95 degrees Fahrenheit.[146] So, Rangers fans have a big decision when it comes to watching their team compete over the summer months. Either go to the game and roast under the hot Texas sun, or watch the game at an air-conditioned bar or at home. Given these extreme conditions and the results from my regression, it seems like most choose the air conditioning. Comparatively, other MLB stadiums in hot, southern cities like Phoenix or Houston, are generally indoors[147]The only outdoor stadium that comes close to the same environment as Dallas is Atlanta,[148] which also struggled with attendance in the baseball regressions. While my models include temperature as a variable, they are time invariant, so their effects show up in the city dummy variables for the regression output. In order to fully determine whether or not temperature is the true factor for these attendance discrepancies in Dallas a further model is needed.

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[143] "Dallas Cowboys Team Encyclopedia," *Pro-Football-Reference.com*
[144] "Dallas Mavericks Team Encyclopedia," *Basketball-Reference.com*
[145] "Texas Rangers Team Encyclopedia," *Baseball-Reference.com*
[146] *US Climate Data*
[147] *Ballparks of Baseball – Your Guide to Major League Baseball Stadiums*
[148] Ibid.

Dallas is one of the most consistently markets for attendance across all sports. It certainly helps that all 3 of their teams posted solid win percentages over the course of my study, but nonetheless their fans seem to support their teams very well.

The most surprising result to me was Los Angeles and New York. As two huge US cities,[149] I expected their basketball attendance to be fantastic. Instead, they were very middling. Perhaps this lack of attendance is due to both cities having two teams, with the Lakers and Clippers calling Los Angeles home and the Nets and Knicks residing in New York.[150] This could spell trouble for the Warriors or Bulls if the NBA looks to expand a second team into their markets, which have multiple teams in other sports.[151]

VII. Shortcomings

In some ways, my regressions fell short of their initial goal—to determine the best and worst possible sports market for professional teams to look to relocate to or for leagues to expand into. These shortcomings were mostly due to lack of publicly available information. Ideally, I would have used attendance, jersey sales, TV ratings, turnstile clicks, and other measures of fan interest over the past ten years as many dependent variables across multiple regressions. However, most of this information is unavailable to the public. The most useful of these would be turnstile clicks. My attendance figures only measured the amount of tickets sold for each game. A team can sell out a game, but still have hundreds of empty seats if people don't show up. To me, filling the seats is the best measure of true fan loyalty and support.

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[149] *United States Census Bureau*
[150] Various Team Encyclopedias Uses, *Basketball Reference.com*
[151] This information was found in my data set.

Another area where I struggled to find information was in some of my independent variables. Toronto, for example, had climate and unemployment data on different servers than US cities. For Toronto, I chose to use the unemployment rates and weather data for nearby Buffalo, NY, which I see as a similar city to Toronto, but obviously the data is not exactly accurate.

My study did not include professional hockey or soccer. This was deliberate, as hockey has a much more Northern market than baseball, football, and basketball. Not only is it located in many US cities that do not have any other major sports teams (ex. Columbus, OH, Newark, NJ), but it has 7 teams located in Canada.[152] This is compared to baseball and basketball who each have one team in Toronto and football, which has no international teams. Major League Soccer is by far a less popular sport in the US than baseball, football, and basketball.[153] However, including these teams' attendance rates could have provided my regressions with a more complete scope of a city's sports environment.

Despite these fallbacks, my study does have the ability to capture which teams have the most and least supportive fan bases. When these results are combined across different sports in the same market, my regression can make solid inferences on these markets' quality.

VIII. Relocation or Expansion Recommendation

Baseball

By combining all results from my study, a few markets performed consistently strong across the board. Most of these markets were characterized by large populations and a history of

[152] "2015-16 NHL Season Summary," *Hockey-Reference.com*
[153] Cassidy, John. "How Far Can Soccer Go in the U.S.A.?" *The New Yorker.*

success on the field. Despite win percentage being insignificant in the football regressions, winning seems to be a major factor in determining how much support a team will receive in the other two sports.

For baseball, some of the best performers are concentrated in the Midwest, with Milwaukee, St. Louis, Chicago, Detroit, and Minneapolis. A significant open market near this region is Louisville, Kentucky. As a market with no other sport competition and the home site for one of the world's largest baseball bat manufacturers (Louisville Slugger), Louisville is an intriguing option.[154] Their minor league team, the Louisville Bats, is one of the top minor league teams for attendance.[155] Perhaps this could result in strong MLB attendance as well.

Even though some of the strongest performers were located on the West Coast, the poor rankings of markets like Phoenix, Seattle, and Oakland drag the region down. Seattle and Phoenix are all relatively newly formed teams[156] that didn't post high win percentages in my data set.

The Northwest specifically has been one of the worst regions for baseball across more than just the major league level. Alongside Seattle finishing near the bottom of my model, the former minor league team in Portland, Oregon drew attendance figures so low that they were forced to relocate.[157]

I recommend the Tampa Bay Rays as the team most in need of relocation. Given how unsuccessful the Miami Marlins new stadium has been, I think a full city move is necessary for this franchise to fix attendance issues instead of a new stadium in Tampa.

Additionally, the Oakland A's should look to relocate. Unlike other poor performers on the West Coast, the A's are traditionally a strong baseball franchise, finishing in the top 5 for

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[154] "Louisville Slugger Museum & Factory." *Louisville Slugger Museum & Factory.*
[155] "Minor League Attendance Leaders Are Lehigh Valley, Louisville, and Columbus." *Pardon Our Interruption.*
[156] Various team encyclopedias used, *Baseball-Reference.com*
[157] Brown, Maury. "The Death of Baseball in Portland | FanGraphs Baseball." *FanGraphs Baseball.*

overall championships.[158] With these factors seemingly working for them and still struggling attendance rates, perhaps the A's should pivot their market away from the San Francisco-dominated Bay Area and into their own unique city.

Football

Football teams scored very well across the board, with even the worst performers still returning strong attendance rates relative to every team across all three sports. With success in small cities and large cities alike, it appears that football has the most opportunity, but lowest need, for expansion or relocation.

For my recommendation, it appears that Northern cities tended to perform better across the board than southern ones. There are some obvious outliers like Dallas, which has its own tradition of success and grandeur, that defy this tendency.[159] My initial targets following this philosophy would be Portland, Oregon and Salt Lake City, Utah. Portland is attractive due to its strong support of NBA basketball and the success of the nearby Seattle Seahawks. As a very similar city culturally to Portland, Seattle could provide a football marketing model for Portland could attempt to emulate.

Salt Lake City's draw feeds off the neighboring city of Denver. While Denver showed middling support for baseball and poor support for basketball, it did very well in football. Perhaps this support has piggybacked off the success of the Denver Broncos in the 1990s and very recently.[160] Or, perhaps the region has a natural affinity for football. Salt Lake City has also

[158] Various season information used, *Baseball-Reference.com*
[159] Ward, Arden. "Joe Nick Patoski on The Dallas Cowboys: Uncovering the History of "America's Team"" *CultureMap Austin.*
[160] "Denver Broncos Team Encyclopedia," *Pro-Football-Reference.com*

shown strong support for its basketball team, so it could prove to be an attractive location for football.

Teams could also look to the Southeast region for potential relocations, but it brings its own gamut of other issues to sort through. Not only are there more professional football teams in this region to carve into a new team's potential fan base, but the prevalence of college sports is also extremely strong. My model has a *college* variable that accounts for these schools, but the support different schools receive can vary a lot based on region—with the Southeast sporting the strongest fan bases. For example, in a study performed by ticketcity.com, 6 SEC (South Eastern Conference) schools received higher fan engagement scores than the top PAC-12 (Pacific Athletic Conference) school.[161] So, not only would an expansion/relocation NFL team have to compete with existing professional teams in the region, they would also have to compete with the intense, deeply-rooted college atmosphere.[162] Perhaps this could prove to not be a factor though, as Nashville finished with very strong results in the football regressions, despite being home to SEC member Vanderbilt University.[163]

Overall, no football team showed small enough support to warrant a full relocation. In my opinion, the lowest performing teams—San Diego and Oakland—should seek to build new stadiums in their current market. While Las Vegas is an enticing and exciting new location, there are simply too many odd variables about the city for me to accurately predict how well a team will do there. Additionally, both the Chargers and Raiders have existing fan bases in their current cities that may support their team even more with a new stadium.

Basketball

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[161] "College Football's Most Engaged Fans." *Ticket City.*
[162] Ibid.
[163] "Vanderbilt Official Athletic Site - Vanderbilt University." *Vanderbilt Official Athletic Site - Vanderbilt University.*

For basketball, my best recommendation for basketball expansion is Kansas City, which performed well in the football model, had a strong finish (but weak overall results) in the baseball model, and is geographically close to top performers Oklahoma City and Dallas. With a strong tradition of basketball excellence from the University of Kansas right next door,[164] [165] perhaps these fans would naturally also support an NBA franchise. Or, perhaps the popularity of college basketball is a red flag like it is in Indianapolis.

An additional option would be Pittsburgh. Examples of cities with strong basketball attendance in this region are Cleveland, Chicago, and Toronto. However, Pittsburgh has some notable drawbacks. Basketball teams garnered little support in Indianapolis and Philadelphia—two of the closest major cities to Pittsburgh. Additionally, Pittsburgh returned poor results in the baseball regression, perhaps indicating a mirror of a city like Denver. This market only supported football strongly and outputted middling results for baseball and basketball.

Ultimately, it seemed like small population cities were some of the worst performers in basketball. This is not at all proven though, as Salt Lake and Portland were two of the top finishers. However, all 5 of the bottom performing basketball markets are small metro areas compared to Chicago or Dallas.

The team most in need of a relocation is the Sacramento Kings. However, with the construction of a brand new stadium in Sacramento,[166] it looks like they will not be in the move any time soon. As this arena has been constructed after the time period examined in my regression, there may be an attendance boost for them in the future that could change my mind. For the time being, the Kings were one of the worst performers in a city that I feel does not have the same upside as other poor basketball performers. In a case like Philadelphia, I believe enough

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[164] "Monday Poll Results: KU Men's Basketball Team Goes up and Gov. Sam Brownback Goes down." *Kansascity.*
[165] "Kansas Leads League in Home Attendance for the 30th-Straight Season." *University of Kansas.*
[166] "Kings Open New Arena," *NBA.com*

in the market that so strongly supported the Phillies (basketball) and Eagles (football) to rebound once the 76ers improve their play on the court.

One of the worst overall markets was the entire state of Florida, with only the Miami Heat and Orlando Magic (both basketball) reflecting high attendance for their teams. For every other instance, the Tampa, Miami, and Jacksonville markets finished near the bottom of their respective leagues. In general, I advise professional sports stay out of Florida.

IX. Conclusion

My study shows that I cannot make any one full-fledged relocation or expansion recommendation regardless of the sport. In each circumstance, the factors that determine which teams have good or bad fan support through attendance are sport-specific. Even factors, like win percentage, which were very significant in one sport, proved to be insignificant in another. Nevertheless, my model successfully identifies the strongest and weakest markets in each sport, and is able to help me make a recommendation for which teams are most in need of a relocation.

It seems like the most consistent thread for strong performers, whether it be the St. Louis Cardinals or Dallas Mavericks, is sustained on-field success over a long period of time. Even though win percentage is insignificant in the football regressions, teams should pursue long-term winning as an overarching goal. Even if they fail to catch on in their city, eventually, they will relocate and somewhere that is willing to support a winning franchise

Ultimately, sports markets can develop in unforeseen ways. With effective team management and fan engagement, most teams can find ways to be successful in their current locations. Only in extremely hopeless situations should a relocation be considered. As teams grow to mimic the culture of the city they are currently in, their ties with the fan base should grow ever stronger.

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