

Empirical Analysis of NFL Ticket Price Determinants

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Abstract:

This research paper examines the determinants of revenue for National Football League (NFL) franchises with respect to ticket prices. Using a dataset of ticket prices and various factors such as team performance, stadium capacity, market size, and team revenue, we analyze the relationship between ticket prices and a franchise's revenue. The results align with past studies in this area of research as they indicate that past team performance and average attendance have the strongest effect on ticket prices. Additionally, the results reveal that stadium capacity and market size most significantly affect team revenue. We find that ticket prices are less sensitive to stadium capacity and market size than team performance. Again, the results align with previous literature as the findings suggest that teams price their tickets corresponding to the inelastic portion of demand. Overall, this study provides insights into the economics of NFL ticket pricing and highlights the importance of strategic decision-making in maximizing revenue for teams.

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1.0 Introduction

Prior to the 2022 season, Forbes.com evaluated every NFL team as being worth at least over \$3 billion. This past year, the valuation for the average NFL team increased 28% to \$4.47 billion. A major aspect of the NFL's revenue stream is ticket sales, which contribute significantly to a team's financial success. There are several economic factors that contribute to the complex process of NFL ticket pricing.

From the Forbes valuations stated previously, the NFL has been consistently found as the most profitable league in the United States. Despite popular criticism laid out on owners for charging so much out of pure greed, sports economists generally find that fans actually pay a lower price than that which would maximize profits for the team. In sports economics, ticket prices are commonly assumed to correspond to the inelastic portion of demand, which is below the profit-maximizing price of an NFL team. Understandably, the reoccurring findings of inelastic ticket prices below the profit-maximizing level raise questions for researchers, and there are few explanations for this behavior.

This research paper aims to analyze NFL ticket price determinants by focusing on the factors which impact prices the greatest. Using a dataset of average ticket prices and numerous economic factors such as regional population, stadium capacity, team revenue, and average attendance, this study attempts to examine the factors that most affect NFL franchise revenue and their corresponding ticket prices. These factors are also complemented by "variables of prestige" such as win percentage, number of pro bowlers, and number of Super Bowl wins as of the 2022 season. By testing these variables against the dependent variables (average ticket prices and team total revenue) the study can identify possible relationships between the listed factors and NFL ticket prices.

The paper is organized so we first provide an overview of the relevant literature on the economics of professional sports as well as the factors that influence ticket prices. Then, we will describe the strategy and methodology for gathering and testing the data, including the variables and statistical methods. To conclude, we will next present the results of the analysis and discuss the implications of the findings for teams and their fans.

The findings in this study contribute to the understanding of the economics of the NFL while providing insights into the factors determining ticket prices. By identifying the key determinants, this study may help NFL teams make strategic decisions about ticket pricing and optimize their revenue streams. The research has valuable implications for fans just as much for teams, as fans may use the findings in this study to shed light on the factors that influence the cost of attending their favorite football team's game.

2.0 Price Elasticity of Demand for NFL Ticket Pricing with Respect to Revenue

The accepted reasoning for this inelastic ticket model is related to profit maximization when other non-ticket revenues are included in the team's objective plan. In this theory, owners follow additional multiproduct to their pricing strategy. Ticket prices in this theory are set in the inelastic region of demand to maximize total stadium revenues which includes parking, concessions, merchandise, etc. (Krautmann and Berri, 2007). Similarly, other researchers with this theory often include local and shared television revenues as trade-offs to inelastic ticket pricing (Brunkhorst and Fenn, 2010). Figure 1, it is listed as the top twelve most expensive NFL games to attend.

Figure 1: Inelastic Pricing of NFL Tickets (Top 12 most expensive games to attend)

Rank	Team	Average Ticket	16oz. Beer	Hot Dog	Parking	Total
1.	Las Vegas Raiders	\$153.47	\$12	\$8	\$100	\$273.47
2.	San Francisco 49ers	\$139.71	\$11.50	\$5.50	\$85	\$241.71
3.	New England Patriots	\$131.45	\$8.40	\$4.50	\$80	\$224.35
4.	Dallas Cowboys	\$99.50	\$9.50	\$6	\$95	\$210
5.	Carolina Panthers	\$114.67	\$10.50	\$3	\$81	\$209.17
6.	Los Angeles Rams	\$103.62	\$13.75	\$8	\$80	\$205.37
7.	Washington Commanders	\$110.07	\$11	\$5	\$65	\$191.07
8.	Philadelphia Eagles	\$127.06	\$14.67	\$6	\$40	\$187.73
9.	Green Bay Packers	\$128.93	\$9.50	\$6	\$40	\$184.43
10.	Los Angeles Chargers	\$80.38	\$13.75	\$8	\$80	\$182.13
11.	Baltimore Ravens	\$110.38	\$8.13	\$3	\$55	\$176.51
12.	New York Giants	\$115.31	\$13	\$7	\$40	\$175.31

Source: James Brinsford; *Newsweek*

There is an abundance of literature that covers studies on a professional team's attendance, revenue, and individual ticket pricing. Many of them focus on gate receipts alone, while others focus primarily on secondary ticket transactions from third-party sellers (Salaga and Winfree, 2013; Diehl et al., 2015). As well, a few (Marburger, 1997) model sports teams as multi-product monopolists that sell both admission and concessions. There are other arms of this type of literature that focus on the relationship between ticket prices and home-field advantages. This study, however, will be focusing on the average ticket price (average of both gate receipt and secondary market) for a specific team throughout the duration of a given season concerning prestige variables such as the number of star players and Super Bowls won by a given franchise.

In this area of study, it is a challenge to obtain price and quantity data for variables that pertain to individual teams such as quantity demanded, seat quality, and ticket complements, especially since all stadiums do have capacity restrictions. As a result, researchers have heavily relied on aggregate demand attendance figures and average ticket prices which are impossible to capture the true variation in demand that exists for specific seating locations, and accordingly the consumer types (Marburger, 1997; Fort, 2004; Diehl et al., 2015). Furthermore, total attendance measurements do not provide information on the number of spectators in a particular section, or a particular type of ticket. To clarify, it is difficult to distinguish whether a certain ticket holder owns season passes or is simply a single-game ticket holder. Given the countless amounts of seats and sections for the stadiums examined, such price averages are likely to be biased estimators of the prices paid by ticket holders. Therefore, it is also likely that the average price given in this field of study understates the price of the most desirable tickets (lower-level and box seats), and consequently overstates the average price of the least desirable tickets (upper-level seating). It is also important to note that more desirable tickets are more likely to be sold out compared to less desirable tickets (Krautmann and Berri, 2007; Diehl et al., 2015). Figure 2 displays the top 24 teams based on average home attendance for the 2022 season. Through Figure 2, one may receive a better understanding of the team's market size, it is no surprise that Dallas and the two New York teams are the top three by average attendance. However, being that Green Bay is a relatively smaller market size, it is surprising to see the Packers rank fourth, yet their fan base is famously known for being one of the most loyal in sports.

Figure 2: Average Home Attendance (Top 24 franchises based on home attendance)

Rank	Team	Games	Total	Average	Percentage
1.	Cowboys	9	841,192	93,465	93.5
2.	Jets	8	624,075	78,009	94.6
3.	Giants	9	688,266	76,474	92.7
4.	Packers	9	685,623	76,180	96.5
5.	Broncos	8	607,845	75,980	99.8
6.	Chiefs	8	587,997	73,499	100.8
7.	Rams	9	654,606	72,734	101.7
8.	49ers	9	644,661	71,629	104.6
9.	Panthers	9	642,167	71,351	96.7
10.	Ravens	8	564,714	70,589	99.8
11.	Chargers	8	559,644	69,955	97.8
12.	Eagles	9	628,828	69,869	100.0
13.	Falcons	9	626,248	69,583	92.8
14.	Buccaneers	9	620,898	68,988	103.2
15.	Saints	9	620,889	68,987	96.1
16.	Seahawks	9	619,491	68,832	100.1
17.	Titans	8	548,929	68,616	99.2
18.	Bills	8	547,450	68,431	95.5
19.	Texans	8	543,294	67,911	94.3
20.	Browns	8	539,448	67,431	100.0
21.	Vikings	9	600,183	66,687	100.3
22.	Jaguars	8	531,675	66,459	97.9
23.	Steelers	8	530,243	66,280	96.9
24.	Bengals	7	463,733	66,247	101.1

Source: ESPN.com

Another variable in this field of study that is considered valuable, yet hard to obtain, is fan loyalty. The most loyal customers of a sports franchise are their season ticket holders, who are generally considered to be less sensitive to ticket price year-over-year changes. In previous research, it has also been consistently found that single-game buyers have a greater price elasticity than season ticket holders, accordingly, single-game buyers are classified as casual fans (Scully, 1989; Simmons, 1996; Fort, 2004; Diehl et al., 2015). For this study, the geographic population for each team has been obtained in the hope of finding a correlation between ticket prices and the population of the region in which a team is located. In this sense, this element is brought into the study for teams such as the Green Bay Packers and the Buffalo Bills. The regional population must be utilized in this field of research so that the fan loyalty variable can

be potentially tested. It is known that Buffalo and Green Bay have some of the most passionate fans in the NFL while being in lesser populated regions compared to markets like Los Angeles or New York.

3.0 Literature Review for NFL Ticket Pricing

NFL teams face a variety of costs associated with operating their franchises. These costs contain player salaries, stadium expenses, marketing costs, and other operating costs that are necessary for the franchise. To combat these costs, owners use a variety of strategies to generate profits including pricing strategies, revenue sharing, and licensing agreements. Understanding these strategies and their impact on profit maximization is important for both team executives and fans (Brunkhorst and Fenn, 2010). In Brunkhorst and Fenn's study, the two men conducted a study examining the factors affecting profit maximization in the NFL. In their study, the men were able to gather data on revenue, costs, and profits for 32 NFL teams during the 2007 NFL season. The analysis focused on two main strategies: ticket pricing and revenue sharing. Ticket pricing was found to be a significant factor in profit maximization. Brunkhorst and Fenn (2010) found that teams that charged higher prices for tickets tended to achieve higher profits. Accordingly, the two men also found that the teams who charged the highest prices also tended to have lower attendance rates, suggesting a possible trade-off between ticket prices and attendance. The other main strategy analyzed, revenue sharing, was also found to be a significant factor in profit maximization. In the NFL, there is a revenue-sharing system in which all teams share a portion of their revenue, including revenue from ticket sales, merchandise, and broadcasting rights. Brunkhorst and Fenn (2010), find that revenue sharing has a positive impact on profits for smaller-market teams, but a negative impact on profits for larger-market teams. Their conclusion suggests that revenue sharing may help level the playing field for small-market teams yet have unintended consequences for larger-market teams. The two men also call for the exploration of further research on how these two main strategies may vary across different markets over time.

While there is a substantial amount of research and data on the topic of professional sporting event ticket prices, there is a lack of literature on the NFL specifically. Salaga and Winfree (2013) looked to find the determinants of NFL ticket prices. In their study, they were cleverly able to obtain a gauge of these determinants by testing the resale price of individual

teams' Personal Seat Licenses (PSLs) or Season Ticket Rights (STRs) in the secondary resale market. In Salaga and Winfree's article, the two researchers view PSLs and STRs as an excellent way for NFL franchises to generate revenue. However, when fans buy these PSLs and STRs, they are very easily able to sell single-game tickets on the secondary market. Salaga and Winfree viewed the secondary market as a better determinant of ticket sales as there is more of an element of pure supply and demand. The data examined was on PSL and STR sales prices for all 32 NFL teams during the 2011 season. A variety of other factors such as stadium characteristics, team performance, and market demographic were also tested. Salaga and Winfree concluded that all three of these factors are statistically significant to secondary market prices. Tickets for teams with higher winning percentages, teams with newer and more comfortable stadiums (and higher capacity stadiums), and teams with fans of greater population size and income levels are found to have significantly more expensive secondary market ticket prices.

Pricing strategies in professional sports are complex with many factors influencing the price of tickets and concessions. While there are many studies on the factors determining ticket prices of professional franchises, Krautmann and Berri's (2007) study aimed to investigate the price elasticity of demand in the context of concession pricing in professional sports. To measure the price sensitivity of fans, Krautmann and Berri gathered data on concession prices and sales volume for Major League Baseball, the National Football League, the National Basketball Association, and the National Hockey League during the 2004-2005 seasons. The study found that the price elasticity of demand for concessions varied depending on the league and the type of concession. For example, beer and hot dog sales were found to be relatively inelastic in the NBA and MLB, while being relatively elastic in the NFL. Over the big four professional leagues, the study found that the concessions with higher prices tend to have lower sales volumes, indicating that fans are generally price-sensitive when it comes to concessions. The study is also consistent with future findings on ticket prices as the teams with the highest quality rosters and opponents positively influence the price elasticity of demand (Krautmann and Berri, 2007).

The secondary market for sports tickets has become a crucial source of revenue for many professional sports teams. For franchises to maximize profits, NFL team executives must understand the price elasticity of demand for these tickets. Diehl et al. (2015), performed a study on this topic to investigate the sensitivity of consumers to changes in ticket prices. In this study,

the three researchers use data from the NFL to shed light on this NFL fan price sensitivity. In the context of sports tickets, understanding the price elasticity of demand allows franchises to maximize revenues by setting prices that will maximize profits while also attracting the maximum number of fans. Diehl et al. (2015) focused their analysis on the price elasticity of demand for regular season games, playoff games, and the Super Bowl. The results from their study suggest that NFL fans are relatively price-sensitive to game tickets in the secondary market, particularly for higher-demand events such as the Super Bowl. Other factors such as team performance, stadium capacity, and market demographic were found to be significant predictors of demand in the secondary market. The findings by Diehl et al. (2015) align with previous studies (Krautmann and Berri, 2007) as team performance, stadium capacity, and market size were all positively correlated with higher demand for tickets in the secondary market.

In another attempt to capture evidence of the price elasticity of demand in professional sports, Coates and Humphreys (2007) examined the relationship between ticket prices, concessions, and attendance at all major four professional sporting events in their study. Like the other study performed by Krautmann and Berri (2007), Coates and Humphrey also collected data from the MLB, NBA, NFL, and NHL, but during the 2002-2003 seasons. However, unlike Krautmann and Berri, Coates and Humphery focused their study on the effects of ticket price changes rather than concession stands. Coates and Humphrey (2007) found that higher ticket prices were typically associated with lower attendance, especially for weekday games. As well, the two men found that the effect of ticket prices on attendance varied depending on the quality of the team and the importance of the game. To clarify, higher ticket prices were found to have a smaller negative impact on attendance when the game means more, such as a playoff game or a game between two teams with winning records.

Professional sports franchises are often accepted as drivers of local economic growth and development. Yet, just as often city councils reject the idea of hosting professional teams, therefore making it a subject of debate of just how beneficial it is to host a professional sports team in one's local community. Kuznitz (2011) examines the local economic impact of the four major professional sports leagues and their teams in the United States in his study. In the study, Kuznitz classifies the economic impact of professional teams into two categories: direct and

indirect. The direct impact includes the spending by teams on goods and services within the local economy, while the indirect impact includes the economic activity generated by fans attending the games, such as spending on hotels and community restaurants. Kuznitz (2011) found that the economic impact of sports teams on their local economy is often overstated. The study finds that the direct impact of teams on the local economy can be substantial, however, the indirect impact is often minimal. These findings are especially apparent with teams that have low-performance records and poor-quality rosters. Furthermore, many of the economic benefits of sports teams, such as job creation and new infrastructure, are generally temporary and often do not lead to long-term economic growth (Kuznitz, 2011).

4.0 Data and Empirical Methodology

4.1 Data

The study utilizes 2021-2022 cross-sectional data for the variables potentially affecting NFL team revenue and ticket prices. The data used in this study are derived from multiple sources. 2022 NFL team revenue was found from Forbes valuations, 2021 average price per ticket, amount of Super Bowl wins, and the number of teams per region was found from Statista.com. The study also used data on the 2021-win percentage, 2022 average attendance, 2022 returning Pro Bowlers per team, and team stadium capacity from ESPN.com. Finally, the last variable, region population (market size), was attained from census.gov. Summary statistics for all variables are listed in Tables 1 and 2.

Table 1: Summary Statistics

	<i>Average Ticket Price</i>	<i>Region Population</i>	<i>Average Attendance</i>	<i>Stadium Capacity</i>	<i>Win %</i>
Mean	\$107.05	5376777.34	69389.16	70470.22	50.11%
Median	\$105.04	3784276.5	68724	69137.5	48.55%
Standard Deviation	\$17.52	4951394.71	6322.31	5498.79	18.39%
Minimum	\$80.38	321591	58106	61500	17.60%
Maximum	\$153.47	19979477	93465	82500	82.40%
Count	32	32	32	32	32

Table 2: Summary Statistics

	# of Pro Bowlers (2022)	# of SB Wins	# Pro teams in region	Team Revenue
Mean	2.75	1.78	3.594	\$537,093,750.00
Median	2.5	1	3	\$511,000,000.00
Standard Deviation	2.032	1.913	1.965	\$110,430,348.61
Minimum	0	0	1	\$452,000,000.00
Maximum	7	6	9	\$1,087,000,000.00
Count	32	32	32	32

4.2 Empirical Methodology

The model that is adopted and modified in this study is acquired from Brunkhorst and Fenn's (2010) study. From their study, this study can embrace specific variables such as home attendance, winning percentage, the population of the home city, Pro Bowl selections, stadium capacity, and dummy variables for divisions. This study differs from Brunkhorst and Fenn's, as this tests for revenue concerning ticket prices, rather than profit concerning ticket prices. Moreover, here tests for revenue rather than profit due to the lack of sufficient 2022 data on player, stadium, and team operational expenses. In these models, we have added the 2022 average ticket per home team, total revenue for each NFL team, the number of Super Bowl wins a franchise has achieved, and the number of pro teams within the NFL team's region. We introduced Super Bowl wins and the number of pro teams within region variables as this study hypothesizes that these factors play a significant role in an NFL team's revenue and ticket prices.

In this study, three separate models were used to display changes in an NFL team's revenue and average ticket price. The models can be written as follows:

$$TR_t = \beta_0 + \beta_1 ATP_t + \beta_2 Pop_t + \beta_3 Att_t + \beta_4 Cap_t + \beta_5 W\%_t + \varepsilon_t \quad \text{(Model I)}$$

$$TR_t = \beta_0 + \beta_1 ATP_t + \beta_2 Pop_t + \beta_3 Att_t + \beta_4 Cap_t + \beta_5 W\%_t + \beta_6 ProB_t + \beta_7 SB_t + \beta_8 PTR_t + \varepsilon_t \quad \text{(Model II)}$$

The first two models that are tested in the study pertain to the determinants of an NFL team's total revenue. This is the first dependent variable that is examined as it is viewed that team revenue is a better measure of fans actual choices (Krautmann and Berri, 2003; Salaga and Winfree, 2013; Diehl et al., 2015) than simply average ticket price. TR_t represents the total revenue of a specific NFL team t , at the beginning of the 2022 regular season. Data on all 32 teams' total revenue was found from Forbes' 2022 NFL valuation rankings. From the rankings, notably, the Dallas Cowboys experience the highest revenue with \$1.087 billion, while the

Detroit Lions experience the lowest NFL revenue at \$452 million. In this study, Diehl et al. (2015) definition of revenue is used as this study also assumes that tickets are priced in the inelastic portion of demand, meaning that franchises price tickets at a level lower than the profit-maximizing price. Therefore, for this study, we view the NFL team's revenue as the total gate receipts divided by the total attendance, plus non-ticket stadium revenues such as parking, merchandising, and concession sales (Diehl et al., 2015; Depken, 2001; Scully, 1989).

There are seven independent variables used to investigate the determinants of total team revenue. Appendix A provides the acronyms, descriptions, and data sources for each variable used in the study. First, Pop_t (the regional population of the home city t) represents the market size of a specific team. Variable #2 is Att_t , which simply represents the average attendance throughout the 2022 season for NFL team t . Followed by Cap_t , the total stadium capacity of team t . The study also uses PTR_t , representing the amount of other professional sports teams located within the same state or region as team t , whether the team is in the NFL or any of the other three major North American professional leagues. This study also introduces “variables of prestige”. The first prestige variable is $W\%_t$, which is the specific 2021 season winning percentage of team t . The next variable of prestige utilized was $ProB_t$, which is the number of Pro Bowlers expected to play on team t 's roster in the 2022 season, this variable displays the number of all-stars a team has on its roster. The final prestige variable is SB_t , this is considered the main variable of prestige as it represents Super Bowl championship titles, which is something not every NFL team has attained and is a variable that is often neglected in this area of research.

$$ATP_t = \beta_0 + \beta_1 Pop_t + \beta_2 Att_t + \beta_3 Cap_t + \beta_4 W\%_t + \beta_5 TR_t + \beta_6 ProB_t + \beta_7 SB_t + \beta_8 PTR_t + \varepsilon_t \quad \text{(Model III)}$$

The last model that is tested in the study pertains directly to a specific NFL team's average ticket price. ATP_t represents the average ticket price of a specific team, t . Unlike TR_t , ATP_t does not have a definition to it as it is simply the average of all gate receipt and secondary market prices taken at the end of the 2021 season. The data on average ticket prices derive from Alan Snel's, from LVSportsBiz.com, “fan cost index” which ranks Las Vegas Raider tickets most expensive at \$153.47 and ranks Las Angeles Chargers tickets the least expensive at \$80.38. Because this study does not consider other costs for fans associated with ticket prices such as costs for parking, concessions, and merchandising, this study only includes the average ticket

price index rather than the combination of average ticket price and fan cost index that is found in Coates and Humphreys (2013) study.

Like the models that we ran to investigate total team revenue, we use the same blueprints to test average ticket prices. Utilizing the same six independent variables as in models I and II, team total revenue is added into the regression for average ticket prices.

5.0 Empirical Results

Presented below are the empirical results from regression models I, II, and III. Model II has the best fit out of all the regressions run, accounting for 73% of the variation in the dependent variable Team Revenue. Model I also fit well explaining 67% of the variation in the dependent Team Revenue variable. In both models, I and II, the independent variables Average Attendance and Stadium Capacity are significant at a 1% level. However, these models do differ somewhat. In Model I, Average Ticket Price is statistically significant at the 5% level. Furthermore, model II displays that Regional Population and Super Bowl titles are both statistically significant, Super Bowl wins being more significant to Team Revenue than Regional Population. Average Ticket Price is no longer statistically significant when the variables Pro Bowlers, Super Bowl titles, and Pro Teams within Region are added to model II. The fit of model III is relatively low explaining just 41% of the variation in the independent variable Average Ticket Price. The only variable shown to be statistically significant in this model is Super Bowl titles at a 5% level.

Table 3: Regression Results for Models I, II, and III

Variables	I (TR)	II (TR)	III (ATP)
Constant	-\$198,957,712.74	\$122,364,769.81	\$136.18
	0.288	0.575	0.00394
TR	DV	DV	3.80825E-08
	DV	DV	0.430
ATP	\$1,853,494.13	\$687,288.95	DV
	0.0169**	0.430	DV
Pop	\$2.95	\$14.83	5.41414E-07
	0.297	0.0904*	0.799
Att	\$20,585.86	\$19,687.92	-0.00155
	0.00000205***	0.00000776***	0.211
Cap	-\$12,731.28	-\$14,091.47	0.000882
	0.0031***	0.0016***	0.446
W%	-\$18,952,885.76	-\$35,891,114.30	-\$11.92
	0.796	0.604	0.463
ProB		-\$4,416,566.05	-\$0.44
		0.508	0.780
SB		\$18,652,076.60	\$5.14
		0.0357**	0.0121**
PTR		-\$31,931,551.15	-\$2.46
		0.137	0.634
R2	0.667	0.734	0.415
F-Stat	10.424	8.297	2.13
Number of obs.	33	33	33

Note: *, **, and * denotes significance on a 1%, 5%, and 10% respectfully.**

P-Values are shown under the coefficient estimate.

The study found Average Ticket Price (ATP) to have a positive and statistically significant impact on a Team's Total Revenue at a 5% level in model I, yet is statistically insignificant in model II with the addition of the prestige variables. Average Ticket Price positively correlating with Team Total Revenue aligns with Brunkhorst and Fenn's (2010) study on profit maximization in the NFL as they found that teams with higher ticket prices tend to achieve the highest profit margins. In economic theory, this finding is in accordance as when the average price of tickets increases, *ceteris paribus*, the team's total revenue should therefore increase greatly over the span of a full regular season.

Unlike Average Ticket Prices, Regional Population (Pop) is positive and statistically significant in model II at a significance level of 10%, yet is statistically insignificant when the variables of prestige are omitted in model I. This positive correlation is as expected, however, is a surprise that it is not as strongly correlated as hypothesized. For an NFL franchise, those franchises that are home to larger Regional Populations, which is a proxy for fanbase size, are expected to gain higher revenues due to a greater demand for tickets. From the study, we find

that one unit change in Regional Population leads to a \$14.83 increase in a Teams Total Revenue. It has not been tested but is assumed that Regional Population and Average Attendance are also positively correlated. This study on Regional Population (fanbase size) aligns with Salaga and Winfree's (2013) findings that a larger population size of a fanbase correlates with higher revenues for franchises. However, it was found that the size of the team's Regional Population has a small positive, but no significant effect on the Average Ticket Prices of their team.

Average Attendance (Att) and Stadium Capacity (Cap) are both statistically significant at the 1% level to a Team's Total Revenue in both models I and II, as expected, as these variables are viewed to be related. The variables do differ in their findings, however. Average Attendance positively influences a Teams Total Revenue. A one-unit change in the Average Attendance over the course of a regular season increases Teams Total Revenue by \$20,585.86 in model I, and by \$19,687.92 in model II when the variables of prestige are added to the regression model. This finding goes against the trade-off of attendance and profits as mentioned in Brunkhorst and Fenn's (2010) study. Although in this study, this finding is not surprising as additional attendance corresponds to more tickets being sold and therefore higher revenues, all else remaining equal. This finding is also not a surprise due to the lack of sufficient data found on the operation costs of an NFL stadium. It is assumed that Average Attendance is not as statistically significant with the addition of stadium cost variables. Also, it is assumed that smaller-market franchises benefit more from additional attendance than more established, larger-market franchises. Average Attendance did not play a role in the Average Price of Tickets for an NFL franchise.

Franchises are restricted to the number of tickets they may sell due to the capacity size of their stadiums. The variable Stadium Capacity (Cap) is statistically significant at the 1% level and harms a franchise's revenue. This finding does not align with previous research (Salaga and Winfree, 2013; Diehl et al., 2015) which states teams with higher capacity stadiums do experience higher profits, however, this study slightly differs. In theory, and as it is assumed, a franchise with a higher capacity stadium should experience higher profits. Although, this study is testing the effects of additional capacity on a team's revenue, strictly. Therefore, it is clearer why the model displays a unit increase in Stadium Capacity has a -\$12,731.28 effect on Team's Total

Revenue in model I, and a -\$14,091.47 effect in model II. To produce more capacity a team must spend a high percentage of their revenue, which is why a negative correlation between Stadium Capacity and Team Total Revenue is not unexpected. Again, Stadium Capacity was not found to correlate with Average Ticket Prices.

The only variable found to correlate both Team Total Revenue and Average Ticket Prices, and the only variable that is statistically significant to ticket prices, was Super Bowl Titles (SB). In models I and II respectively, the Super Bowl Title variable is statistically significant at the 5% level and displays a positive force on both revenue and ticket prices. This is not at all shocking, as this variable is a proxy for the pinnacle achievement in the NFL and is the ultimate measure of prestige. This finding presents the notion that a past team's performance does indeed impact the revenue and ticket pricing of an NFL franchise. And it is assumed that the number of Super Bowl Titles marginally increases NFL team revenue and ticket prices. Also, whether it be one or multiple Super Bowl wins, the demand for an NFL team's tickets does skyrocket with a Super Bowl win. From model II, it is indicated that a Super Bowl win translates to an \$18,652,076.60 increase in a Team's Total Revenue. And from model III, fans should expect an increase in the price of tickets of at least \$5.14 on average. This finding does align with other studies (Brunkhorst and Fenn, 2010; Salaga and Winfree, 2013; Diehl et al., 2015) as team performance, revenue, and average ticket prices are all positively correlated. Team owners should take note of this variable, as a Super Bowl win not only places an NFL team on a pedestal for league prestige but can also be used as a financial cushion for future seasons. Furthermore, it is assumed that a Super Bowl title is essentially the only trade-off that a fan would accept for higher ticket prices.

Shockingly, Super Bowl Titles were the only variable of prestige to have a statistically significant effect on either Team's Total Revenue or Average Ticket Prices. Team Winning Percentage (W%), was the most surprising conclusion as it directly goes against the findings of Brunkhorst and Fenn (2013) who tested that previous season winning percentage does play a small, yet significant role on average ticket prices. This study's result of the winning percentage being statistically insignificant is not concerning, however. As it is cited in Brunkhorst and Fenn's (2013) findings, previous seasons' winning percentage is quietly significant due to the franchise owner's lack of knowledge of how the team will be performing on the field in the

upcoming season. This is why it is not concerning that the winning percentage has no correlation to Team's Total Revenue and Average Ticket Price in this study's models.

The number of Pro Bowlers (ProB), as a proxy for the number of all-stars on the roster, was found to be negatively correlated, yet statistically insignificant to both Total Team Revenue and Average Ticket Price. This is an unusual finding for this study as it goes against the findings cited in Krautmann and Berri's (2007) study which established that teams with quality rosters, and teams that play quality rosters more frequently, tend to have higher Average Ticket Prices. Through this study, it is now assumed that teams with higher-quality rosters may have increased ticket prices, although, these teams suffer greater hits to their revenue because of the costs associated with retaining these high-quality players. The findings in this study again align with Brunkhorst and Fenn (2010) as they also found that star players do not play a significant role in a franchise's total revenue or average ticket price.

As for Pro Teams Within Region (PTR) and the dummy variable for specific divisions, there should be more research and focus done on these topics to ensure that there is no relationship between these variables and Total Team Revenue and Average Ticket Prices. For Pro Teams Within Region, however, could be slightly statistically significant as it is somewhat negatively correlated with Total Team Revenue. More research needs to be done, as there is a possibility that the number of pro teams within an NFL franchise's region may hinder the demand for NFL game tickets. This is especially a possibility due to the NHL and NBA seasons overlapping with the NFL, and it is assumed that teams from other leagues act as substitutes rather than complements. The dummy variable for specific divisions was omitted from the study as there were no correlations found between specific divisions and Total Team Revenue or Average Ticket Prices.

Unfortunately for this study, there was a lack of sufficient data on other aspects that affect a franchise's profitability, hence the reason why this study focuses the attention on purely revenue rather than profit. Unlike Krautmann and Berri's (2007) study, this study was unable to attain sufficient data pertaining to the costs and corresponding revenues of other franchise aspects such as concessions, merchandising, parking, personnel salaries, and marketing. Although, from this limitation, franchise owners can gather a clearer message. For owners, their number one priority should be acquiring the top talent within their team's financial means, and

ultimately, reaching the pinnacle of the NFL by winning a Super Bowl title. From the study, owners may gather and assume that fans' willingness to pay for tickets, concessions, parking, and merchandising drastically increases when a franchise reaches its ultimate goal of winning the Super Bowl.

6.0 Conclusion

Overall, this study has attempted to gain insights into the determinants of NFL ticket prices as well as the factors that play into an NFL team's revenue. From this study, it has been found that Regional Population (fanbase size), Average Attendance, Stadium Capacity, and the number of Super Bowl titles all play a factor in an NFL franchise's revenue. Also, we can conclude that many outside factors that could play a role in a franchise's revenue often do not also play a role in the determinants of ticket prices. The main factor found in this study to correlate both an NFL franchise's revenue and ticket prices is Super Bowl titles. It is now undoubtedly a fact that winning a Super Bowl does not only put a franchise on a pedestal in terms of NFL prestige, but it also places a franchise on a financial cushion as well. For NFL owners, their number one priority should be the talent that they are responsible for signing to play on the field, as it is the only factor tested in this study affecting revenue that owners essentially have control over. Moreover, a Super Bowl win is the only trade-off a fan would accept for more expensive tickets. More research on this topic is recommended as there are factors in this study that need more examination. For example, it is assumed that the number of professional teams within an NFL team's region is detrimental to a franchise's revenue, as teams from other leagues could be considered substitutes. However, in this study, there were no correlations found between the number of professional teams within the region and team total revenue or average ticket prices.

Appendix A: Variable Description and Data Source

Acronym	Description	Data Source
ATP	Average Ticket Price	Statista.com
TR	Total Team Revenue (2022)	Forbes
Pop	Regional population for a specific NFL team	Census.gov
Att	Average home stadium attendance (2022)	ESPN.com
Cap	Home field stadium capacity	ESPN.com
PTR	The number of professional teams in the same region as a particular NFL team	Statista.com
W%	Teams 2021 winning percentage	ESPN.com
ProB	Number of Pro Bowlers (all-stars) on the team roster at the beginning of the 2022 season	ESPN.com
SB	The number of Super Bowl titles that a franchise has won in their team history	Statista.com

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