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THE IMPACT OF PLAYER SALARIES ON NFL TICKET PRICES—FURTHER EVIDENCE

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ABSTRACT

Debates about the cost of ticket prices have always been an ongoing phenomenon for sports fans that attend games. Indeed, ticket prices for National Football League (NFL) games have risen over the years, but so have income levels of game attendees as well as overall fan interest in games. New claims by certain fans stemming from the "kneeling" protests that began in 2016 NFL season have brought the salaries of NFL players and the impact of those salaries on ticket prices into further focus. Using data from 2011 through 2016, this study found that player salaries do have a statistically significant if low effect on the price of tickets in the NFL.

Keywords: Ticket prices, fan interest, NFL games, salary caps, monopoly, fan loyalty

INTRODUCTION

Debates about the cost of ticket prices have always been an ongoing phenomenon for sports fans that attend games. Indeed, ticket prices for NFL games have risen over the years, but so have income levels of game attendees as well as overall fan interest in games. New claims by certain fans stemming from the "kneeling" protests that began in 2016 NFL season have brought the salaries of NFL players and the impact of those salaries on ticket prices into further focus. Are angry ticket-buyers justified in their claims that the high ticket prices are a result of the high salaries of NFL players?

All businesses enterprises focus their attention around ways to increase their profits as a primary goal. The National Football League (NFL) is no different. The NFL is a monopoly because the absence of other football leagues in its market place, meaning there is no competition for the sport at the national level in the U.S. Basketball and baseball enjoy similar advantage. Even with such an advantage, however, teams in the sports industry must continuously find ways to increase revenue. One of the ways they do this is by shifting the demand curve and by trying to keep fan loyalty. Professional athletes make millions of dollars when they are drafted or are resigned. Some teams even have multiple players that make tens of millions of dollars a year. Even though there are salary caps in place to try and keep the cost of player payroll and keep

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competition among teams, this has not stopped some professional football players from making extraordinarily high salaries. The underlying question then becomes, exactly how do teams afford to pay their players such high salaries? Are the fans paying for the salaries in the form of high-ticket prices? The purpose of this paper is, therefore, to investigate the impact of player salaries on ticket prices in the NFL.

LITERATURE REVIEW

Rishe and Mondello (2004) preformed a cross-sectional study using data from 1996 to 2002 related to the National Basketball Association (NBA), NFL, National Hockey League (NHL), and Major League Baseball (MLB) in the United States. They concluded that the payroll of professional athletes do not affect the price of tickets in the NFL or the NHL; however, salaries did relate to higher ticket prices in baseball and basketball. The correlation between winning and team salary was the strongest in baseball, and the NBA seems to have a relationship between player salaries and ticket prices because its salary caps are not as strict as they are for the NHL and NFL teams. In other words, the 'soft cap' in the NBA may have contributed to a correlation between salaries and ticket prices. In this same study, Rishe and Mondello (2004) also found a significant relationship between a 'new stadium' and ticket prices, but no relationship in the population size of a metropolitan area and the ticket prices of a football game. Williams' (1994) had found similar results with Rishe and Mondello, that the salaries of players in the NFL do not affect the price of tickets. The Williams study looked into different cities with NFL teams that had scalping and those that did not have scalping laws for the period from 1988-1990, and concluded that it was not the player salaries that increased ticket price, but rather it was whether the cities allowed scalping or not. The cities without scalping laws tended to have lower ticket prices compared to cities that did have scalping laws. The Williams' study also found that ticket prices increased $0.64 with every 1 million people, lending support to the notion that the population size did not have meaningful impact on ticket prices. Another study by Kesenne and Pauwels (2006) executed a qualitative study about whether salaries of players affect ticket prices when the team owners are aiming to maximize profit or maximize wins. They found that teams that try to maximize wins tend to hire more talent and charge higher ticket prices than profit maximizing teams. This, they concluded, is because the higher salary level of players tends to reduce the ideal ticket price when the aim is to maximize profit. Accordingly, the higher salary reduces the demand for talent, which in turn causes the demand curve for tickets to shift inward, causing the profit maximizing ticket price to be lower than before (Kesenne and Pauwels, 2006). According to Leads and Allmen (2005, p. 37-38), ticket prices are not affected by player salaries because salaries are considered fixed cost. If player salaries are fixed costs, they do not affect the marginal cost, and in turn, would not affect ticket prices.

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Other studies examining causes of changes to ticket prices were conducted by Nieman and McCracken (2015); Lapides (2016); and Norris and Shewmaker (2014). While these studies did not examine the relationship between ticket prices and player salaries, they did find variables that significantly affect ticket prices. For example, Nieman and McCracken (2015) examined the determinants of average NFL ticket prices from 2010 to 2013, and they found ticket prices are impacted by the existence of other professional sports in the area, by population size, and winning percentage. Lapides (2016) studied what variables affected the NFL ticket prices during the 2014 season. He found significance in the unemployment rate, winning percentage from the year before, and attendance. Norris and Shewmaker (2014) studied the NFL from 2009 to 2012 and found that gross domestic product or more accurately (GDP) per capita, winning percentage, competing professional sports, and new stadium or renovations of a stadium, all increase ticket prices.

HYPOTHESIS

Nearly all of the literature reviewed for this study reveals that there is no relationship between player salaries and the price of tickets for the NFL. We postulate the hypothesis that, for a profit-maximizing firm, player salaries do not affect the cost of tickets in the NFL for the period 2011-2016. As Kesenne and Pauwels (2006) stated, higher salaries tend to reduce the demand for ticket prices, which causes the demand for tickets to decrease. If the demand curve shifts inward for a monopolist, then it follows that the price of the tickets will decrease if the firm wishes to maximize profit. Also, salaries may not influence ticket price due to player salary caps. The limit on the salary caps could potentially keep the salaries low enough that owners may not need to increase the price of tickets to make up for the money spent on salaries. Instead, it is possible that the money for salaries could come from other income generated by the teams. Therefore, ticket prices do not need to increase to make up for the increase in player salaries.

METHODOLOGY

Data was collected on all thirty-two national football league teams in the United States from 2011 to 2016. The weighted average ticket price was used as the dependent variable and the independent variables were winning percentage, the average home game attendance, the salary of players in millions, real GDP per capita, population, and the number of professional teams in the metropolitan area. We also included a dummy variable to account for new stadiums or recently renovated stadiums. The independent variables were chosen based on previous research. The data for the weighted average ticket price and winning percentage was collected from Rodney Fort's Sports Business Data Pages. The data for average home game attendance was taken from ESPN. The real GDP per capita and population of the cities were both collected from the St. Louis Federal Reserve. Once data were obtained, we preformed the Hausman test, which rejected

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the random effect method. As a result, we chose to run a fixed effect panel regression model to see if any of the variables had a significant effect on the price of tickets.

The Model to be estimated, therefore, is the following:

WatPij = ao + a1WINPij + a2 ATTij + a3 SALij + a4

RGDPij +a5 POPij + a6 NTMAij +

A7 DUMij + eij

Where: WATP is the weighted average ticket price

WINP is the winning percentage

ATT is attendance

SAL is salary

RGDP is real gross domestic product per capita

POP is the population in the metropolitan area

NTMA is the number of teams in the metropolitan area

DUM is a control variable for a new or refurbished stadium

The ij represents the ith team and the jth year as appropriate

RESULTS

The regression identified four statistically significant variables in the model, and they are: attendance, player salary, real GDP/Capita, and size of the population. The results of the model are provided below.

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Random-effects GLS regression                   Number of obs      =       192
Group variable: year                            Number of groups   =         6

R-sq:  within  = 0.3782                         Obs per group: min =        32
       between = 0.9554                                        avg =      32.0
       overall = 0.4188                                        max =        32

                                                Wald chi2(7)       =    132.56
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

tcktprice	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
win	7.450057	5.722289	1.30	0.193	-3.765423	18.66554
attend	.0004749	.0001364	3.48	0.001	.0002074	.0007423
salary	.1294762	.0445397	2.91	0.004	.0421799	.2167725
gdp	.0006629	.0001139	5.82	0.000	.0004397	.0008861
stadium	7.543263	10.25708	0.74	0.462	-12.56025	27.64677
teams	1.487797	1.012153	1.47	0.142	-.495986	3.471579
population1	.0539873	.0234046	2.31	0.021	.0081152	.0998594
_cons	-16.79589	11.32001	-1.48	0.138	-38.98271	5.390921
sigma_u	0					
sigma_e	14.260837					
rho	0	(fraction of variance due to u_i)				

As can be seen in the results, the salary of the players is statistically significant in this model, indicating the salary of players does have an effect on ticket prices of NFL games. This seems a bit confusing at first because the salary of the players is an input cost for the franchise, and as input costs increase one would think the price of the output, ticket price, would also increase. Indeed, that appears to be the result of this finding. In the sports industry, professional sport teams have multiple income streams of which ticket prices are only one. Professional sport teams can generate income from television contracts, sales of memorabilia, and ticket prices. In reality, ticket prices only make up a small amount of the possible revenue a team could generate in a years' time. According to data found on Stata, on average ticket prices are around or just below twenty percent of revenue during the years of 2011 to 2016 in the NFL. And in this study, player salaries seem to contribute roughly 12% of the size of ticket prices. A reason why the salaries of players may have had no significant effect in other studies is that the salaries, as mentioned earlier, are fixed cost. If a player signs a contract to be paid, say, a million dollars, then the team must pay the player that amount no matter whether output increases or decreases. Since the cost is already calculated in the number of tickets sold, the price at which tickets are sold to maximize profits will not change (Leeds and Allmen, 2005). That explains why other studies may have arrived at the opposite conclusion. In the end, it actually makes sense why salaries of players do not significantly affect the price of tickets but something like attendance would. Another reason why previous studies concluded that salaries may not have significant impact on ticket prices could be that the teams are only allowed to pay their players so much each year because of the

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presence of salary caps. This could possibly cause the salaries variable to be insignificant because the amount teams can pay is predetermined by contract, and they are not able to exceed or fall below a given cap or floor. We surmise, then, that the cost to pay players could potentially already be calculated in the ticket price. Nonetheless, our date show that, at least for the NFL, player salaries do have a significant impact on ticket prices.

Interestingly, as attendance increases, the prices of tickets tend to increase as well. This would make sense because it is consistent with the principles of supply and demand. As more people demand to see the games in person (attend) the ticket prices would increase. This would cause a shift in the demand curve that would result in ticket prices increasing. In businesses such as sport teams where there is little competition, their main objective is to shift the demand curve, not have a movement along the demand curve. This may be why the effect of attendance on ticket prices is significant but low. The team owners are more concerned with trying to shift the curve. The impact of the population of the area ties in with this also because as the density of the population increases, it would make sense for there to be a higher demand for tickets or an increase in attendance, which would increase the ticket prices as the model shows should happen. As a consequence, when the population increases, we should expect that to lead to a shift in the demand curve, and thereby lending to an increase in ticket prices! This may be why the population variable has a larger affect on ticket prices than attendance alone.

Furthermore, our model predicts that as Real GDP/Capita increases, ticket prices increase as well. GDP/Capita is basically a measure of the standard of living in that metropolitan area, and as GDP increases the standard of living for the people in the community also tends to increase. If the community's standard of living goes up, it would make sense for them to be able to spend more time and money pursuing hobbies and other leisure or recreation activities. This could result in a higher demand for tickets (the income effect), causing the team to decide to increase ticket prices.

Contrary to previous research, the variable 'new stadiums or renovated stadiums' did not have a statistically significant impact in the model. This may be due to the limited timeline of the study. There were very few new stadiums or renovated stadiums during the time period used, and this may have affected the results. This may also be why the variable 'winning percentage' is not significant either.

The discussion above must be highlighted further by connecting these outcomes to the explanations that may be given using the MRP (Marginal Revenue Product) theory to explain the connection between player pay and ticket prices. As Fort and others have argued, the MRP theory dictates that players can only earn more if either of two things happen: a) they become more productive (i.e. MP rises) or, b) fans increase their willingness to pay for the result. This

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implies that, an increase in fan willingness to pay would lead to an increase in the MR portion of the MRP, even though the marginal product (MP) part of MRP stays the same. It is no wonder that the effect of this situation, if true, is that players are more valuable than they used to be in the eyes of the fans. This means that owners will raise prices because fans are willing to pay more. As a consequence, player pay will rise as long as there is competition for their services between teams. This bidding process raises player pay. More directly, the reason players make more is that because of a change in some demand parameter (such as, income, population size, preferences, etc.) that has increased fans' willingness to pay!

CONCLUSION

In summary, using data from 2011 through 2016, this study found that player salaries do have a statistically significant if low effect on the price of tickets in the NFL. We conclude that if ticket prices increase, it is largely due to other variables, not just because of an increase in player wages alone. Obviously, the limited span of time studied is one weakness of this paper. We concede that this study could be improved and further research could be done. More data could possibly change the results if the years were to go back further in time, and if the regression included more variables than just the seven included here. Some other variables could be included may be the 'unemployment rate', the 'level of education', or the 'poverty rate'. There is significant potential for this study to yield more accurate and robust results with the inclusion of more years, and to further embellish the discourse regarding the subject. We aim to turn to that task in future investigations. Overall, however, our results are inconsistent with the hypothesis that player salaries do not affect ticket prices in the NFL for the period under study.

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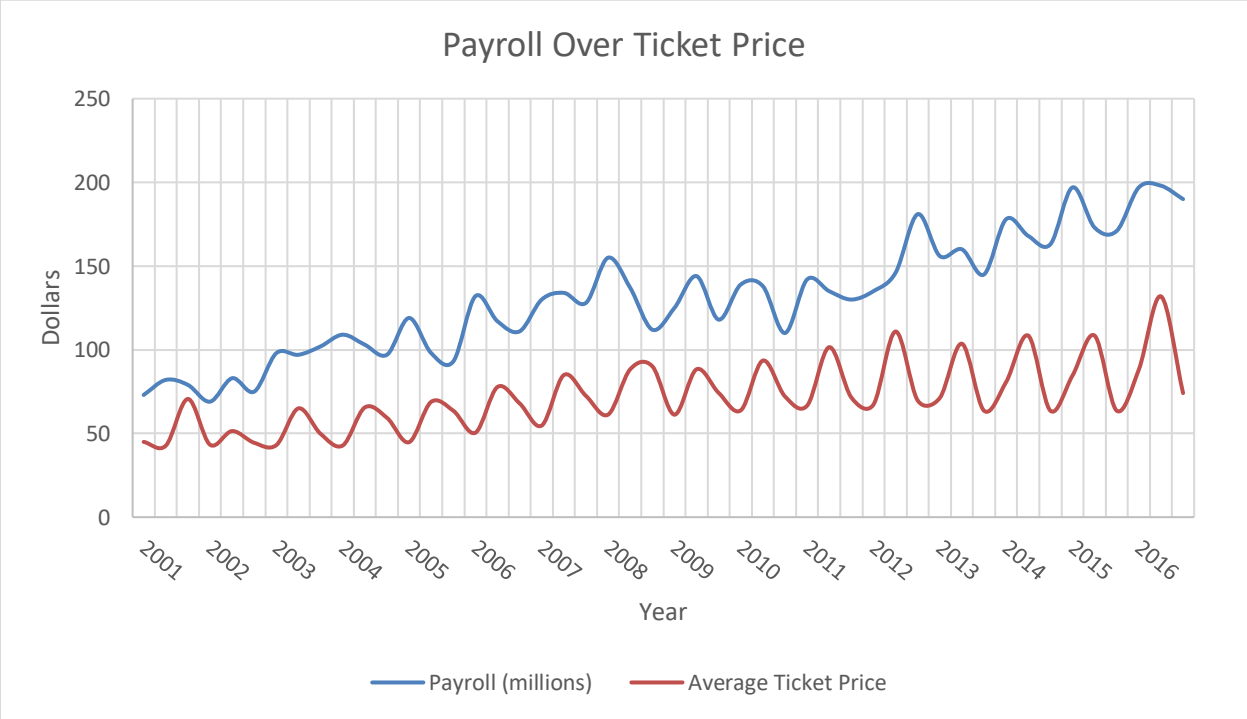
WHO'S AMERICA'S NFL TEAM? NIELSEN'S MEDIA EXPOSURE RANKINGS DETAIL THE TOP FOOTBALL FRANCHISE (2016, September). In *Nielsen*. Retrieved May 23, 2018.

Appendix 1



Player Payroll from 2001-2016. Graph from Statista Sept. 2017

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Appendix 2

NIELSEN'S NFL MEDIA EXPOSURE RANKINGS

RANK	TEAM	NATIONAL TV RANK	LOCAL TV RANK	NATIONAL APPEARANCE RANK	SOCIAL MEDIA RANK	WEBSITE RANK	OVERALL INDEX
1	DALLAS COWBOYS	1	15	1	2	1	187
2	GREEN BAY PACKERS	4	1	2	5	2	182
3	NEW ENGLAND PATRIOTS	3	6	6	1	3	179
4	DENVER BRONCOS	5	3	4	7	5	160
5	PHILADELPHIA EAGLES	7	16	3	4	7	149
6	PITTSBURGH STEELERS	10	7	11	3	4	144
7	SEATTLE SEAHAWKS	16	2	9	10	6	138
8	CAROLINA PANTHERS	2	12	13	6	8	127
9	NEW YORK GIANTS	11	30	5	9	11	126
10	DETROIT LIONS	13	19	8	18	15	112

Source: Nielsen

Methodology:
National - Average HH Ratings nationally for the 2015-2016 NFL regular season
Local - Average HH Rating in the team's local market for the 2015-2016 NFL regular season
Social - Average of total impressions on Twitter surrounding each team game
Website - Average of monthly unique audience for each team's official website from Sep 2015 - Jan 2016
Appearances - Based on total number of SNF (30%), MNF (20%), TNF (10%), Thanksgiving (30%), and Sun 4:25p (10%) games during the 2015-2016 regular season weighted according to level of exposure

Nielsen's NFL Media Exposure Rankings Graph from The Nielsen Company, *WHO'S AMERICA'S NFL TEAM? NIELSEN'S MEDIA EXPOSURE RANKINGS DETAIL THE TOP FOOTBALL FRANCHISE* (NIELSON 2016)

