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THE ECONOMIC IMPACT OF NFL FRANCHISE RELOCATIONS

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ABSTRACT

This paper aims to determine the impact NFL franchise relocations have on the economies of both their new and former host cities, as well as the influence key economic and team-dependent variables play in these events. Overall, the goal is to build a regression model that analyzes the statistical significance of key variables against per capita income throughout a relocation event. The directionality and magnitude of any variables deemed significant were then further analyzed by determining the variable's linear relationship with change in per capita income growth following relocation. The scope of analysis was defined as the Metropolitan Statistical Area (MSA) of the city in question and was limited to a seven year period for each case, including the relocation year and the three years immediately before and after. Data was collected from a variety of sources, including the Bureau of Economic Analysis, the Bureau of Labor Statistics and various official team and league websites. Ultimately, It was determined NFL franchise relocations do have a statistically significant impact on per capita income, with franchise departures being economically beneficial and franchise additions being economically adverse. The magnitude of this impact was influenced by the relative success of the departing franchise and a "dilution effect" based on the number of other professional franchises present in the MSA.

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Chapter 1

Introduction of the Topic

The National Football League (NFL) has recently garnered significant attention with the relocation of several of its thirty-two franchises. Over the past four years, three franchises have changed host cities, drawing intrigue from fans, ownership groups and policy makers alike (Kerr, 2020). From a football perspective, reactions have been a mixed bag, with some fans bemoaning the loss of a beloved team, while others rejoice over the prospect of welcoming a coveted franchise to their city. However, from an economic perspective, what are the implications of these franchises changing hands? The purpose of this thesis is to explore the economic significance an NFL franchise relocation has on both its former and new host cities.

The NFL as a Business

The National Football League is a massive entity that garners international interest and holds immense sway over the United States media market. Today's NFL operates as a powerful business, with financial and economic implications that go far beyond just the sport played on the field. In the 2017-2018 season, the NFL generated $15B of revenue, distributing $8.1 of this revenue to its thirty-two franchise organizations (Soshnick, 2019). This revenue figure far outpaced other major American sports, with Major League Baseball a distant second place, generating $9.9 billion (Gough, 2020).

Additionally, NFL franchises themselves hold immense financial value. In 2012, only British Premier League club Manchester United held a valuation of over $2 billion

(Badenhausen, 2019). Today, all thirty-two NFL franchises have breached this threshold, with an average valuation of $2.57 billion (Fuller, 2018). Globally, more than half of the fifty most valuable sports franchises in the world are NFL franchises, with the Dallas Cowboys earning the distinction of most valuable sports franchise in the world with a $5 billion valuation in 2019 (Badenhausen, 2019).

Despite this rapid growth story, the financial juggernaut of the NFL shows no sign of slowing down, with league commissioner Roger Goodell publicly stating the league is targeting $25 billion in revenue by 2027 (Eckstein, 2020).

Dynamics of Franchise Relocation in the NFL

Since the AFL-NFL Merger in 1966 that formed the National Football League known today, the NFL has approved ten franchise relocations. In each of these instances, an NFL franchise has moved from one city to another, re-establishing and rebranding themselves in their new host city. Table 1 illustrates franchise movements that have been approved since the merger (Kerr, 2020).

Relocation Year	Former Host City	New Host City
1982	Oakland	Los Angeles
1984	Baltimore	Indianapolis
1988	St. Louis	Phoenix
1995	Los Angeles	St. Louis
1995	Los Angeles	Oakland
1996	Cleveland	Baltimore
1997	Houston	Memphis / Nashville
2016	St. Louis	Los Angeles
2017	San Diego	Los Angeles
2020	Oakland	Las Vegas

Table 1: List of Approved NFL Franchise Relocations

Initially, franchise relocations in the early twentieth century stemmed from poor attendance and revenue figures. However, as the market for professional sports gained steam, ownership groups increasingly began to pursue franchise relocations with an eye to higher potential returns in larger markets, rather than poor financial performance in their current city (Bowling, 1999). Today, competition among cities vying for a limited number of franchises has become fierce, with large market cities proposing massive capital investment, in the hopes of attracting and accommodating one of these coveted franchises.

When facing the prospect of losing their NFL franchise to another city, policy makers and constituents weight both the non-tangible and tangible benefits of hosting a franchise. Most strongly felt among the team's fanbase is the non-tangible, with the presence of a team

symbolizing the city's prominence in American culture, while serving as a rallying point for all members of the community (Bowling, 1999). However, the tangible, or economic benefit of hosting a franchise is less clear. Proponents emphasize the economic benefits of the franchise, citing job creation and revenue generation that resonates and multiplies throughout the community. Subsequently, proponents claim this economic benefit should be realized through an investment by the city and its taxpayers. This investment comes in the form of subsidizations: financing new stadium construction with tax revenues, offering tax exemptions and allowing the franchise to use stadium facilities rent-free (Rappoport, 2001). With the trump card of franchise relocation in their pocket, franchise ownership groups can use their influence over the city's fanbase as a point of leverage, in order to gain financial concessions from policymakers. Facing this prospect, city officials are often quicker to accept given economic projections and agree to substantial, publicly financed outlays, rather than risk losing their prized franchise.

Contentions of Franchise Impact Studies

While the NFL and franchise ownership groups cite impact studies purporting the impressive economic gains of hosting an NFL franchise, others have been quick to contest the validity of these claims. Individual studies cite oversights and inaccuracies in these impact studies that may artificially inflate economic figures. These individual studies argue that negative consequences such as increased taxes to finance stadium bonds, offsetting job losses in other industries, and the opportunity cost of taxpayer dollars, as well as overstated spending multipliers, must be addressed to determine the true economic impact of hosting an NFL franchise (Rappoport, 2001). Several of these studies found either negligible or, in some cases,

negative economic impacts associated with an NFL franchise, concluding the benefits of hosting a team do not outweigh the significant public investment required (Rappoport, 2001). Ultimately, the question itself has yet to arrive at a consensus answer. Which is more accurate: impact studies promoting NFL franchises driving positive economic impact, or individual studies stating key costs and variables have been ignored, while concluding franchises may, in fact, have little to no positive return on their required investment? Due to recent relocations following the conclusion of many of these studies, this thesis believes the question deserves re-examination using new data available from these cases.

Thesis Statement

After running a multi-variable regression analysis on key economic and team-dependent variables, the model will indicate that changes in per capita income can partially be explained by franchise relocation, with average win percentage and the number of other professional franchises influencing the magnitude of effect.

Chapter 2

Literature Review

Examination of Proponent Claims

In today's sports driven media culture, hosting an NFL football franchise is a sought-after distinction. Franchise residency is seen as a calling card of an influential U.S. city, with the team serving as a rallying point for its citizens. However, while many U.S. cities have experienced rapid growth in recent years, the number of NFL franchises has largely remained limited, sparking fierce competition to attract and retain these coveted franchises. This arms race has largely manifested itself in the construction of huge stadiums and team facilities, with public funding shouldering a large portion of the cost. Throughout the 1990's, the average new football stadium cost $325M, with the public financing an average of sixty-two percent of the cost (Rappaport, 2001). These costs have only increased, as cities vie to build bigger and better stadiums for their respective franchises.

The justification from ownership groups and franchise proponents for this large public investment is the subsequent economic benefit these franchises generate. In 1995, when attempting to convince Jacksonville, Florida taxpayers that an NFL expansion team was a worthwhile investment, the team ownership group claimed the team would add an average of $130M a year to the city's economy, while creating 3,000 jobs (Baade, 1996). In 1993, lobbying for use of public funding for a stadium renovation for the Arizona Cardinals, one impact study projected an increase of $260 million in annual income for the city of Phoenix as a result of the project (Baade, 1996). Even as recently as 2015, a third party consultant group stated a $1.6B stadium construction in Carson County, Los Angeles would generate $2.6B and support more

than 16,000 jobs over its four year development period, then contributing $433M and supporting 6,700 jobs annually (LAEDC, 2015).

If these franchises drive as much economic impact as ownership groups and proponents claim, one would expect a consensus viewpoint, supporting a significant and measurable impact on the economy of a new host city, as well as the on former host city. However, this is not the case.

Independent Study Findings

While evidence and claims from impact studies commissioned by ownership groups point to significant economic benefit for a metropolitan area stemming from franchise relocation and retention, studies conducted by economists and academics have often concluded otherwise. Several event studies and regression analyses on economic figures of cities with sports franchises have found that, in many instances, sports franchises have a largely negligible impact on the economy of the cities that host them.

In a study conducted in 1996, Robert Baade concluded that, in large cities, sports franchises account for only a fraction of the city's overall income. Examining the city of Chicago, commercial sports accounted for only .24 percent of total personal income, despite being home to five professional sports franchises (Baade, 1996). This marginal figure made it unlikely that commercial sports would influence any significant economic effect when taking into account the entire metropolitan area. Applying this logic to other host cities and utilizing a regression model to examine the economic impact of cities either gaining or losing stadiums and

sports franchises, Baade found no positive correlation between professional sports franchises and real per capita income or job creation (Baade, 1996).

In a study conducted in 2007, Lertwachara and Cochran also used a regression model to examine the impact of sports franchise relocation or expansion on per capita income and growth rate. However, they did so while accounting for variables they believe were ignored in previous studies: the overall US economy, macroeconomic influence on a city's key industries, comparisons of events occurring at different points in time, and direction of causality (Lertwachara, 2007). They concluded that, in comparison to similar metropolitan areas without professional sports franchises, the addition of a franchise had either an insignificant or negative impact on economic growth, dependent on the type of sport (Lertwachara, 2007).

Similarly, in a 1999 study, Coates and Humphreys conducted a regression model study examining per capita income in thirty-seven metropolitan areas in relation to a wide variety of sports related events, such as stadium construction, stadium usage and franchise relocations. They concluded sports franchises had a negative impact on per capita income and negligible impact on per capita income growth, explaining these results through residents' willingness to accept lower levels of income in exchange for the non-tangible benefits of a sports franchise, as well as the opportunity cost of taxpayer dollars utilized for franchise-related expenses (Coates, 1999).

Finally, while many precedential studies focused on the impact incoming or resident teams have on their host cities, Jesse Stephenson examined the impact sports franchises have when leaving host cities. This study takes into account fourteen sports franchise relocations over a forty-year horizon, utilizing a regression model to determine the impact on per capita income and unemployment rate in the three years before and three years after a relocation. The study

concluded there was no measurable negative impact or statistically significant effect on the metropolitan economy caused by the relocation (Stephenson, 2014).

Alternative Considerations

While these studies all use similar research methods and analysis, the discrepancies in time horizon, data selection and variables chosen illustrates the point that, in examining a complex topic such as a metropolitan economy, with wide range of potential predictors and influencers, there are always alternative considerations and assumptions to make when building a model. Incorporating alternative variables into a model may affect the outcome, while supporting contrary conclusions or justifications.

For instance, in a 2008 study, End and Davis examined the economic impact of NFL franchises when taking team success into account, quantified by win percentage (End, 2008). This study was prompted by evidence in a previous study by Coates and Humphries, suggesting that a Super Bowl victory for an NFL team had a positive impact on the personal income of individuals in its host city (Coates, 2002). Again utilizing a regression model, End and Davis concluded that winning percentage had a positive impact on real per capita income of a host city, as well as its growth rate (End, 2008). This conclusion was justified using a psychological approach and demonstrated diminishing returns after a threshold of eleven wins (End, 2008). However, End maintains there are concrete economic effects associated with maintaining a competitive NFL franchise, and this should be taken into account by policymakers (End, 2008).

Additionally, in his New York Times article, Ken Belson argues that, while the NFL has attempted to drive increasing revenues through franchise relocations to larger markets such as

Los Angeles, they may experience unintended consequences. When the Los Angeles Chargers relocated from San Diego in 2017, their franchise valuation doubled (Belson, 2017). However, they now reside in a market with eleven professional franchises and two large Division One college programs, and subsequently have to compete for a limited share of media attention and commercial sports revenue. While Los Angeles is undoubtedly a larger market than San Diego, the Chargers' revenues could potentially be cannibalized by the plethora of sports teams saturating the market (Belson, 2017). This may already be taking effect, as the Chargers attendance numbers fell from nineteenth in the league in 2015, to dead last during the 2017-2019 seasons (ESPN, 2019). This oversaturation effect can be built into models by taking into account the number of professional franchises present in a city and may be used to analyze findings.

Unanswered Questions

Overall, an examination of precedential literature reveals the contentious nature of the topic. On one hand, there are impact studies, commissioned by franchise ownership groups, asserting the substantial economic benefits NFL franchises have on their city's economy. On the other hand, however, are independent economic studies, contesting the methodologies and conclusions of these impact studies.

As with any complex and divisive research question, there are several alternative considerations and variables that this thesis believes should be examined to further the research on the economic impact of NFL franchises. First, many studies have examined all professional sports in conjunction, rather than limit their scope to strictly NFL franchises. As undoubtedly the

largest and most influential of the United States' professional sports leagues, this thesis maintains the NFL justifies its own examination, independent of the influence of other leagues.

Next, the majority of studies focus on the impact either incoming or active franchises have in their current host city. This thesis proposes, to truly gauge the impact of franchise relocation, the scope of examination must include a lead-lag analysis of both the former and new host city, in order to observe overall economic impact and the directionality of indicators in both cities following relocation.

Finally, due to the complex nature of economic analysis, adjustments can be made to prior regression models, taking into account factors that may have been overlooked. Variables such as winning percentage and oversaturation of the market have been largely ignored. However, evidence suggests they may have a significant effect on franchise impact and should be incorporated into a regression model.

Chapter 3

Data Methodology

This thesis proposes the construction of a predictive regression model to determine the economic effect NFL franchise relocation has on its former and new host cities, as well as which variables most greatly influence this effect. To do so, relevant economic and sports environment data was collected from various city pairings that had experienced franchise relocation in the modern NFL era. This data was then used in a regression model with per capita income used as the dependent variable, while controlling for general, time-based economic trends. Finally, the overall significance of the relocation, as well as the level of significance of each variable was interpreted respectively against all other cities with franchises either leaving or arriving, as well as on a national level.

Case Selection

First, the scope of analysis was limited to relocation cases following the 1966 AFL-NFL merger, which formed the modern National Football League we know today. Cases prior to this merger were omitted, in order to select data most representative of modern-day economic influences and NFL dynamics. This criteria pared potential data down to ten viable instances of franchise relocation, as illustrated in Table 2 (Kerr, 2020).

Relocation Year	Team	Former Host City	New Host City
1982	Raiders	Oakland	Los Angeles
1984	Colts	Baltimore	Indianapolis
1988	Cardinals	St. Louis	Phoenix
1995	Rams	Los Angeles	St. Louis
1995	Raiders	Los Angeles	Oakland
1996	Browns / Ravens	Cleveland	Baltimore
1997	Oilers / Titans	Houston	Memphis / Nashville
2016	Rams	St. Louis	Los Angeles
2017	Chargers	San Diego	Los Angeles
2020	Raiders	Oakland	Las Vegas

Table 2: Post-Merger NFL Franchise Relocations

However, several additional cases had to be excluded due to various externalities, in order to create a consistent data set. The 1997 Houston Oilers relocation was omitted from the data, as the team temporarily moved to Memphis, Tennessee for one year before permanently relocating in Nashville, Tennessee as the Tennessee Titans. This two-step relocation could potentially disrupt the measurable economic impact the relocation had, while also expanding the scope of impact beyond that of one metropolitan area. Additionally, both the 2017 San Diego Chargers' relocation to Los Angeles and the 2020 Oakland Raiders' relocation to Las Vegas were omitted, as economic data was not available in the three years following relocation, providing an insufficient time horizon to fully measure the economic impact following

relocation. Additionally, preceding the Chargers' move was the St. Louis Rams' 2016 relocation to Los Angeles, which could potentially skew the economic data collected for the Chargers.

Geographic and Time Horizons

Once the relocation cases and respective cities were selected, geographic and time horizons had to be defined in order to isolate data best suited for franchise impact analysis. Geographically, the scope of analysis was confined to Metropolitan Statistical Area (MSA) of the city in question. An MSA is geographically defined by the government and contains a high population urban center, together with adjacent communities with high economic and social integration to the center (U.S., 2018). By including the geographic area that lies outside of the heart of the city, yet is still directly influenced, the economic impact a relocation has on the entire population can be observed. Additionally, the scope of analysis was confined in terms of years surrounding a relocation. For each relocation case, seven years of data were analyzed for each city: the three years before relocation, the three years following relocation, and the relocation year itself. This lead-lag analysis, centered around the year of relocation, will observe the immediate impact the move has on the economy, while capturing any residual impact experienced in subsequent years.

Regression Model and Variable Selection

This thesis utilizes a regression model as a means of analysis because of its ability to measure the degree to which one dependent variable is related to multiple predictor variables, quantifying the level of significance these predictor variables have on the dependent variable.

The regression model utilized will follow the format of a traditional multivariable regression equation:

$$Y = b_0 + b_{1,m,t}X_{1,m,t} \ldots + b_{n,m,t}$$

Where Y is the response variable, b_0 is a constant factor, X is an independent predictor variable for its given MSA (m) in the relevant year (t), paired with a coefficient b estimated through running of the regression model.

The dependent response variable used in the model is per capita income at the MSA level, which has been utilized in several precedential studies as a proxy for the local economy (Lertwachara, 2007). This dependent variable is run in the model to determine its relationship to a variety of key economic and team-specific predictor variables. The independent predictor variable utilized in the model are population on the MSA level, win percentage and the number of other professional sports franchises present in the MSA.

Population was selected in an attempt to mitigate bias stemming from unknown or omitted variables that may affect MSA growth, as population can explain a large fraction of overall changes in income (Baade, 1990). Additionally, population standardizes comparisons across MSA's of different sizes, which may be subject to varying income levels and growth rates.

Win percentage was selected to determine the level of significance either adding or losing a winning team has on the economy of a city. This variable was included after precedential studies concluded seasonal success, quantified by winning percentage, had a significant positive effect on per capita income (End, 2008).

The number of other professional sports franchises present in the MSA was selected to determine the significance of a dilution effect theorized in other studies and articles where adding a franchise to an already saturated sports market creates diminishing returns. The number of other franchises included franchises among the four major sports leagues in the United States, the National Football League (NFL), Major League Baseball (MLB), the National Basketball Association (NBA), and the National Hockey League (NHL). This variable did not include major NCAA Division One programs. However, this thesis recognizes that, in some instances, these programs command significant media and fan attention in their respective city.

Finally, two additional trend variables were created which, similar to precedential studies, controls for any economic trends occurring independent of the influence of a franchise relocation (Baade, 1990). First, a before trend variable was created, assigning the numbers -3, -2, -1 to the three years preceding a relocation, with the relocation year and subsequent years being assigned a 0. Then, an after trend variable was created, assigning the numbers 1, 2, 3 to the three years following a relocation, with the relocation year and all years prior being assigned a 0 (Stephenson, 2014). The inclusion of trend variables allows the regression model to test an MSA's per capita income against external economic trends, assigning a level of significance to this relationship.

Data Collection and Formatting

Economic and team data were compiled from a variety of sources. MSA per capita income and population figures were both collected from the Bureau of Economic Analysis (BEA). Per capita income on a national level was also collected from the BEA for use in data

analysis. The BEA provides a comprehensive interactive data tool, with the ability to access specific data based on a number of filters, among them economic metric, specific MSA and time period. This data was then directly downloaded into Microsoft Excel, where it was tabulated accordingly. Win percentage and the number of other professional franchises present in the MSA was sourced from various official team and league websites, which provide comprehensive team history timelines and records of historical league standings. Finally, trend variables were subsequently assigned in Microsoft Excel, based on year respective to each franchise relocation. All data was collected in Microsoft Excel and tabulated by relocation case and subsequently by appropriate MSA.

Following collection of all relevant data, some data had to be adjusted to create a consistent and useful data set. First, all per capita income dollar figures had to be standardized to adjust for inflation. All dollar figures were converted from a midyear figure in their respective year to January 2020 dollars using the Bureau of Labor Statistics' CPI Inflation calculator. Win percentage was adjusted by finding the average win percentage of the franchise in the three years preceding relocation. This average figure was then applied for all seven years of the data set. This allows the regression model to test the effect either losing or gaining a team has on per capita income based on their historical success before the relocation.

After this data was adjusted and organized by city, it was combined in Excel into larger data sets to utilize as an input for the regression model. The data was compiled into three sets: one containing data from all cities, one containing data from MSAs adding franchises, and one containing data from MSAs losing franchises. These data sets were then exported into the statistics program Minitab Express, in order to run the regression model and conduct further analysis. Minitab Express was chosen because of its ability to perform multivariable regressions

on large volumes of data and to concisely produce regression equations, coefficient and p-value tables and collinearity analysis.

Data Analysis Methodology

Before running the regression model, certain threshold standards had to be set in terms of collinearity and statistical significance in order to conduct consistent analysis across data sets. Multicollinearity is the degree to which any variable is related to or can be predicted by the other variables in the model (Hair, 2014). Often times, some level of multicollinearity is unavoidable. However, multicollinearity in excess makes it difficult to accurately predict the variable's effect in the model. Multicollinearity is quantified by a variance inflation factor (VIF), which is calculated with the following equation:

$$VIF = \frac{1}{1 - R^2}$$

Where R_2 is a statistical measure of how close the data points are fitted to the regression line, serving as a proxy for how accurately the dependent variable is predicted by the independent variables in the model (Hair, 2014). A VIF measure of 1 indicates no multicollinearity for that variable, while a measure of 10 serves as a typical upward bound for multicollinearity (Hair, 2014). Any variable with a VIF greater than 10 likely cannot be estimated accurately and should be excluded from the model.

Next, a threshold was set for analysis of statistical significance. Statistical significance is analyzed using both variable p-values and an assigned alpha, which serves as a threshold for statistical significance.

In any regression analysis, there is always a null hypothesis. The null hypothesis is the concept that the sample or data set you are analyzing does not differ from a general population or randomized data set. A p-value is a means of quantifying how compatible your data is with the null hypothesis: the probability of obtaining a similar result, assuming the null hypothesis is true (Minitab, 2014). A high p-value means the data of that variable is likely consistent with the null hypothesis, while a low p-value means the data of that variable is inconsistent with the null hypothesis (Minitab, 2014). Typically, a level of significance, or alpha, is assigned to the study where, if a variable's p-value falls below this level, it is acceptable to reject the null hypothesis and conclude that variable has a statistically significant effect. Most commonly, an alpha level of $\alpha=0.05$ is selected for hypothesis testing (Kim, 2015).

Therefore, this thesis will utilize a hypothesis test with an alpha of $\alpha=0.05$ to test the significance of the relationship of each independent variable to per capita income. Additionally, the trend variables will be used to test the significance of the relationship of overall economic trends on per capita income. If the hypothesis test yields results where there is an absence of statistically significant relationships to per capita income not explained by overall trends, then it is safe to accept the null hypothesis (Baade, 1990). However, if one or more variables yield a statistically significant relationship while the trend variables do not, it is safe to reject the null hypothesis for these variables and conclude they have a statistically significant effect on per capita income.

These hypothesis tests will be run on all three data sets. In the event that the null hypothesis is rejected for one or more independent variables, further analysis will be conducted, isolating these variables for direction of causality. This analysis will be conducted by plotting the variable in question against both one-year and two-year change in per capita income growth rates

following the relocation. Utilizing growth rate rather than per capita income dollar figures allows for standardized comparison across cities of varying economic scale. A regression line and equation will then be generated on these data plots, utilizing a standard linear trendline equation:

$$y = mx + b$$

Where y is the dependent variable, x is the independent variable, m is the slope of the trendline and b is the y-intercept value. The sign of the slope value, m, provides directionality, while its absolute value provides the magnitude of the relationship.

Chapter 4

Data Analysis

The regression model was run on three different data sets: one containing data from all MSAs, one containing only data from MSAs adding franchises, and one containing only data from MSAs losing franchises. Analysis on the multi-variate regression output was done using a statistical hypothesis test. If a variable was found to be statistically significant, further analysis was conducted by examining the linear relationship between the variable in question and both the one-year and two-year average change in per capita income growth rate preceding and following the relocation. Justifications and conclusions were drawn from a combination of these analysis methods.

Analysis of National Economic Trends

Before running the regression model, per capita income on an MSA level was compared to National per capita income, in order to gauge the relationship and correlation of these two metrics. Figure 1 illustrates both MSA and national per capita income, plotted for each year of the total data set.

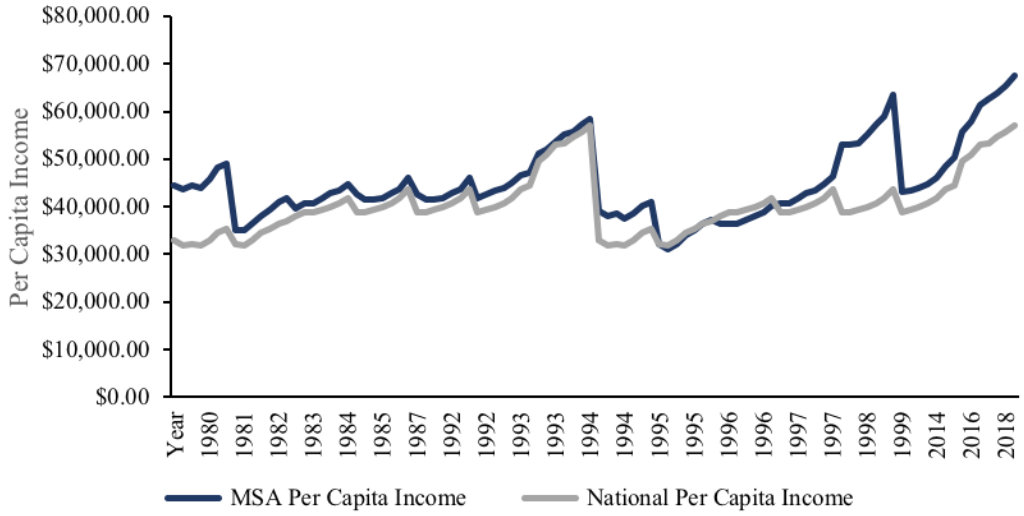

Figure 1: MSA Per Capita Income vs. National Per Capita Income

While figures for MSA per capita income are presented in thousands of dollars and national per capita income figures are presented in millions of dollars, it is important to note the apparent high level of correlation between the two metrics. This level of correlation can be analyzed further, by running a correlation test on both variables in Minitab Express. Table 3 shows the results of this correlation test.

Correlation Test: MSA Per Capita Income and National Per Capita Income

Pearson Correlation Coefficient	0.796442
P-value	<0.0001

Table 3: Correlation Test - MSA Per Capita Income and National Per Capita Income

A Pearson correlation coefficient indicates the strength and direction of a linear relationship between two variables. Potential values range from -1 to 1, with -1 representing a perfect negative linear relationship, 1 representing a perfect positive linear relationship and 0

representing no linear relationship (Minitab, 2019). The results of the correlation test serve to confirm the correlation illustrated in Figure 1. A correlation coefficient of 0.79 indicates a strong positive linear relationship, where one variable tends to rise in conjunction with the other. Additionally, the given p-value falls below the alpha threshold of $\alpha = 0.05$, validating that the correlation is statistically significant.

Interpretation of this data seems to point to a conclusion: changes in MSA per capita income seem to be intrinsically linked to changes in national per capita income. However, alternatively, the Pearson correlation coefficient also shows there is another roughly 0.20, or twenty percent, of change in MSA per capita income which is not explained by change in national per capita income. Additionally, it is important to keep in mind that correlation does not equal causation, and cause and effect cannot be deduced strictly through use of correlation tests. As such, further analysis is needed through use of the regression model.

Regression Model #1: "Complete MSA" Data Set

First, the regression model was run on the complete data set, containing data from all MSAs either gaining or losing franchises. Before running the regression, the VIF was calculated for all variables, in order to assess whether they fell below the assigned multicollinearity threshold of VIF = 10. Maintaining multicollinearity beneath this threshold ensures the model is able to accurately predict the overall effect of each variable. Table 4 illustrates the VIF output for each variable in the Complete MSA Data Set.

Variable	R_2	Variable Inflation Factor (VIF)
Population	77.80%	4.50
Number of Other Franchises	82.45%	5.70
Winning Percentage	37.36%	1.60
Before Trend	34.25%	1.52
After Trend	34.16%	1.52

Table 4: "Complete MSA" Data Set - VIF Output

For this data set, each variable has a VIF which falls below the VIF = 10 threshold. Therefore, it is safe to assume multicollinearity among variables is at an acceptable level and the effect of each variable is accurately predicted in the model. This result confirms utilization of the regression model can proceed using the given data and variable selection.

After running the regression model using the Complete MSA Data Set, the following results table was generated, as shown in Table 5.

Term	Coefficient	95% Confidence Interval	T-value	P-value
Constant	34776	(29791, 39760)	13.86	<0.0001
Population	-0.0006038	(-0.0012744, -0.0000668)	-1.79	0.0770
Number of Other Franchises	2624.8	(1003.8, 4245.8)	3.22	0.0018
Win Percentage	11114	(-1953, 24181)	1.69	0.0946
Before Trend	752.3	(-691.6, 2196.2)	1.03	0.3035
After Trend	1234.3	(-208.8, 2677.3)	1.70	0.0927

Observations	97
R_2	34.95%
R_2 (adj.)	31.42%

Table 5: "Complete MSA" Data Set - Results Table

Interpreting these results, the p-values of each variable were evaluated for statistical significance. First, it is crucial to note that the p-values of both the before and after trend variables are insignificant. Therefore, it is concluded that general economic trends had an insignificant effect in determining per capita income and the effect is explained, in some magnitude, by the relocation event and subsequent change in team-related factors acting on the MSA.

Next, further interpretation shows the p-values for population and win percentage are both insignificant, as they are greater than 0.05. However, the p-value output for number of other franchises, $p = 0.0018$, falls below the alpha threshold, indicating statistical significance. Concluding that the number of franchises present in the MSA is significant for the entire MSA

data set suggests efficacy for a dilution effect, where the magnitude of impact a franchise has on the economy experiences diminishing returns based on the presence of other franchises.

These results allow us to initially reject the null hypothesis, concluding that general economic trends alone do not account for the effect on per capita income while suggesting that the number of franchises present in the MSA have a significant effect on per capita income during a franchise relocation. However, these results do not illustrate the directionality or magnitude of any variable. Further analysis is required to determine these variable characteristics, while also testing whether variable significance is consistent across cases of franchises both arriving and leaving an MSA. As such, the regression model was run on two additional data sets, categorized by MSAs either adding or losing a franchise.

Regression Model #2: "MSAs Adding Franchises" Data Set

The regression model was next run on the data set containing data from all MSAs adding an NFL franchise during a relocation. First, the VIF was calculated to similarly verify the accuracy of the model. The results of the VIF calculation are shown in Table 6.

Variable	R_2	Variable Inflation Factor (VIF)
Population	75.61%	4.10
Number of Other Franchises	80.65%	5.16
Winning Percentage	39.46%	1.65
Before Trend	34.04%	1.51
After Trend	34.93%	1.53

Table 6: "MSAs Adding Franchises" Data Set - VIF Output

Analyzing the output for multicollinearity between variables, each variable's VIF is well below the threshold of VIF = 10, confirming the assumption that the effect of each variable is accurately predicted in the model. As such, again it is safe to proceed with the regression model using the given variables and data.

After running the regression model using the data set containing MSAs adding franchises, the following results table was generated, as show in Table 7.

Term	Coefficient	95% Confidence Interval	T-value	P-value
Constant	33739	(25743, 41735)	8.51	<0.0001
Population	-0.0003060	(-0.0013188, -0.0007069)	-0.61	0.5456
Number of Other Franchises	3397	(1202, 5593)	3.12	0.0032
Win Percentage	5610	(-15566, 26787)	0.53	0.5959
Before Trend	857	(-1440, 3154)	0.75	0.4558
After Trend	1022	(-1290, 3335)	0.89	0.3776

Observations	49
R_2	52.18%
R_2 (adj.)	46.62%

Table 7: "MSAs Adding Franchises" Data Set - Results Table

The results from this regression model are similar to that of the first. An initial key observation from these results is that, again, the p-values of both the before and after trend variables read as statistically insignificant. This supports the results from the Complete Data Set regression that the null hypothesis can be rejected and, in this case, concludes that a franchise relocating to an MSA has a significant effect on per capita income. Analyzing the results further, the p-values of both population and win percentage are insignificant, keeping with the results from the Complete Data set. Furthermore, the number of other franchises is again the only independent variable which recorded a statistically significant p-value. This level of significance again supports the idea of a dilution effect. However, now that data from MSAs adding

franchises has been segregated from the complete data set, this variable can be tested magnitude and directionality, in order to further support to the conclusion.

Further analysis on the effect the number of other franchises has on per capita income was conducted by determining the average growth rate of per capita income both preceding and following the relocation and calculating the difference between these two rates. This change in growth rate was then plotted against the statistically significant variable in question, in order to determine the directionality and magnitude of the relationship. Figure 2 illustrates these results, plotting the average number of other franchises over the seven-year relocation time horizon against a one-year growth rate differential.

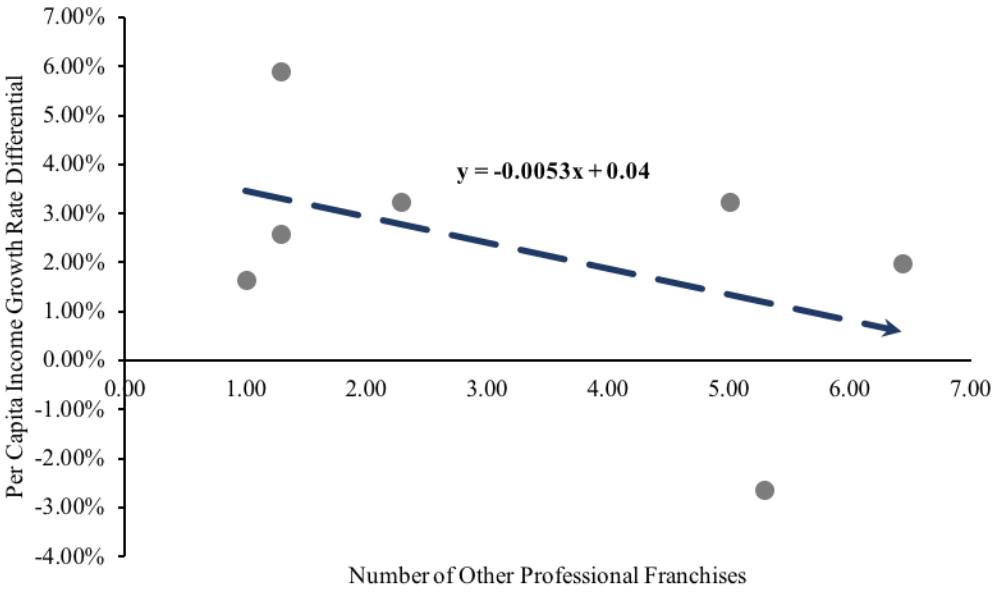

Figure 2: "MSAs Adding Franchises" Data Set - Number of Franchises vs. PCI Growth Rate – 1YR Differential

Similarly, Figure 3 illustrates the average number of franchises plotted against per capita income growth, utilizing a two-year average growth rate differential.

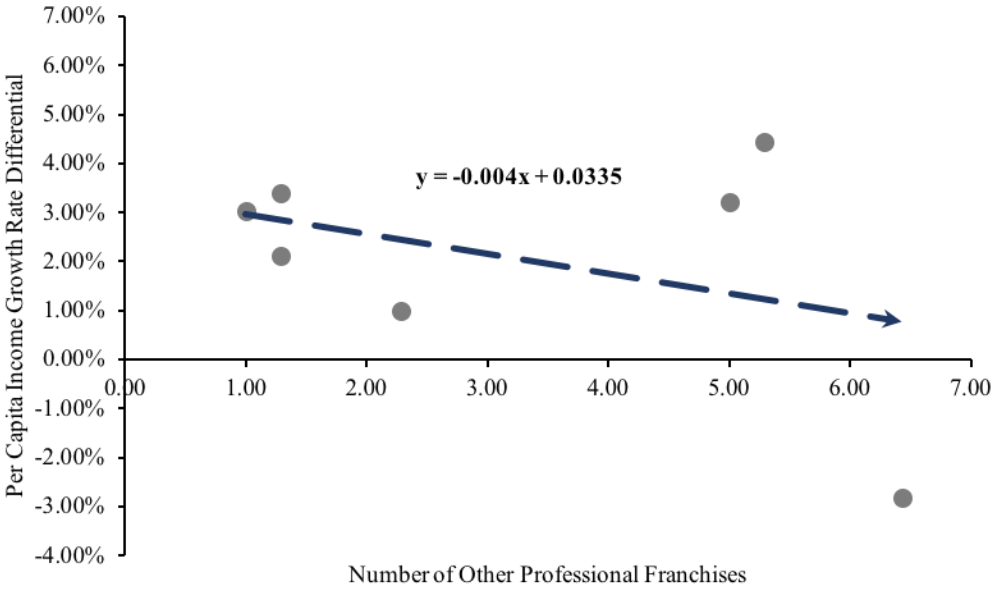

Figure 3: "MSAs Adding Franchises" Data Set - Number of Franchises vs. PCI Growth Rate - 2YR Differential

In both figures, the linear trendline displayed in the graph has a negative slope. This means that the number of other professional franchises has a negative relationship with per capita income growth rate differential. Interpreting this data concludes that as the number of other professional franchises in the MSA increases, per capita income growth increases at a decreasing rate. Additionally, comparing the independent variable coefficient of each linear equation allows for the estimation of the relative magnitude of the negative relationship between variables. Examining Figure 2, which uses a one-year growth rate differential, the x-variable coefficient is -0.0053, while in Figure 3, utilizing a two-year average differential, the coefficient is -0.004. This indicates that the negative relationship between the number of franchises and per capita income growth differential is stronger in the first year following relocation. When expanding the time horizon of analysis to a two-year average differential, the negative relationship persists, however in slightly less magnitude.

These results again serve to support a dilution effect, specifically when an MSA is adding an NFL franchise. A negative linear relationship clearly indicates that when a franchise is added to a market with a high number of sports franchises, there is an increasingly adverse impact on per capita income growth. The difference in magnitude seen between one-year and two-year average growth differentials can perhaps be explained by the public nature of financing often raised to attract new franchises to a city. This capital is raised with the notion that infrastructure construction and an influx of external revenues generated by the new franchise will outweigh the opportunity cost of reducing financing for other projects. If an unaccounted for dilution effect adversely impacts the team's media attention and revenue generation, it follows that this effect would be most strongly felt in its inaugural year, when policy makers were most heavily reliant on an influx of income to bridge the gap of public financing used to attract the team in the first place. Moving forward, the initial negative impact felt will diminish over time. However if a dilution effect hinders the franchise from meeting projected levels of economic stimulus and generating an appropriate return on initial investment, a persistent negative relationship will develop between the number of franchises in an MSA and per capita income growth, as illustrated in Figure 3.

Regression Model #3: "MSAs Losing Franchises" Data Set

Finally, the regression model was run on the data set containing data from all MSAs losing an NFL franchise during a relocation. Again, before running the model the VIF of each variable was calculated to gauge multicollinearity and verify the reliability of the model. Table 8 illustrates the VIF output for the given data set.

Variable	R_2	Variable Inflation Factor (VIF)
Population	84.05%	6.27
Number of Other Franchises	86.93%	7.65
Winning Percentage	43.26%	1.76
Before Trend	35.30%	1.54
After Trend	33.72%	1.51

Table 8: "MSAs Losing Franchises" Data Set - VIF Output

While multicollinearity and subsequent VIF outputs were slightly higher among variables for this data set, the VIF of each variable still fell below the requisite VIF = 10 threshold, confirming accurate variable effect estimation for the given variables and data set.

After running the regression model using the data set containing MSAs losing franchises during relocation, the following results table was generated, as shown in Table 9.

Term	Coefficient	95% Confidence Interval	T-value	P-value
Constant	37772	(32880, 42664)	15.57	<0.0001
Population	-0.0000206	(-0.0007976, 0.0007564)	-0.05	0.9577
Number of Other Franchises	-780	(-2902, 1343)	-0.74	0.4629
Win Percentage	20833	(7438, 34228)	3.14	0.0031
Before Trend	385.4	(-1029.8, 1800.5)	0.55	0.5857
After Trend	1339.8	(-63.3, 2742.9)	1.93	0.0608

Observations	49
R_2	34.26%
R_2 (adj.)	26.62%

Table 9: "MSAs Losing Franchises" Data Set - Results Table

As with the previous regression models, it first is key to note that both the before and after trend variables' p-values are insignificant, supporting a rejection of the null hypothesis for this data set. From there, however, the regression results of this data set diverge from previous results. In this instance, the p-values of population and the number of other franchises are insignificant, while the p-value of win percentage, 0.0031, falls below the alpha threshold and indicates statistical significance. This regression model is the only of the three models that indicates win percentage has a statistically significant effect on per capita income.

As such, similar to the "MSAs Adding Franchises" Data Set, the directionality and magnitude of the effect win percentage has on per capita income will be investigated by plotting it against one-year and two-year average changes in per capita income growth rate. Figure 4

illustrates average three-year win percentage before relocation, plotted against a one-year per capita income growth differential.

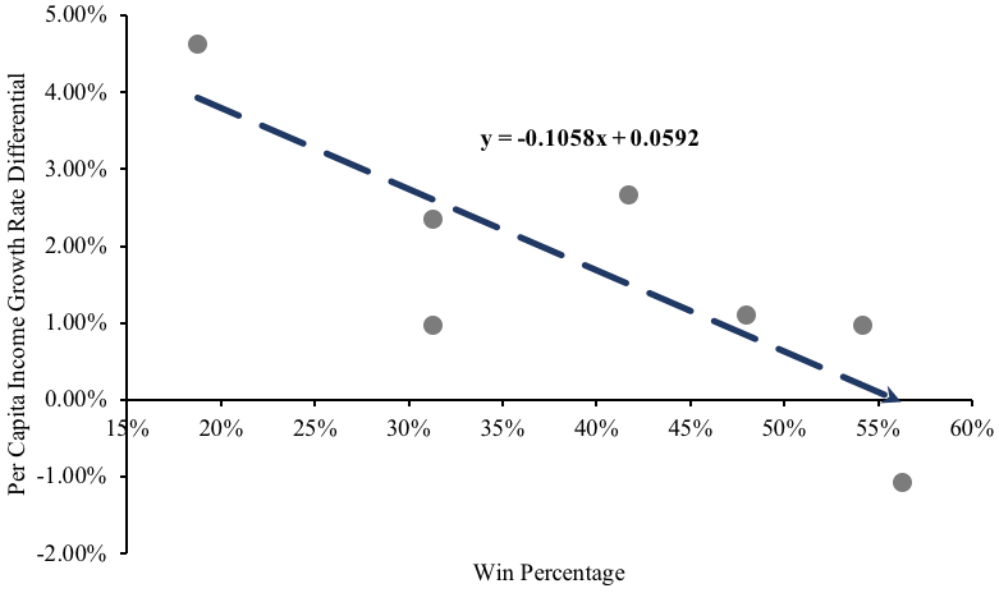

Figure 4: "MSAs Losing Franchises" Data Set – Win Percentage vs. PCI Growth Rate – 1YR Differential

Additionally, Figure 5 depicts average three-year win percentage before relocation plotted against a two-year average per capita income growth rate differential.

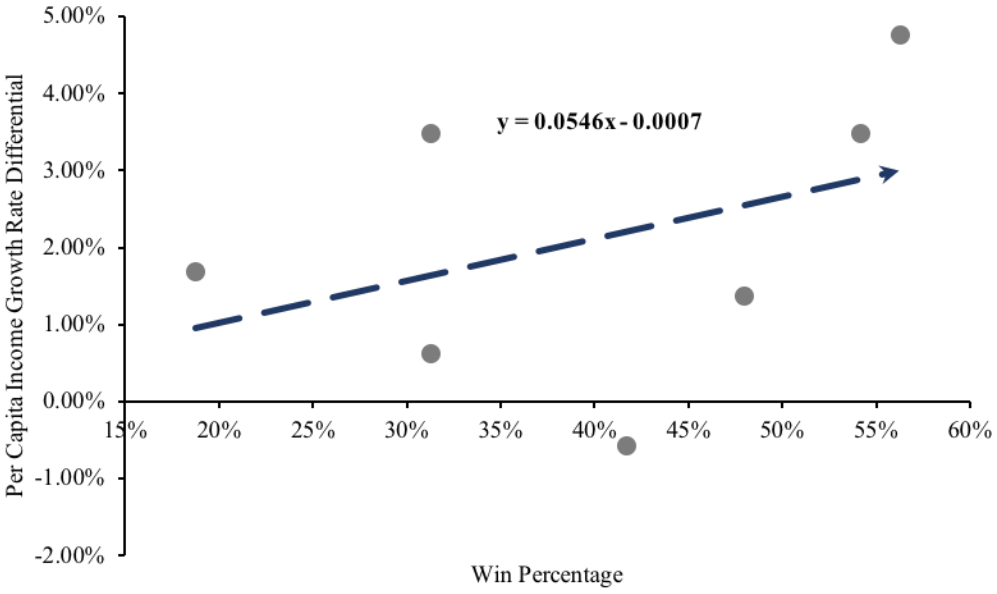

Figure 5: "MSAs Losing Franchises" Data Set – Win Percentage vs. PCI Growth Rate – 2YR Differential

These graphs illustrate key insights into the effect team success has on per capita income when a franchise is relocating out of a city. Immediately following relocation, when examining a one-year growth rate differential, there is a fairly strong negative relationship between win percentage and growth rate differential. These results indicate that, when a more successful team relocates away from a city, this has a greater negative impact on per capita income growth than that of a less successful team. This result offers support for the effect found by End and Davis in their study, where an increase in winning percentage of an NFL franchise increased real per capita income and per capita income growth in its host city. In the study, this effect was explained from a psychological perspective, with winning correlated to increased workplace productivity and consumer spending (End, 2008). It follows that, if a city was benefiting from an increase in per capita income growth stemming from a successful franchise, there would be a

steeper decline in growth rate following the departure of that franchise when compared to a city losing a less successful franchise.

However, when examining the relationship between win percentage and a two-year average growth rate differential, there is a slight positive relationship between win percentage and growth rate differential. This is interpreted as, over a two-year time horizon, cities experience greater increases in per capita income growth following the relocation of a more successful franchise than a less successful franchise. As this is a weaker relationship, this result can possibly be attributed to a general increase in growth rates across cases. However, one can speculate a more successful team likely has leverage to demand greater public outlays from policymakers in the form of tax exemptions, greater revenue shares and facility renovations. Again, these publicly financed expenses come at the opportunity cost of other growth-related projects. This may explain why, when a more successful team commanding higher levels of public spending leaves a city, that city may experience accelerated growth in per capita income, as a function of newly implemented projects generating higher returns.

Interestingly, while the number of other franchises did not register a statistically significant p-value for this data set, the directionality of its relationship to per capita income growth rate differential displays an inverse dilution effect trend. While not statistically supported by the regression model, this data analysis again suggests the presence of a dilution effect. Figure 6 illustrates the average number of franchises plotted against a one-year per capita income growth rate differential.

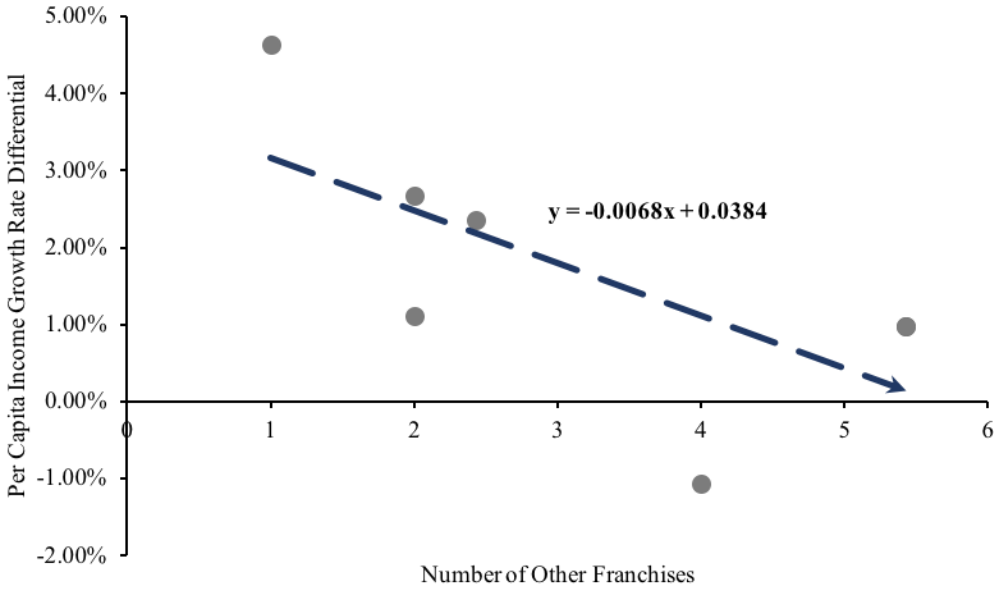

Figure 6: "MSAs Losing Franchises" Data Set – Number of Franchises vs. PCI Growth Rate – 1YR Differential

This graph indicates that, as the number of franchises increases, there is an adverse effect on per capita income growth following the relocation. This again is explained in the context of a dilution effect. In an MSA with a high number of sports franchises saturating the market, any effect due to a change in the sports environment will likely be diminished. Therefore, if a franchise leaving an MSA has a positive impact on per capita income growth rate due to reallocation of public funds, as previously discussed, then this effect would be more strongly felt in a smaller market, with fewer franchises. Whereas, in a large market oversaturated with sports franchises, the relocation of one franchise may not have as significant of an impact on the overall economy with the growth differential regressing toward zero.

Data Analysis Conclusions

The regression models run on all three data sets, coupled with linear relationship analysis on key variables, appear to provide support for several conclusions. First, in general, the results point towards a positive economic effect associated with losing a franchise and a negative economic effect associated with gaining a franchise. However, this effect plays out in two stages, as relocations affect the economy of their respective MSAs differently in the long term than they do immediately following relocation. This conclusion is supported by a comparison of average growth differentials of MSAs gaining and losing franchises, as illustrated in Table 10.

MSAs Adding Franchises			MSAs Losing Franchises		
MSA	**One Year Differential**	**Two Year Differential**	**MSA**	**One Year Differential**	**Two Year Differential**
Los Angeles (Raiders)	-2.64%	4.44%	Oakland	-1.07%	4.76%
Indianapolis	5.89%	3.40%	Baltimore	4.64%	1.69%
Phoenix	2.60%	2.13%	St. Louis (Cardinals)	2.36%	0.62%
St. Louis (Rams)	3.25%	1.00%	Los Angeles (Rams)	0.97%	3.49%
Oakland (Raiders)	3.25%	3.22%	Los Angeles (Raiders)	0.97%	3.49%
Baltimore	1.65%	3.02%	Cleveland	1.12%	1.37%
Los Angeles (Rams)	1.99%	-2.81%	St. Louis (Rams)	2.66%	-0.56%
Average	**2.28%**	**2.06%**	**Average**	**1.67%**	**2.12%**

Table 10: MSA Per Capita Income Differential

As the data illustrates, in the year immediately following relocation, MSAs which lost franchises on average experience a significantly lower growth rate than those gaining franchises. However, when examining a two-year differential, those MSAs which lost franchises actually fared better economically than those gaining franchises. These results suggest that, while there may be a psychological or economically material affect associated with losing a franchise which initially taxes growth, cities typically fare better economically in the years following a departure of a team than their counterparts.

Additionally, the results strongly supported the theory of a dilution effect diminishing the magnitude of economic impact a franchise relocation has on an MSA's economy. This was

substantiated by the fact that number of other franchises had a statistically significant impact on per capita income in both the “Complete MSA” Data Set and the “MSAs Adding Franchises” Data Set, which also displayed a negative linear relationship between per capita income growth differential and the number of franchises present in the MSA. Interestingly, the “MSAs Losing Franchises” Data Set also suggested the presence of a dilution effect during instances of a franchise leaving an MSA. In this case, MSAs with a higher number of franchises record lower levels of per capita income growth following a relocation than those experienced by MSAs with fewer franchises. It appears the dilution effect may diminish the economic effects of both franchise arrivals and departures, rather than just a franchise entering a new market.

Finally, the results offer support for the findings of End and Davis, who concluded that the win percentage of an NFL franchise has a positive relationship with per capita income and its growth rate in its host city (End, 2008). This theory is supported by examining the directionality of win percentage in the “MSAs Losing Franchises” Data Set, which demonstrated a relatively strong negative relationship between win percentage and per capita income growth immediately following relocation. It was concluded this result likely stemmed from the absence of the per capita income boost a winning franchise provides, as was proposed by End and Davis.

Chapter 5

Conclusion

Impact on Policymaker Decisions

The findings of this thesis ultimately raise the question: how should city policymakers take these results, among others, into their decision making process when considering changes to their sports environment? When taken in their entirety, these results corroborate that of other precedential studies, in that the requisite investment and outlay of public funding undertaken by city governments to attract and retain NFL franchises is not justified by the subsequent economic returns. If these franchises generated even a fraction of the economic benefit purported in commissioned impact studies, one would expect to see some kind of economic gain reflected. On the contrary, the results of this thesis indicate that, in the long term, there is actually a slight economic benefit to allowing a team to leave, with a subsequent adverse economic impact on cities introducing new franchises. As such, if policymakers are examining the decisions from a strictly economic perspective, this thesis does not recommend the use of public funding, tax exemptions and other incentives to attract or retain an NFL franchise.

However, in the case that policymakers are subject to external influence and must weigh a relocation decision, it is important to take into account key dynamics in order to most accurately estimate the total impact on the MSA's economy. For MSAs losing a franchise, losing a more successful franchise may have a greater negative impact, as a higher win percentage has shown a positive relationship with per capita income growth rate. As such, policymaker may be more incentivized to retain franchises with a history of team success.

Additionally, results show that all economic impacts of a franchise relocation are diminished in a market with a high number of other professional franchises. For MSAs losing a franchise, the long-term benefit of that franchise's exit is diminished in saturated markets, as the public funding reallocated from that franchise represents a smaller percentage of funds devoted to commercial sports as a whole. For MSAs gaining a franchise, results show a short-term economic boost with the arrival of a franchise, likely motivated by the intrigue of a new team. However, teams entering an oversaturated market may experience cannibalization of media attention and revenues by competing franchises, as the number of other franchises shows a negative relationship with per capita income growth. Ultimately, the results show that all MSAs adding franchises, on average, fare worse economically than those losing franchises.

Topics to Further Explore and Alternative Considerations

After interpreting the results of the regression model and data analysis, several points were identified which could serve to improve the construction of the model and lend further clarity to the results.

First, further analysis should be conducted to determine the cause and effect relationship of the decline in per capita income growth immediately following franchise relocation. These results bring into question a "chicken or egg" paradox. Is the relocation of the franchise causing the decline in growth, or was the decline an ongoing trend which forced the team to relocate, as the city was no longer able to financially support an NFL franchise? Widening the scope of analysis could potentially lend clarity to this question, allowing for a more complete observation of economic trends preceding the relocation.

In conjunction, is there a better way to account for city-specific economic trends than a simple before and after trend variable?

With the high level of correlation between per capita income and national per capita income in the complete data set, it would be interesting to account for economic trends specifically influencing each individual city. Adding variables to account for industry or geography specific economic trends which a city could be subject to would add interesting insight to the analysis, while potentially providing a more comprehensive estimate of all the factors influencing a city's economy.

Furthermore, with the results strongly supporting a dilution effect in cities with a large number of franchises, further exploration could be conducted to determine the magnitude and sensitivity of this effect. Incorporating a variable to account for incremental increases in the number of franchises could provide insight into whether there is a threshold for this effect to take place, and if the effect reaches a plateau as that number increases. Additionally, expanding the time horizon of analysis could examine whether this dilution effect persists for the life of the franchise, or if it diminishes over time following relocation.

Finally, when analyzing a complex topic such as metropolitan economic influences, there are always alternative considerations that could have been made to produce different results. First, the decision to limit the scope of analysis to strictly NFL relocations significantly narrowed the number of viable relocation cases and likely had a substantial impact on the end results. Other specific parameters, such as the use of MSAs and using a seven-year lead-lag time horizon limited the scope of analysis and potentially influenced the ultimate outcome. Finally, the variables chosen for the regression model serve an integral part in the overall analysis, and a

selection of alternative variables could certainly alter the results of both the regression model and the data analysis as a whole.

As voiced by Robert Baade, there is no model yet conceived which takes into account all necessary data to allow an unbiased, consistent estimate of a team's impact on a city's economy (Baade, 1996). Ultimately, an allowance for diversity in data and variable selection serves to advance the research and spur noteworthy findings on the topic. However, as with many contentious topics, while the complexity of the question is what lends intrigue to the analysis, it is also what also makes arriving at a consensus answer incredibly difficult.

Appendix A

Relocation Case Data

The following data is organized by MSA pairs for each respective relocation case and is ordered chronologically based on the year of relocation. The three-year average win percentage was calculated using the three years prior to relocation and was then applied for all years in the respective case. All dollar figures are in thousands of U.S. Dollars.

Case #1: Oakland Raiders to Los Angeles

MSA	Year	Per Capita Income	Per Capita Income (2020 USD)	Population	Number of Other Franchises	3yr Average Win Percentage
Oakland						
	1979	$12,470.00	$44,493.75	3,184,000	4	.563
	1980	$13,964.00	$43,558.73	3,253000	4	.563
	1981	$15,601.00	$44,421.70	3,295,801	4	.563
	1982	$16,542.00	$43,945.49	3,333,983	4	.563
	1983	$17,695.00	$45,877.36	3,386,083	4	.563
	1984	$19,364.00	$48,171.17	3,428,076	4	.563
	1985	$20,439.00	$49,002.50	3,479,469	4	.563
Los Angeles						
	1979	$10,991.00	$39,216.59	9,292,971	5	.563
	1980	$12,195.00	$38,040.58	9,450,553	5	.563
	1981	$13,522.00	$38,502.03	9,613,596	5	.563
	1982	$14,095.00	$37,485.58	9,813,345	5	.563
	1983	$14,833.00	$38,457.12	10,009,837	5	.563
	1984	$16,156.00	$40,190.74	10,165,046	6	.563
	1985	$17,118.00	$41,040.4	10,354,834	6	.563

Case #2: Baltimore Colts to Indianapolis

MSA	Year	Per Capita Income	Per Capita Income (2020 USD)	Population	Number of Other Franchises	3yr Average Win Percentage
Baltimore						
	1981	$12,312.00	$35,056.72	2,234,413	1	.188
	1982	$13,212.00	$35,137.25	2,220,748	1	.188
	1983	$14,059.00	$36,450.39	2,228,439	1	.188
	1984	$15,332.00	$38,140.90	2,244,735	1	.188
	1985	$16,432.00	$39,395.72	2,255,970	1	.188
	1986	$17,402.00	$40,997.36	2,285,633	1	.188

	1987	$18,393.00	$41,804.94	2,309,719	1	.188
Indianapolis						
	1981	$	$32,024.28	1,350,644	1	.188
	1982	$	$30,937.90	1,351,396	1	.188
	1983	$	$32,099.89	1,352,538	1	.188
	1984	$	$33,991.47	1,360,966	1	.188
	1985	$	$35,032.27	1,367,229	1	.188
	1986	$	$36,466.97	1,375,291	1	.188
	1987	$	$37,206.92	1,388481	1	.188

Case #3: St. Louis Cardinals to Phoenix

MSA	Year	Per Capita Income	Per Capita Income (2020 USD)	Population	Number of Other Franchises	3yr Average Win Percentage
St. Louis						
	1991	$20,956.00	$39,750.30	2,579,363	2	0.313
	1992	$22,075.00	$40,618.47	2,590,410	2	0.313
	1993	$22,848.00	$40,818.02	2,605,968	2	0.313
	1994	$23,970.00	$41,780.84	2,616,756	2	0.313
	1995	$25,285.00	$42,772.44	2,629,433	3	0.313
	1996	$26,383.00	$43,433.62	2,640,161	3	0.313
	1997	$27,880.00	$44,867.32	2,651,165	3	0.313
Phoenix						
	1991	$19,159.00	$36,341.66	2,319,206	1	0.313
	1992	$19,744.00	$36,329.38	2,398,760	1	0.313
	1993	$20,356.00	$36,366.05	2,491,818	1	0.313
	1994	$21,405.00	$37,309.93	2,613,502	1	0.313
	1995	$22,483.00	$38,032.54	2,744,046	1	0.313
	1996	$23,653.00	$38,939.30	2,855,711	2	0.313
	1997	$24,932.00	$40,123.10	2,963,714	2	0.313

Case #4: Los Angeles Rams to St. Louis

MSA	Year	Per Capita Income	Per Capita Income (2020 USD)	Population	Number of Other Franchises	3yr Average Win Percentage
Los Angeles						
	1992	$23,181.00	$42,653.54	11,552,438	6	.313
	1993	$23,259.00	$41,552.27	11,632,798	6	.313
	1994	$23,790.00	$41,467.10	11,663,207	6	.313
	1995	$24,752.00	$41,870.81	11,692,693	5	.313
	1996	$26,001.00	$42,804.75	11,771,038	5	.313
	1997	$27,121.00	$43,645.86	11,915,815	5	.313
	1998	$29,060.00	$45,991.64	12,086,776	5	.313
St. Louis						
	1992	$22,075.00	$40,618.47	2,590,410	3	.313
	1993	$22,848.00	$40,818.02	2,605,968	3	.313
	1994	$23,970.00	$41,780.84	2,616,756	2	.313
	1995	$25,285.00	$42,772.44	2,629,433	2	.313
	1996	$26,383.00	$43,433.62	2,640,161	2	.313
	1997	$27,880.00	$44,867.32	2,651,165	2	.313
	1998	$29,238.00	$46,273.35	2,657,031	2	.313

Case #5: Los Angeles Raiders to Oakland

MSA	Year	Per Capita Income	Per Capita Income (2020 USD)	Population	Number of Other Franchises	3yr Average Win Percentage
Los Angeles						
	1992	$23,181.00	$42,653.54	11,552,438	6	0.542
	1993	$23,259.00	$41,552.27	11,632,798	6	0.542
	1994	$23,790.00	$41,467.10	11,663,207	6	0.542
	1995	$24,752.00	$41,870.81	11,692,693	5	0.542
	1996	$26,001.00	$42,804.75	11,771,038	5	0.542
	1997	$27,121.00	$43,645.86	11,915,815	5	0.542

	1998	$29,060.00	$45,991.64	12,086,776	5	0.542
Oakland						
	1992	$28,809.00	$53,009.18	3,805,588	5	0.542
	1993	$29,663.00	$52,993.03	3,839,619	5	0.542
	1994	$30,606.00	$53,347.71	3,859,905	5	0.542
	1995	$32,561.00	$55,080.61	3,883,894	5	0.542
	1996	$34,895.00	$57,446.70	3,923,208	5	0.542
	1997	$36,693.00	$59,050.09	3,985,694	5	0.542
	1998	$40,051.00	$63,386.48	4,045,185	5	0.542

Case #6: Cleveland Browns to Baltimore (Ravens)

MSA	Year	Per Capita Income	Per Capita Income (2020 USD)	Population	Number of Other Franchises	3yr Average Win Percentage
Cleveland						
	1993	$23,356.00	$41,725.56	2,140,398	2	0.480
	1994	$24,460.00	$42,634.94	2,146,303	2	0.480
	1995	$25,613.00	$43,327.29	2,150,203	2	0.480
	1996	$26,613.00	$43,812.27	2,153,598	2	0.480
	1997	$28,000.00	$45,060.44	2,152,676	2	0.480
	1998	$29,526.00	$46,729.15	2,151,568	2	0.480
	1999	$30,386.00	$47,164.30	2,149,943	2	0.480
Baltimore						
	1993	$24,076.00	$43,011.84	2,458,038	1	0.480
	1994	$24,954.00	$43,496.00	2,474,364	1	0.480
	1995	$25,981.00	$43,949.80	2,490,370	1	0.480
	1996	$27,137.00	$44,674.91	2,501,453	1	0.480
	1997	$28,616.00	$46,051.77	2,513,492	1	0.480
	1998	$30,588.00	$48,409.92	2,525,266	1	0.480
	1999	$32,387.00	$50,270.20	2,540,307	1	0.480

Case #7: St. Louis Rams to Los Angeles

MSA	Year	Per Capita Income	Per Capita Income (2020 USD)	Population	Number of Other Franchises	3yr Average Win Percentage
St. Louis						
	2013	$46,314.00	$51,166.87	2,799,459	2	0.417
	2014	$48,071.00	$52,029.74	2,803,516	2	0.417
	2015	$49,668.00	$53,691.80	2,807,498	2	0.417
	2016	$51,500.00	$55,122.47	2,805,437	2	0.417
	2017	$52,944.00	$55,757.25	2,805,850	2	0.417
	2018	$55,883.00	$57,209.61	2,805,465	2	0.417
	2019	$58,024.37	$58,438.10	2,806,669	2	0.417
Los Angeles						
	2013	$50,457.00	$55,743.98	13,106,114	6	0.417
	2014	$53,404.00	$57,801.92	13,178,730	6	0.417
	2015	$56,839.00	$61,443.75	13,250,999	6	0.417
	2016	$58,548.00	$62,666.22	13,291,247	6	0.417
	2017	$60,649.00	$63,871.66	13,298,709	7	0.417
	2018	$63,913.00	$65,430.24	13,291,486	7	0.417
	2019	$67,012.75	$67,491.25	13,328,915	7	0.417

Appendix B

Regression Model Input Data

The following data provides the data inputs for each of the three regression models. The "Complete MSA" MSA Data Set contains all data from MSAs both gaining and losing franchises. The "MSAs Gaining Franchises" and "MSAs Losing Franchises" Data sets contain only data from MSAs which gained or lost a franchise, respectively, during relocation. The three-year average win percentage was calculated using the three years prior to relocation and was then applied for all years in the respective case. All dollar figures are in thousands of U.S. Dollars.

"Complete MSA" Data Set:

MSA	Year	Per Capita Income	Population	Number of Other Franchises	Win Percentage	Before Trend	After Trend
Oakland	1979	44493.75	3184000	4	0.563	-3	0
	1980	43558.73	3253000	4	0.563	-2	0
	1981	44421.7	3295801	4	0.563	-1	0
	1982	43945.49	3333983	4	0.563	0	0
	1983	45877.36	3386083	4	0.563	0	1
	1984	48171.17	3428076	4	0.563	0	2
	1985	49002.5	3479469	4	0.563	0	3
Los Angeles	1979	39216.59	9292971	5	0.563	-3	0
	1980	38040.58	9450553	5	0.563	-2	0
	1981	38502.03	9613596	5	0.563	-1	0
	1982	37485.58	9813345	5	0.563	0	0
	1983	38457.12	10009837	5	0.563	0	1
	1984	40190.74	10165046	6	0.563	0	2
	1985	41040.4	10354834	6	0.563	0	3
Baltimore	1981	35056.72	2214413	1	0.188	-3	0
	1982	35137.25	2220748	1	0.188	-2	0
	1983	36450.39	2228439	1	0.188	-1	0
	1984	38140.9	2244735	1	0.188	0	0
	1985	39395.72	2255970	1	0.188	0	1
	1986	40997.36	2285633	1	0.188	0	2
	1987	41804.94	2309719	1	0.188	0	3
Indianapolis	1981	32024.28	1350644	1	0.188	-3	0
	1982	30937.9	1351396	1	0.188	-2	0
	1983	32099.89	1352538	1	0.188	-1	0
	1984	33991.47	1360966	1	0.188	0	0
	1985	35032.27	1367229	1	0.188	0	1

	1986	36466.97	1375291	1	0.188	0	2
	1987	37206.92	1388481	1	0.188	0	3
St. Louis	1991	39750.3	2579363	2	0.313	-3	0
	1992	40618.47	2590410	2	0.313	-2	0
	1993	40818.02	2605968	2	0.313	-1	0
	1994	41780.84	2616756	2	0.313	0	0
	1995	42772.44	2629433	3	0.313	0	1
	1996	43433.62	2640161	3	0.313	0	2
	1997	44867.32	2651165	3	0.313	0	3
Phoenix	1991	36341.66	2319206	1	0.313	-3	0
	1992	36329.38	2398760	1	0.313	-2	0
	1993	36366.05	2491818	1	0.313	-1	0
	1994	37309.93	2613502	1	0.313	0	0
	1995	38032.54	2744046	1	0.313	0	1
	1996	38939.3	2855711	2	0.313	0	2
	1997	40123.1	2963714	2	0.313	0	3
Los Angeles	1992	42653.54	11552438	6	0.313	-3	0
	1993	41552.27	11632798	6	0.313	-2	0
	1994	41467.1	11663207	6	0.313	-1	0
	1995	41870.81	11692693	5	0.313	0	0
	1996	42804.75	11771038	5	0.313	0	1
	1997	43645.86	11915815	5	0.313	0	2
	1998	45991.64	12086776	5	0.313	0	3
St. Louis	1992	40618.47	2590410	3	0.313	-3	0
	1993	40818.02	2605968	3	0.313	-2	0
	1994	41780.84	2616756	2	0.313	-1	0
	1995	42772.44	2629433	2	0.313	0	0
	1996	43433.62	2640161	2	0.313	0	1
	1997	44867.32	2651165	2	0.313	0	2
	1998	46273.35	2657031	2	0.313	0	3

Los Angeles	1992	42653.54	11552438	6	0.542	-3	0
	1993	41552.27	11632798	6	0.542	-2	0
	1994	41467.1	11663207	6	0.542	-1	0
	1995	41870.81	11692693	5	0.542	0	0
	1996	42804.75	11771038	5	0.542	0	1
	1997	43645.86	11915815	5	0.542	0	2
	1998	45991.64	12086776	5	0.542	0	3
Oakland	1992	53009.18	3805588	5	0.542	-3	0
	1993	52993.03	3839619	5	0.542	-2	0
	1994	53347.71	3859905	5	0.542	-1	0
	1995	55080.61	3883894	5	0.542	0	0
	1996	57446.7	3923208	5	0.542	0	1
	1997	59050.09	3985694	5	0.542	0	2
	1998	63386.48	4045185	5	0.542	0	3
Cleveland	1993	41725.56	2140398	2	0.480	-3	0
	1994	42634.94	2146303	2	0.480	-2	0
	1995	43327.29	2150203	2	0.480	-1	0
	1996	43812.27	2153598	2	0.480	0	0
	1997	45060.44	2152676	2	0.480	0	1
	1998	46729.15	2151568	2	0.480	0	2
	1999	47164.3	2149943	2	0.480	0	3
Baltimore	1993	43011.84	2458038	1	0.480	-3	0
	1994	43496	2475364	1	0.480	-2	0
	1995	43949.8	2490370	1	0.480	-1	0
	1996	44674.91	2501453	1	0.480	0	0
	1997	46051.77	2513492	1	0.480	0	1
	1998	48409.92	2525266	1	0.480	0	2
	1999	50270.2	2540307	1	0.480	0	3
St. Louis	2013	51166.87	2799459	2	0.417	-3	0
	2014	52029.74	2803516	2	0.417	-2	0

	2015	53691.8	2807498	2	0.417	-1	0
	2016	55122.47	2805437	2	0.417	0	0
	2017	55757.25	2805850	2	0.417	0	1
	2018	57209.61	2805465	2	0.417	0	2
	2019	58438.10	2806668.8	2	0.417	0	3
Los Angeles	2013	55743.98	13106114	6	0.417	-3	0
	2014	57801.92	13178730	6	0.417	-2	0
	2015	61443.75	13250999	6	0.417	-1	0
	2016	62666.22	13291247	6	0.417	0	0
	2017	63871.66	13298709	7	0.417	0	1
	2018	65430.24	13291486	7	0.417	0	2
	2019	67491.25	13328915	7	0.417	0	3

“MSAs Adding Franchises” Data Set:

MSA	Year	Per Capita Income	Population	Number of Other Franchises	Win Percentage	Before Trend	After Trend
Los Angeles	1979	39216.59	9292971	5	0.563	-3	0
	1980	38040.58	9450553	5	0.563	-2	0
	1981	38502.03	9613596	5	0.563	-1	0
	1982	37485.58	9813345	5	0.563	0	0
	1983	38457.12	10009837	5	0.563	0	1
	1984	40190.74	10165046	6	0.563	0	2
	1985	41040.40	10354834	6	0.563	0	3
Indianapolis	1981	32024.28	1350644	1	0.188	-3	0
	1982	30937.90	1351396	1	0.188	-2	0
	1983	32099.89	1352538	1	0.188	-1	0
	1984	33991.47	1360966	1	0.188	0	0
	1985	35032.27	1367229	1	0.188	0	1

	1986	36466.97	1375291	1	0.188	0	2
	1987	37206.92	1388481	1	0.188	0	3
Phoenix	1991	36341.66	2319206	1	0.313	-3	0
	1992	36329.38	2398760	1	0.313	-2	0
	1993	36366.05	2491818	1	0.313	-1	0
	1994	37309.93	2613502	1	0.313	0	0
	1995	38032.54	2744046	1	0.313	0	1
	1996	38939.30	2855711	2	0.313	0	2
	1997	40123.10	2963714	2	0.313	0	3
St. Louis	1992	40618.47	2590410	3	0.313	-3	0
	1993	40818.02	2605968	3	0.313	-2	0
	1994	41780.84	2616756	2	0.313	-1	0
	1995	42772.44	2629433	2	0.313	0	0
	1996	43433.62	2640161	2	0.313	0	1
	1997	44867.32	2651165	2	0.313	0	2
	1998	46273.35	2657031	2	0.313	0	3
Oakland	1992	53009.18	3805588	5	0.542	-3	0
	1993	52993.03	3839619	5	0.542	-2	0
	1994	53347.71	3859905	5	0.542	-1	0
	1995	55080.61	3883894	5	0.542	0	0
	1996	57446.70	3923208	5	0.542	0	1
	1997	59050.09	3985694	5	0.542	0	2
	1998	63386.48	4045185	5	0.542	0	3
Baltimore	1993	43011.84	2458038	1	0.480	-3	0
	1994	43496.00	2475364	1	0.480	-2	0
	1995	43949.80	2490370	1	0.480	-1	0
	1996	44674.91	2501453	1	0.480	0	0
	1997	46051.77	2513492	1	0.480	0	1
	1998	48409.92	2525266	1	0.480	0	2
	1999	50270.20	2540307	1	0.480	0	3

Los Angeles	2013	55743.98	13106114	6	0.417	-3	0
	2014	57801.92	13178730	6	0.417	-2	0
	2015	61443.75	13250999	6	0.417	-1	0
	2016	62666.22	13291247	6	0.417	0	0
	2017	63871.66	13298709	7	0.417	0	1
	2018	65430.24	13291486	7	0.417	0	2
	2019	67491.25	13328915	7	0.417	0	3

"MSAs Losing Franchises" Data Set:

MSA	Year	Per Capita Income	Population	Number of Other Franchises	Win Percentage	Before Trend	After Trend
Oakland	1979	44493.75	3184000	4	0.563	-3	0
	1980	43558.73	3253000	4	0.563	-2	0
	1981	44421.7	3295801	4	0.563	-1	0
	1982	43945.49	3333983	4	0.563	0	0
	1983	45877.36	3386083	4	0.563	0	1
	1984	48171.17	3428076	4	0.563	0	2
	1985	49002.5	3479469	4	0.563	0	3
Baltimore	1981	35056.72	2214413	1	0.188	-3	0
	1982	35137.25	2220748	1	0.188	-2	0
	1983	36450.39	2228439	1	0.188	-1	0
	1984	38140.9	2244735	1	0.188	0	0
	1985	39395.72	2255970	1	0.188	0	1
	1986	40997.36	2285633	1	0.188	0	2
	1987	41804.94	2309719	1	0.188	0	3
St. Louis	1991	39750.3	2579363	2	0.313	-3	0
	1992	40618.47	2590410	2	0.313	-2	0
	1993	40818.02	2605968	2	0.313	-1	0

	1994	41780.84	2616756	2	0.313	0	0
	1995	42772.44	2629433	3	0.313	0	1
	1996	43433.62	2640161	3	0.313	0	2
	1997	44867.32	2651165	3	0.313	0	3
Los Angeles	1992	42653.54	11552438	6	0.313	-3	0
	1993	41552.27	11632798	6	0.313	-2	0
	1994	41467.1	11663207	6	0.313	-1	0
	1995	41870.81	11692693	5	0.313	0	0
	1996	42804.75	11771038	5	0.313	0	1
	1997	43645.86	11915815	5	0.313	0	2
	1998	45991.64	12086776	5	0.313	0	3
Los Angeles	1992	42653.54	11552438	6	0.542	-3	0
	1993	41552.27	11632798	6	0.542	-2	0
	1994	41467.1	11663207	6	0.542	-1	0
	1995	41870.81	11692693	5	0.542	0	0
	1996	42804.75	11771038	5	0.542	0	1
	1997	43645.86	11915815	5	0.542	0	2
	1998	45991.64	12086776	5	0.542	0	3
Cleveland	1993	41725.56	2140398	2	0.480	-3	0
	1994	42634.94	2146303	2	0.480	-2	0
	1995	43327.29	2150203	2	0.480	-1	0
	1996	43812.27	2153598	2	0.480	0	0
	1997	45060.44	2152676	2	0.480	0	1
	1998	46729.15	2151568	2	0.480	0	2
	1999	47164.3	2149943	2	0.480	0	3
St. Louis	2013	51166.87	2799459	2	0.417	-3	0
	2014	52029.74	2803516	2	0.417	-2	0
	2015	53691.8	2807498	2	0.417	-1	0
	2016	55122.47	2805437	2	0.417	0	0
	2017	55757.25	2805850	2	0.417	0	1

2018	57209.61	2805465	2	0.417	0	2
2019	58438.1	2806668.8	2	0.417	0	3

Appendix C

National Per Capita Income Data

The following data illustrates MSA per capita income compared to national per capita income for the given year. All MSA per capita income figures are in thousands of U.S. Dollars, while all national per capita income figures are in millions of U.S. Dollars. The data set is ordered chronologically.

MSA Per Capita Income vs. National Per Capita Income:

Year	MSA Per Capita Income	National Per Capita Income
1979	$44,493.75	$32,940.36
1979	$43,558.73	$31,755.08
1980	$44,421.70	$32,175.19
1980	$43,945.49	$31,911.28
1981	$45,877.36	$32,921.77
1981	$48,171.17	$34,593.49
1981	$49,002.50	$35,375.11
1981	$35,056.72	$32,175.19
1982	$35,137.25	$31,911.28
1982	$36,450.39	$32,921.77
1982	$38,140.90	$34,593.49
1982	$39,395.72	$35,375.11
1983	$40,997.36	$36,492.88
1983	$41,804.94	$37,022.82
1983	$39,750.30	$37,993.82
1983	$40,618.47	$38,806.05
1984	$40,818.02	$38,826.06
1984	$41,780.84	$39,349.29
1984	$42,772.44	$39,933.91
1984	$43,433.62	$40,779.83
1985	$44,867.32	$41,830.57
1985	$42,653.54	$38,806.05
1985	$41,552.27	$38,826.06
1985	$41,467.10	$39,349.29
1986	$41,870.81	$39,933.91
1986	$42,804.75	$40,779.83
1987	$43,645.86	$41,830.57

1987	$45,991.64	$43,612.93
1991	$42,653.54	$38,806.05
1991	$41,552.27	$38,826.06
1992	$41,467.10	$39,349.29
1992	$41,870.81	$39,933.91
1992	$42,804.75	$40,779.83
1992	$43,645.86	$41,830.57
1992	$45,991.64	$43,612.93
1992	$41,725.56	$38,826.06
1993	$42,634.94	$39,349.29
1993	$43,327.29	$39,933.91
1993	$43,812.27	$40,779.83
1993	$45,060.44	$41,830.57
1993	$46,729.15	$43,612.93
1993	$47,164.30	$44,508.53
1993	$51,166.87	$49,550.57
1993	$52,029.74	$50,933.32
1994	$53,691.80	$52,945.90
1994	$55,122.47	$53,377.81
1994	$55,757.25	$54,641.98
1994	$57,209.61	$55,738.50
1994	$58,438.10	$57,005.95
1994	$39,216.59	$32,940.36
1994	$38,040.58	$31,755.08
1994	$38,502.03	$32,175.19
1995	$37,485.58	$31,911.28
1995	$38,457.12	$32,921.77
1995	$40,190.74	$34,593.49
1995	$41,040.40	$35,375.11
1995	$32,024.28	$32,175.19

1995	$30,937.90	$31,911.28
1995	$32,099.89	$32,921.77
1995	$33,991.47	$34,593.49
1996	$35,032.27	$35,375.11
1996	$36,466.97	$36,492.88
1996	$37,206.92	$37,022.82
1996	$36,341.66	$37,993.82
1996	$36,329.38	$38,806.05
1996	$36,366.05	$38,826.06
1996	$37,309.93	$39,349.29
1996	$38,032.54	$39,933.91
1997	$38,939.30	$40,779.83
1997	$40,123.10	$41,830.57
1997	$40,618.47	$38,806.05
1997	$40,818.02	$38,826.06
1997	$41,780.84	$39,349.29
1997	$42,772.44	$39,933.91
1997	$43,433.62	$40,779.83
1997	$44,867.32	$41,830.57
1998	$46,273.35	$43,612.93
1998	$53,009.18	$38,806.05
1998	$52,993.03	$38,826.06
1998	$53,347.71	$39,349.29
1998	$55,080.61	$39,933.91
1998	$57,446.70	$40,779.83
1999	$59,050.09	$41,830.57
1999	$63,386.48	$43,612.93
2013	$43,011.84	$38,826.06
2013	$43,496.00	$39,349.29
2014	$43,949.80	$39,933.91

2014	$44,674.91	$40,779.83
2015	$46,051.77	$41,830.57
2015	$48,409.92	$43,612.93
2016	$50,270.20	$44,508.53
2016	$55,743.98	$49,550.57
2017	$57,801.92	$50,933.32
2017	$61,443.75	$52,945.90
2018	$62,666.22	$53,377.81
2018	$63,871.66	$54,641.98
2019	$65,430.24	$55,738.50
2019	$67,491.25	$57,005.95

BIBLIOGRAPHY

Baade, Robert A., and Richard F. Dye. “The Impact of Stadiums and Professional Sports on Metropolitan Area Development.” *Growth & Change*, vol. 21, no. 2, Spring 1990, p. 1. *EBSCOhost*, doi:10.1111/j.1468-2257.1990.tb00513.x.

Baade, Robert A. “Professional Sports as Catalysts for Metropolitan Economic Development.” *Journal of Urban Affairs*, 1996, www.tandfonline.com/doi/citedby/10.1111/j.14679906.1996.tb00361.x?scroll=top&needAccess=true.

Badenhausen, Kurt. “The World's 50 Most Valuable Sports Teams 2019.” *Forbes*, Forbes Magazine, 23 July 2019, www.forbes.com/sites/kurtbadenhausen/2019/07/22/the-worlds-50-most-valuable-sports-teams-2019/#1c9a0ea8283d.

Belson, Ken. “Team Relocations Keep N.F.L. Moving Up Financially.” *The New York Times*, The New York Times, 12 Jan. 2017, www.nytimes.com/2017/01/12/sports/football/chargers-los-angeles-san-diego-nfl.html.

Bowling, Robert Taylor. "Sports Aggravated: The Fan's Guide to the Franchise Relocation Problem in Professional Sports." Stetson Law Review, vol. 28, no. 3, Winter 1999, p. 645-682. HeinOnline.

Coates, Dennis, and Brad R. Humphreys. “The Growth Effects of Sport Franchises, Stadia, and Arenas.” *Wiley Online Library*, John Wiley & Sons, Ltd, 15 Sept. 1999, onlinelibrary.wiley.com/doi/abs/10.1002/%28SICI%291520-6688%28199923%2918%3A4%3C601%3A%3AAID-PAM4%3E3.0.CO%3B2-A.

Coates, Dennis, and Brad R. Humphreys. "The Economic Impact of Postseason Play in Professional Sports." *Journal of Sports Economics*, vol. 3, no. 3, Aug. 2002, pp. 291–299, doi:10.1177/1527002502003003005.

Eckstein, Jakob. "How The NFL Makes Money: TV Is King, Streaming and Gambling on Horizon." *Investopedia*, Investopedia, 5 Feb. 2020, www.investopedia.com/articles/personal-finance/062515/how-nfl-makes-money.asp.

End, Christian M., and Michael C. Davis. "A Winning Proposition: The Economic Effect of Successful National Football League Franchises." *Wiley Online Library*, John Wiley & Sons, Ltd, 8 Apr. 2008, onlinelibrary.wiley.com/doi/abs/10.1111/j.1465-7295.2008.00124.x.

ESPN. "NFL Football Attendance." *ESPN*, ESPN Internet Ventures, 2019, www.espn.com/nfl/attendance/_/year/2019.

Fuller, Steve. "Topic: National Football League (NFL)." *Statista*, Statista, 18 Oct. 2018, www.statista.com/topics/963/national-football-league/.

Gough, Christina. "NFL Revenue by Year." *Statista*, Statista, 14 Jan. 2020, www.statista.com/statistics/193457/total-league-revenue-of-the-nfl-since-2005/.

Hair, Joseph F., et al. "Multivariate Data Analysis." *Pearson New International Edition*, Pearson Education - Seventh Edition, 2014, is.muni.cz/el/1423/podzim2017/PSY028/um/_Hair_-_Multivariate_data_analysis_7th_revised.pdf.

Kerr, Jeff. "Las Vegas Raiders Latest NFL Franchise to Change Cities: Here's a Look at All 11 Who've Done It." *CBSSports.com*, CBS Sports, 4 Feb. 2020, www.cbssports.com/nfl/news/las-vegas-raiders-latest-nfl-franchise-to-change-cities-heres-a-look-at-all-11-whove-done-it/.

Kim, Jae H. “How to Choose the Level of Significance: A Pedagogical Note.” *SSRN Electronic Journal*, 2015, doi:10.2139/ssrn.2652773.

LAEDC. “THE NFL LOS ANGELES STADIUM IN CARSON: AN ECONOMIC IMPACT ANALYSIS.” *Los Angeles County Economic Development Corporation*, Institute for Applied Economics, Mar. 2015, laedc.org/wp-content/uploads/2015/04/Los-Angeles-Stadium-in-Carson_LAEDC_FINAL.pdf.

Lertwachara, Kaveephong, and James J. Cochran. “An Event Study of the Economic Impact of Professional Sport Franchises on Local U.S. Economies.” Journal of Sports Economics, vol. 8, no. 3, June 2007, pp. 244–254, doi:10.1177/1527002506286774. https://journalssagepubcom.ezaccess.libraries.psu.edu/doi/abs/10.1177/1527002506286774#articleCitationDownloadContainer

Minitab Blog Editor. “How to Correctly Interpret P Values.” *Minitab Blog*, Minitab, 17 Apr. 2014, blog.minitab.com/blog/adventures-in-statistics-2/how-to-correctly-interpret-p-values.

Minitab. “Interpret the Key Results for Correlation.” *Minitab Express*, Minitab, 2019, support.minitab.com/en-us/minitab-express/1/help-and-how-to/modeling-statistics/regression/how-to/correlation/interpret-the-results/.

Rappaport, Jordan, and Chad Wilkerson. "What are the benefits of hosting a major league sports franchise?." *Economic Review-Federal Reserve Bank of Kansas City* 86.1 (2001): 55-86. http://49ers.savesantaclara.org/pdf/WhatAreTheBenefitsOfHosting.pdf

Soshnick, Scott, and Eben Novy-Williams. “The NFL Nears $25 Billion Revenue Goal Ahead of Super Bowl.” *Chicagotribune.com*, Chicago Tribune, 18 Aug. 2019, www.chicagotribune.com/sports/ct-spt-nfl-revenue-super-bowl-20190128-story.html.

Stephenson, Jesse, "Letting Teams Walk: Exploring the Economic Impact of Professional Sports Franchises Leaving Cities" (2014). MPA/MPP Capstone Projects. 25. https://uknowledge.uky.edu/cgi/viewcontent.cgi?article=1024&context=mpampp_etds

U.S. Census Bureau. “About.” *The United States Census Bureau*, 15 Oct. 2018, www.census.gov/programs-surveys/metro-micro/about.html.

ACADEMIC VITA
WESLEY S. ALEXANDER

EDUCATION

The Pennsylvania State University | Schreyer Honors College **University Park, PA**
Smeal College of Business *Class of 2020*
Major: Intended Bachelor of Science, Finance
Minor: Corporate Innovation and Entrepreneurship, New Ventures

RELEVANT EXPERIENCE

PricewaterhouseCoopers LLP. **New York, NY**
M&A Management Consulting Summer Intern *June 2019-August 2019*

- Worked in the Mergers & Acquisitions Transactional practice, performing target and operational due diligence, acquisition integration and divestiture management
- Supported two private-equity clients through acquisition targeting, operational diligence and post-sign divestiture oversight
- Key advisory competencies included: business strategy, operations, customer and marketing, human capital and finance

The Uncommon Individual Foundation **Philadelphia, PA**
Summer Business Analyst *May 2018-August 2018*

- Supported 4 start-up companies in a consulting and project management capacity as part of a non-profit, start-up incubator
- Created and presented an investor pitch to a panel of venture capitalists and industry professionals at a Philadelphia MedTech conference while completing a $1 million private equity backed funding round for Narbis, Inc. a neurotechnology startup
- Built annual financial statements and forecasted future financial results for Narbis, Inc. to present to potential investors
- Coordinated the market research, product design, testing and commercial launch of a motorcycle product for Kovarvic, Inc.

Leveraged Lion Capital **University Park, PA**
Associate Analyst *Spring 2018-Fall 2019*

- Selected as one of 8 analysts from over 120 applicants to be a portfolio manager in the nation's first student-run syndicated loan portfolio, partnering with Bank of America Merrill Lynch and the Loan Syndications and Trading Association (LSTA)
- Analyzed the structuring of leveraged loans, credit agreements, prepared financial models for prospective investments, and tracked debt markets, utilizing data from Bloomberg Terminal, FactSet, SEC filings, and S&P Global Market Intelligence
- Collaborated in preparing monthly research reports, provided to financial professionals, outlining market trends, holdings commentary and portfolio analysis
- Created and presented pitches to the organization, examining company and industry analysis, fundamental credit drivers, comparable company technical analysis, key covenant call-outs, risk considerations and financial model analysis

Penn State Investment Association **University Park, PA**
Analyst *Fall 2017-Fall 2019*

- Engaged in weekly performance meetings led by the Nittany Lion Fund, a $7.4 million equities-focused student-led fund
- Gained exposure to market trends, due diligence and equity analysis through investment simulations and breakout sessions

Kantar Consulting **New York, NY**
Cultural Streetscaper *March 2017-March 2018*

- Collected primary research and testimonials as part of a network of over 400 analysts for a global consulting firm
- Investigated and reported on market trends and demographics in response to projects submitted by various companies

LEADERSHIP AND ACTIVITIES

Sigma Chi Fraternity **University Park, PA**
Philanthropy Chair *Fall 2017-Fall 2018*

- Led philanthropic efforts of the fraternity, raising over $16,000 and organizing over 450 hours of community service
- Monitored accreditation of the chapter, meeting various community service and educational programming requirements

Scholarship Chair *Fall 2017-Fall 2018*

- Managed academic standing of the chapter, increasing GPA of new members to a 3.26 average, a 19% increase
- Maintained a pre-approved Academic Achievement Plan and reported progress for the semester to the University

Vanguard **Malvern, PA**
Student Participant, EXPLORE Program *March 2018*

- Selected among peers to participate in an early talent identification program while gaining exposure to the financial industry

ADDITIONAL INFORMATION

Interests: Reading, Penn State Club Lacrosse, Philadelphia Sports, *Game of Thrones*, Travel, Music and Production