Performance or Popularity? Examining What Determines NFL Player Salaries

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Abstract

The National Football League has grown from a simple game to a booming billion-dollar industry. For this reason, the league's athletes are now paid several million dollars a year to play the game. In this study, I try to determine what factors most strongly lead to higher average yearly salaries amongst NFL wide receivers and tight ends. This information is crucial to professional teams as they are investing millions of dollars in their athletes and must operate under a salary cap. Therefore they want to ensure that they are committing their investment to players with the right qualities. Generally, players are compensated based off of the on-field production that they produce. My study argues that there are additional, public perception factors that can predict a higher average salary amongst players. This is due to the fact that public perception of players helps fans to create a brand alliance with the team. The stronger the brand alliance fans have, the more likely they are to spend money and engage with the team. The results of the study indicate that both on-field production and popularity amongst the public have a significant positive impact on player salary. Therefore, when forming contracts, players should not only consider their talent, but also their public outreach and impact on the team's brand.

Introduction

In the modern age of the NFL, the sport has increasingly become more of a business rather than a game. This is reflected by the $18 billon, that the league generated in revenue in 2022 alone. However, the athletes remain the heart and soul of this business and, for this reason are compensated heavily. In recent years, an increasing amount of studies have used analytics to determine the driving forces behind player salaries. This is crucial information for professional teams to understand, as they are committing millions of dollars in investment into these athletes. Therefore, it is important to understand what variables are truly the most important, so teams can make educated investments that will be worth their cap space. Specifically, my study will target the 100 receivers and tight ends with the highest yearly salary. This is because different skill players have different roles, and therefore record very different stats. Several different production statistics will be used as variables to see which are the most effective in the player earning a higher

yearly salary. Player's contracts come in all different amounts and time lengths. Therefore, salary level will be assessed at an average yearly basis in order to ensure all are being compared equally. This differs from the majority of studies done in this topic as most research observes the length of a players contract rather then the average yearly value. Considering yearly statistics compared to average salary, will detail whether or not the player lived up to their contract expectation for the given year.

An additional aspect that is becoming increasingly prevalent in this type of research is fan engagement. The main driver behind the entire sports industry is fan passion and engagement. Without this engagement, teams would be unable to fund their massive facilities and contracts. Teams create brand engagement by forming strong brand alliance from consumers. Brand alliance is what brings spectators to attend games, drives TV viewership, and causes fans to spend money on merchandise and concessions. One of the main ways a team can form a strong brand alliance is by having players that are popular amongst fans. Therefore, my study will attempt to integrate public perception into the regression. When teams make deals with players, they must not only consider the production that they will bring on the field, but also how the player will help to build the team's brand and drive engagement. Considering these aspects of fan engagement is how my study will be unique and build upon previous literature. The first way this can be done is by considering the amount of followers that players have on social media platforms such as Instagram. Fan-to-player interaction across these platforms has become one of the main ways that teams have tried to create engagement in the past decade. Additionally, fans show their support for players by voting for them to be selected to Pro Bowl teams at the end of the season. Players are selected to the Pro Bowl team based off,

of performance as well as votes provided by fans. Considering there is not much deviation amongst player's performance at the top of the league, Pro Bowl selection is a good indication of popularity of the player. Finally, players can hurt a team's brand alliance by having a negative perception from the public. This can be caused by bad off field behavior or suspension from the league.

The objective of this study is to determine which of these factors are the main drivers behind the average yearly salaries of wide receivers and tight ends in the NFL. Previous studies in this field have examined how performance statistics and off-field behavior affect player contracts, but this study expands on these tests. It does so by considering social media influence that players have and how this interacts with salary levels. The study suggests that yards per season and the number of Instagram followers the player has provide a significant positive impact on average yearly salary.

Literature Review

Sport Analytics is a field of growing research and relevance in the sport industry, especially in regard to player salary. However, most studies consider the long-term aspects of player's contracts rather then their average yearly salary. Considering the average yearly salary is crucial as models using yearly statistics will indicate, whether or not an athlete met their production expectation for that season (Magel & Hoffman, 2015). All in all, sports are a performance-based business, and those that produce at the highest level are also compensated at higher levels. In 2005 a study was conducted which considered popular performance statistics which are well known to fans in order to determine the relationship to yearly salary of MLB players. Additionally, this study

highlighted the importance of controlling by player position and included several other variables having to with age, health, and post-season awards. The study established that performance based statistics are a strong predictor of average salary (Meltzer 2005). A further performance-based consideration for predicting salary has to do with the longevity of a player's career. A study conducted by Ducking et al. (2014) indicated that player experience (age and games played) has a significant positive impact on player salary.

In recent years, an increasing amount of literature has been published which details the importance that player popularity adds to a professional sports franchise. This has risen in interest due to its relationship with a team's brand alliance. Brand alliance is what drives passion and interaction from fans, which acts as the backbone for the sports industry as a whole. This brand alliance that fans create with teams and their players is the main predicator of ticket and merchandising sales, as well as TV viewership (Yang et al. 2009). A study conducted in 2018 aimed to predict what drives fan engagement with football clubs on Facebook. The study identified seven motivations for social media: information, entertainment, personal identity, social interaction, empowerment, remuneration, and brand love. Results found that brand love was strongly associated with the higher engaged categories of contribution and creation (Vale & Fernandes, 2018). Therefore, it is important to factor the value an athlete will add to the team's brand when structuring a contract. This is increasingly relevant with the meteoric rise of social media in our society over the past decade. Social media provides a new, dynamic marketing strategy for brands to grow their presence. Interaction with social media is crucial as it creates consumer engagement with the brand which branches thought the consumers

social group (Tsai & Men, 2013). Consumer engagement can be defined as, "the intensity of an individual's participation in and connection with an organization's offerings or organizational activities, which either the customer or the organization initiates" (Vivek et al. 2012). Social media has created a new and efficient avenue to produce consumer engagement online. In their paper "Examining Fan Engagement Through Social Networking Sights," Santos et al. (2018), detail three relationships in engagement: fan-to-fan relationship, team-to-fan relationship, player-to-fan relationship. Athletes who have a higher amount of social media followers are able to target all three of these relationships, and therefore create strong brand alliance.

An additional factor to consider when evaluating a players impact on the team brand is the public perception of the athlete. If the general public has a negative outlook on a player's personality, then they are less likely to engage with them and therefore support the team via viewership and consumption. If fans enjoy the personality of an athlete, they will be willing to buy tickets to see them play, turn on the TV to watch their games, and buy their merchandise. A reliable way to quantify the positive perception that fans have on a player is by consider their status as a pro-bowler (Yang et al., 2009). The NFL Pro Bowl selects a small margin of players each year to represent the league's best. However, unlike other sports, the NFL Pro Bowl considers fan votes. Therefore, in order to be selected for the Pro Bowl team, one must not only be productive, but also be supported by the fans. In result, players who have a negative public image are less likely to receive votes and be selected. Likewise, players' off the field behavior can have a negative impact on the public's image of the athlete. If the public holds the player in a negative light, they are likely to hold the team in a negative light as well, therefore

diminishing the value of the brand. This is demonstrated by the fact that veteran players who have been involved in suspensions stay on the free agency market for longer periods of time (Allen, 2015).

Data and Data Analysis

This study currently provides 100 observations of wide receivers and tight ends; who had the highest average year salary in the 2022 NFL season. The dependent variable in this article is *Avg./Year* and tracks players' yearly salary of their contract. To account for the large variety in yearly salary, the log of this variable has been taken to change to a percentage change rather than a unit change (l*nAvgYear*). The data for this variable comes from "Over the Cap," a website which lists the contracts of professional athletes at all different positions. This data is high quality as it is up to date, complete, and accurate. Yearly salaries range from $2,590,000 to $30,000,000 (14.77 to 17.22 logarithmically).

The independent variables of *Gamesplayed* and *Age* also come from "Over the Cap." *Gamesplayed* tracks the amount of games that each athlete participated in over the season. Therefore the data ranges from 3 to 17 games with an average of 14.3. The variable *Age* represents the age of each player ranging from 23 to 35. This data is high quality as it is accurate, up to date, and relevant to the study.

The next sets of data are the five independent variables that track player production. These include *Rec* (total receptions), *Yds* (total yards), *YR* (yards per reception), *TD* (total receptions), and *FirstD* (First Down conversions). This data was collected from "Pro Football Reference" which tracks player's statistics over the course of a season. This data is high quality as it is accurate and the most up to date statistics for

these players. Some of these data points are too similar too each other (such as *Yds* and *FirstD*) and therefore can skew the results of the regression.

The independent variable *IGFollowers* quantifies the numbers of followers each player has on Instagram. To account for the large variety in the data, the log of this variable (*lnIGFollowers*) will be considered in the regression, so that a percentage change is considered rather than a unit change. This data was collected directly from the athlete's social media pages. Due to the fact that one's amount of followers can change every second, the data is not completely accurate or up to date, but will serve the purpose of this study.

The final two variables in this study are the dummy variables *ProBowl* and *Suspension*. The variable *ProBowl* indicates whether or not the athlete has been selected for the Pro Bowl in the past three seasons. *Suspension* indicates if the league or his team, in the athlete's professional career, has ever suspended a player. All the data for the variables is made available and was collected on the National Football League official website.

Methods

In order to predict what factors determine average yearly salary amongst Wide Receivers and Tight Ends in the NFL I employ the following regression equation:

reg *lnAvgYear ln1IGFollower Gamesplayed Age Yds YR TD ProBowl Suspension*

The model will use a multiple linear regression in order to determine what variables drive average yearly salary. The model consists of three fields, which determine the overall salary of the player: reliability and durability, performance factors, and player

popularity measures. There are multiple different factors included when team and players determine contract values. Reliability and durability, and the performance factors are used to determine the impact the player will have on the field through both their availability and performance. Player popularity measures are used to determine the added value to the team brand that the players bring.

The dependent variable in this study is *lnAvgYear* and represents the yearly average salary considered on a percentage basis. Player's total salary can vary significantly based off of the amount of years their contract entails. Highly skilled players are likely to receive long-term high value contracts, while "role" players usually sign short-term contracts. In order to control for this, the average salary of the players contracts is used in order to compare across the market. The natural log expresses the percentage increase or decrease from the baseline average salary.

In the regression, *Age* and *Gamesplayed,* are included to consider the reliability and durability of the player in consideration with their contracts. The variable *Age,* represents how old the player is in years, ranging from 27 to 35. The expected coefficient values for this variable are ambiguous as there is a wide variation in correlation between age and contract value. Some players may receive long-term contracts early in their career, which will cause them to have high average salaries even as they approach the end of their playing career. Likewise, some players may accept lower value contracts, as they know they are approaching the end of their career and wish to play for a specific team or city. *Gamesplayed* determines the amount of games out of 17 that the player participated in during the season. Players are mainly paid in order to play football games, and therefore, those who are on the field more, and not sidelined due to injuries, will be

compensated with higher contract values. For this reason, this coefficient is expected to have a significant positive impact on the dependent variable.

Yds, *YR*, *TD* were included in the regression to track players performance based stats in the 2022 season. These three variables represent the three main functions that Wide Receivers and Tight Ends have in the game of football. That is to gain yards, complete catches, and score touchdowns. The evolution of game plans, especially in recent years, has made passing receivers the main weapons for the majority of offenses in the NFL. Therefore, these players must produce efficiently in order to receive higher paying contracts. Each player's performance statistics are considered relative to the other athletes in the study and then compared to their average yearly salary. Due to their crucial nature in the outcome of the on field performance of the team, these variables are expected to be significantly positive.

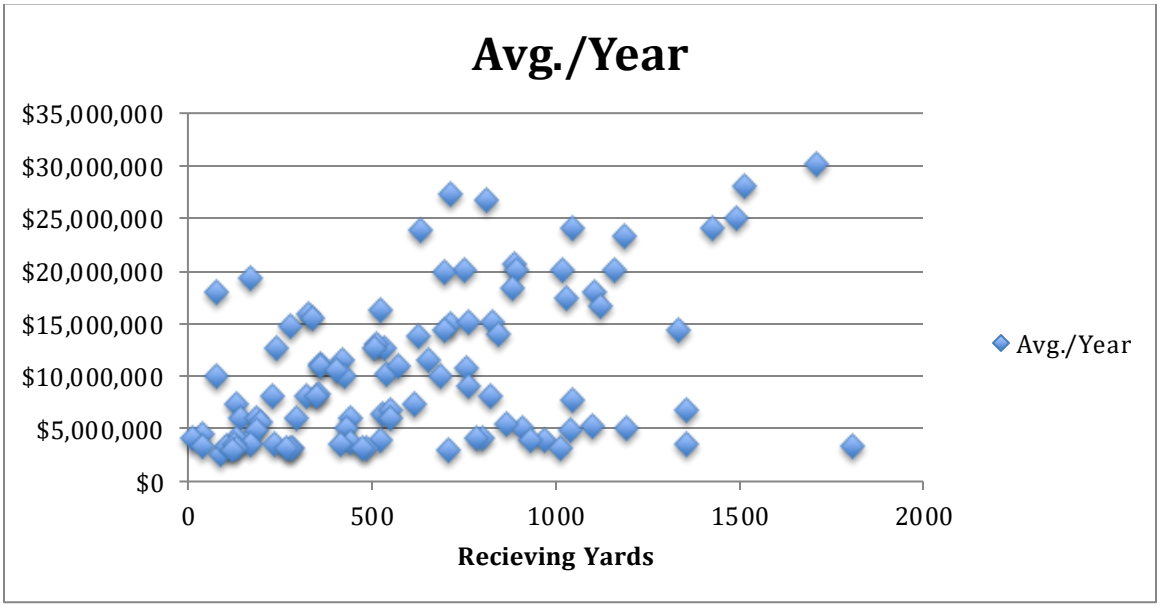
Figure 1: Correlation Matrix

	lnAvgY~r	ln1IGF~s	Gamesp~d	Age	Rec	Yds	YR	TD
lnAvgYear	1.0000							
ln1IGFollo~s	0.3904	1.0000						
Gamesplayed	0.0404	0.0770	1.0000					
Age	-0.0107	-0.1149	-0.2807	1.0000				
Rec	0.6044	0.3557	0.3195	-0.1553	1.0000			
Yds	0.6074	0.3518	0.3185	-0.1527	0.9525	1.0000		
YR	-0.0293	-0.0544	-0.0224	-0.0865	0.0072	0.1957	1.0000	
TD	0.5374	0.2985	0.2324	-0.0117	0.7580	0.8075	0.1316	1.0000
FirstD	0.6032	0.3544	0.2947	-0.1204	0.9536	0.9686	0.1307	0.8134
ProBowl	0.4232	0.2234	-0.0902	0.1194	0.4834	0.5060	0.0559	0.5024
Suspension	0.1955	0.1905	-0.1011	0.0499	0.2300	0.2386	0.0172	0.0937

The variables *Rec* and *FirstD* were dropped from the regression as they were too strongly correlated with the other performance variables. Figure 1 above shows the correlation matrix for the independent variables. Multicolinearity is indicated by values

that are close to one. The variables *Rec* and *FirstD* show evidence for multicolinearity with values greater than .95 in relationship to the variable *Yds*. Therefore, these two variables are not adding unique or independent insight to the regression and dull the effect of the other performance statistics. For this reason they were dropped from the regression equation

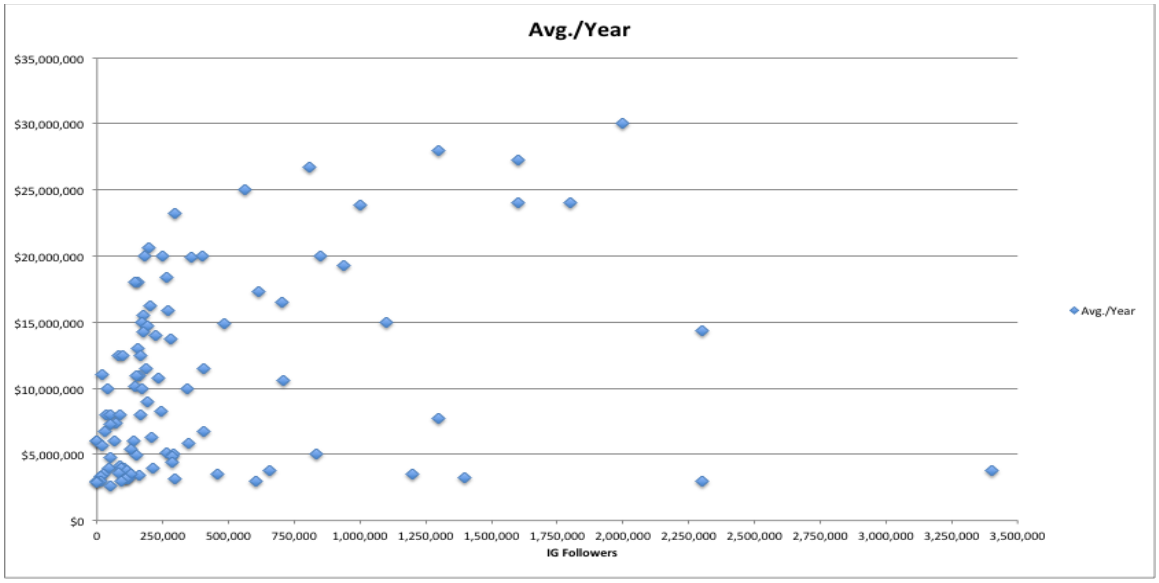
Figure 2: Dispersion of Total Yards compared to Avg. Salary



ProBowl, Suspension, and ln1IGFollowers, are the three independent variables that represent player popularity and perception from the public. Players are selected to the Pro Bowl based off of votes provided by fans. Therefore, the variable is a good representation of the player's popularity amongst the public. Selection to the past three Pro Bowls were considered, with the value increasing by the value of 1 for each year the player was named to the team. The variable *ln1IGFollowers* represents the percentage increase or decrease from the baseline level of Instagram followers of each player. Social media has become an integral part of society in the past decade, and is the forum where most people interact with their favorite players. Therefore, public support of the athlete

can be determined by their quantity of followers, which helps form their personal brand, and in turn strengthens the brand alliance of the team. Figure 2 displays the data of Instagram followers compared to average yearly salary values. The value of the coefficients *ProBowl and lnIGfollowers* is expected to be significant and positive due to its direct correlation of fan support. Suspension acts as a dummy variable and indicates if a player has received a suspension in their career. The value of 0 is assigned to players who have never received a league suspension and the value of 1 assigned for players who have been suspended by the league. The expected coefficient value for this variable is ambiguous as severity and reason for suspension can vary widely and therefore the change in public perception is not binary.

Figure 3: Dispersion of Instagram Followers compared to Avg. Salary



Results/Estimation

Table 1: Summary Statistics

. sum

Variable	Obs	Mean	Std. dev.	Min	Max
Gamesplayed	100	14.49	3.286013	3	17
Age	100	29.04	2.145797	26	35
AvgYear	100	1.01e+07	7554982	1317500	3.00e+07
Rec	100	45.57	28.25649	2	119
Yds	100	541.38	371.0636	13	1710
YR	100	11.869	3.46992	6.5	35
TD	100	3.3	2.900714	0	14
FirstD	100	26.56	18.41844	0	78
ProBowl	100	.2	.4020151	0	1
IGFollowers	100	363969	574017.2	0	3400000
Suspension	100	.07	.2564324	0	1
ln1IGFollo~s	100	11.44743	2.92415	0	15.03929
lnAvgYear	100	15.80046	.8566904	14.09125	17.21671

As per Table 1 Average yearly salary has a very wide range between $1,317,500 and $30,000,000 at the maximum, averaging out at around $10,000,000. In this study *AvgYear* is considered logarithmically and therefore the mean *lnavgyear* is 15.8% with a minimum value of 14.09% and a maximum of 17.21% and a standard deviation of .857%. The *Age* of athletes in the study ranges from 26 to 35 and averages at about 29 years old. The main performance statistic of yards has a very large range with a minimum value of 13 and a maximum value of 1710 yards for the season. The mean value for yards per season is around 540 and has a standard deviation of about 370. The variable *TD* has a relatively small mean of 3.3 considering it has a minimum value of 0 and a maximum value of 14. *Probowl* and *Suspension* act as dummy variables, but have relatively low means of 0.2 and 0.07 respectively. This indicates that there are a small number of athletes in the study who were selected to the Pro Bowl or were placed on suspension by

the NFL. The variable *ln1IGFollowers* holds a minimum value of 14.09% and a maximum value of 17.22%. This variable averages at 15.80% with a standard deviation of 0.86.

Table 2: Regression Results

Source	SS	df	MS	Number of obs	=	100
				F(8, 91)	=	9.56
Model	33.1858694	8	4.14823367	Prob > F	=	0.0000
Residual	39.4720551	91	.433758847	R-squared	=	0.4567
				Adj R-squared	=	0.4090
Total	72.6579244	99	.733918428	Root MSE	=	.6586

lnAvgYear	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
ln1IGFollowers	.0509201	.0247442	2.06	0.042	.0017688	.1000714
Gamesplayed	-.0385307	.0232059	-1.66	0.100	-.0846264	.0075651
Age	.0115699	.0334454	0.35	0.730	-.0548652	.0780049
Yds	.0012168	.0003534	3.44	0.001	.0005148	.0019187
YR	-.0340361	.0198667	-1.71	0.090	-.0734989	.0054267
TD	.0229789	.040933	0.56	0.576	-.0583294	.1042872
ProBowl	.1494437	.2083363	0.72	0.475	-.2643908	.5632783
Suspension	-.0082411	.2813022	-0.03	0.977	-.5670133	.5505311
_cons	15.07998	1.195729	12.61	0.000	12.70482	17.45515

In order to control for heteroscedasticity two separate tests were conducted. The first test was done graphically by plotting the regression results on a scatterplot. The graph showed no specific pattern, indicating that the model maintains homoscedasticity. The second test was done by conducting a Breusch-Pagan test for heteroscedasticty. With a P-value of 0.5614 being greater than 0.05, the null hypothesis of constant variance can be accepted. Theses tests indicate there is no presence of heteroscedasticity and defend the usage of a multiple linear regression.

The reliability and durability factors returned unexpected regression results as both showed to be insignificant in their effect on average yearly salary. In regard to *Gamesplayed*, this is likely due to the fact that player contracts are formed based on

previous seasons and durability throughout career. Though missing games in the 2022 season could indicate a player has a history of struggling with injury, this may have been a first time or unfortunate reason for missing games that would not be factored into contracts that were previously formed. The relationship with *Age* is likely due to the fact that players receive contracts at various different ages. There are two main reasons why this occurs. First, players "peak" or maximize performance at different point in their career, and in turn receive contracts at different ages. Secondly, athletes enter the NFL at varying different ages, mostly based off of their success in college football.

Amongst the player performance statistics only *Yds* resulted in a significant positive effect on average yearly salary. The regression displays a coefficient of .0012, meaning that for each extra yard a player gains in a season, their yearly salary increases by .12%. Therefore, an increase of 10 yards indicates a 1.2% increase in salary and another 100 yard increase on the season total, leads to a 12% expansion in the yearly average salary. Considering that many top receivers record 100 yard games often throughout a season, total yards is crucial to the compensation level of pass receivers. Though the overall goal of the offense is to score points, the majority of their focus is moving the ball down the field by gaining yards to increase scoring opportunities. Therefore, yards gained can be seen as the highest level of production and most important statistic when considering compensation levels. Variables *TD* and *YR* provided unexpected regression results as they were seen to be insignificant. For *TD* this is likely due to the fact that the majority of touchdowns in the NFL are scored closer to the goal line. Receivers are used as weapons in the open field in order to move the ball, however when teams enter the "red zone," touchdown specialists and running backs are generally

utilized more than receivers, and therefore score more touchdowns. Though scoring is a crucial part to the game, it does not make sense for teams to compensate players that are only used in specific situations that occur a few times a game, rather then receivers who are utilized throughout the field of play. The insignificant relationship for *YR* could be explained by the fact that players, who are paid the most, are also targeted the most and often have the most receptions. Therefore, their yards per reception could be skewed relative to lower paid players who may have a few explosive plays per game but low receptions.

Amongst the player popularity factors, *ln1IGFollowers* proved to have a significant positive impact on average yearly salary. The logarithmic average of this data was considered, meaning that a doubling in Instagram followers leads to a 5.1% increase in the yearly salary of the athlete. This relationship speaks to the social landscape in recent years changing its focus to online interaction through social media platforms. Player's who have a larger outreach on social media, connect with a higher level of fans, and in turn create a stronger brand alliance for the team. This is important to teams, as social media culture increasingly becomes part of daily life especially amongst the younger ages of fanbases. The regression shows that player contracts factor in this relationship and that on field performance is not the sole determinant factor of yearly salary. The variable *Probowl*, unexpectedly reported an insignificant effect on salary. In my estimation this is likely due to the fact that there are only a limited amount of roster spots for the Pro Bowl team. Therefore, players may have performed extremely well in the season, and may be very popular amongst the public, but were simply unable to beat out the other top players for the limited selection spots. *Suspension* was expected to have

an ambiguous effect and therefore it's insignificant effect is not abnormal. This is likely due to the fact that suspension can occur for various different reasons and therefore does not have a concrete outcome on public perception. If a player's off field behavior is significant enough to truly turn their popularity amongst the public, it is likely that they banned from the league entirely.

Robustness checks were performed to determine the strength of the significant variables. First the same regression equation was run, however, the non-logged salary was used for the dependent variable. Regression results indicated that both *ln1IGFollowwers* and *Yds* have a significant positive impact on yearly salary. Next, *Age, YR, TD, and Suspension* were dropped from the equation. Once again *ln1IGFollowwers* and *Yds* proved to have a positive significant impact on year salary. These tests show that the two significant variables are robust and not influenced by outliers.

Conclusion

This study aimed to identify what factors most strongly drive the average yearly salary of NFL players, specifically amongst wide receivers and tight ends. This is key information for teams and players alike to consider, as their contracts deal in multiple millions of dollars. In the regression three separate fields that factor into the salary level of contracts were considered. These are player reliability and durability, performance statistics, and popularity amongst the public. Though a variety of research has been done on predicting athlete salary, this study is unique in the fact that it considers public perception. This is crucial as players not only represent themselves, but also the teams they play for, and in turn are directly related to team's brand. For this reason, teams are

willing to compensate players who have a positive impact on the team brand more, then they would based solely of their on-field performance. The results of the regression indicate that a player's total yards in the season and their amount of Instagram followers has a significant positive impact on the level of their average yearly salary. These relationships have a number of policy implications for both teams and players. When considering production and talent of player's, the study suggests that teams should not focus on what player scores the most, but rather what athlete is gaining the most amounts of yards. Though the objective is the score points, teams spend the majority of the game trying to gain yards in order to sustain drives and increase scoring opportunities. Therefore, teams should look to compensate players that will generate more production throughout the entirety of the game, rather then scoring which only occurs sporadically. On the other hand, players, and their agents, should be aware of this relationship for the purpose of negotiating contracts. This is especially true for lower profile players or athletes that are not necessarily well rounded, but are effective yard gainers. The same can be said for the relationship with Instagram followers. In the modern age, the social climate is increasingly moving toward digital interaction through the lens of social media. This is a huge opportunity that teams should look to take advantage of as they can increase their engagement with fans and form a strong brand identity. As detailed in the paper, this brand identity is what drives consumers to attend games, watch on TV, and purchase merchandise. Teams are inevitably linked with the players that they employ. For this reason, they should look to sign players who have a strong connection with fans on social networking sights, as this relationship will increase their brand alliance. For this reason, teams will be willing to pay players with higher social media followers more then

their peers at the same talent and production level. This impact is important for players and agents to consider, as focusing on growing their social media presence and interaction with fans, can lead to an increase in their salary. Additionally, the results indicate whether or not players are "living up" to their contract. The significant positive impact of Instagram followers indicates that Juju Smith-Schuster is the most "underpaid" receiver in the NFL. This is because he has significantly more followers then all other receivers, but has around the 70th highest salary. This shows that his contract is not considering the great impact he has to the team's brand. Likewise, DJ Moore can be considered the most "overpaid" receiver in the league. Though he is the 11th highest paid player in this study, he has a very low following of only 197,000 and recorded around 800 less yards then the league leader, while playing the same amount of games.

Some limitations to this study are the fact that contracts are formed of player's history and past performance across a number of years. Therefore, considering statistics from one particular season may not fully encompass all the factors that were considered when these contracts and compensation levels were formed. The study could be improved by utilizing statics from previous year, which determine salary. Additionally, there is some selection on the dependent variable as only the 100 receivers and tight ends with the highest yearly salaries are considered. This limits the results, as not all players who record the variables considered are included. By increasing the dataset to include all receivers and tight ends in the NFL, it is likely that more variables will become significant, especially the performance statistics. Finally, there may be better indicators of player popularity and outward signs of fan support, such as number of jerseys purchased and player merchandise bought. However, the data on this information is not available for

the majority of players, and therefore could not be considered. A possible addition could be the inclusion of fantasy football statistics, though these may strongly correlate with the existing production statistics.

References

Allen, W. D. (2015). The demand for younger and older workers: Patterns from NFL labor markets. Journal of Sports Economics, 16(2), 127–158. https://doi.org/10.1177/1527002512462583

Ducking, J., Groothuis, P. A., & Hill, J. R. (2015). Exit discrimination in the NFL: A duration analysis of career length. The Review of Black Political Economy, 42(3), 285–299. https://doi.org/10.1007/s12114-014-9207-9

Jepsen, C., Jepsen, L., Draisey, T., & Mahoney, J. (2021). Race and National Football League Player Salaries After Controlling for Fantasy Statistics and Arrests. Journal of Sports Economics, 22(4), 359–386

Leonor Vale & Teresa Fernandes (2018) Social media and sports: driving fan engagement with football clubs on Facebook, Journal of Strategic Marketing, 26:1, 37-55

Magel, Rhonda, and Michael Hoffman. "Predicting Salaries of Major League Baseball Players." International Journal of Sports Science, vol. 5, no. 2, ser. 51-58, 2015. 51-58, https://doi.org/10.5923/j.sports.20150502.02.

Meltzer, Josh. "Average Salary and Contract Length in Major League Baseball: When Do They Diverge?" 2005, Department of Economics, Stanford University, CA.

Soebbing, Brian, et al. "NFL Player Career Earnings and Off-Field Behavior." The Review of Black Political Economy, vol. 50, no. 1, 2023, pp. 81–96., https://doi.org/10.1177/00346446221076868.

Thiago Oliveira Santos, Abel Correia, Rui Biscaia, Ann Pegoraro, (2018) "Examining fan engagement through social networking sites", International Journal of Sports Marketing and Sponsorship, https://doi.org/10.1108/IJSMS-05-2016-0020

Tsai, W., & Men, L. (2013). Motivations and antecedents of consumer engagement with brand pages on social networking sites. Journal of Interactive Advertising, 13, 76–87. doi:10.1080/15252019.2013.826549

Yang, Yupin. "Estimating the Value of Brand Alliances in Professional Team Sports." Marketing Science, vol. 28, no. 6, 2009, pp. 1095–1111.

Vivek, S.D., Beatty, S.E. and Morgan, R.M. (2012), "Customer engagement: exploring customer relationships beyond purchase", Journal of Marketing Theory and Practice, Vol. 20 No. 2, pp. 122-146.