The Economic Impact of Recessions on Major League Sports in the United States

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ABSTRACT

Income is one of the most significant factors affecting consumer purchasing decisions. Entertainment expenses are generally the most affected by changes in disposable income. When consumers have more income at their disposal, they are more likely to spend it on entertainment. When consumers have limited income, they would rather save it for necessary expenditures. This paper will explore three measures of the effect of income on major league sports activity from 1991-2011. Most specifically, it will investigate if the recent Great Recession, among other recessionary periods in the United States, had an impact on the Fan Cost Index and the Housing Price Index. The Fan Cost Index (FCI) tracks the average cost of attendance to attend a particular sporting event for a family of four, while the Housing Price Index (HPI) is a measure released by the US Federal Housing Financing Agency that gives a broad measure of the movement of single family housing prices. Overall, this paper will look at these indexes in order to determine if an economic recession plays a key role in influencing consumer spending and attendance on major league sports.

INTRODUCTION

American sports are a multi-billion dollar industry that has a widespread impact on many people across the United States and even foreign countries. The entire industry is kept alive and running because of the support of fans who expend their hard earned income to go out to a game and watch their favorite team battle for victory. What happens if those fans who maintain the foundation of the industry start losing their hard-earned income because of an economic recession? Recessions are a near certain occurrence in all economies of the world at some point and when looking at the U.S, recessions can have a substantial impact on various industries of the economy, including sports. When a recession strikes, consumers will curb their spending on entertainment and focus on saving money for necessary expenditures, regardless of their financial status (Hong, Mondello, & Coates, 2011)[1]. Although the sporting industry may seem infallible, they are just as vulnerable to the impacts of a recession as any other business or industry in the world.

With the "Great Recession" of 2008 in the U.S, the economy was devastated by a severe decline in housing prices, which in turn, lead to a decline in the overall state of the economy, brutally reducing consumer spending as the average family income plummeted almost 17% between 2007 and 2009 (Nakajima, 2013)[2]. Even the sectors that had previously been "recession-proof" in the past were punished during this recent crisis (Linn, 2008)[3]. It seems like people would still flock to sports in order to escape the inevitable reality that they were losing money and the economy was in shambles around them, yet many may find it difficult to give up the additional money it costs to actually attend a sporting event. This could dramatically reduce attendance and inherently affect the overall bottom line for teams. For the sports franchises across America, economic recessions force owners and leagues to make tough decisions in order to accommodate the fans and continue to draw them to their venues to watch games; one of these decisions includes reducing the costs to attend an event.

The purpose of this paper is to look at what impact recessions in the United States have on consumer spending in the major sports leagues and if sports franchises lowered or raised their prices in accordance with the overall economic state. This paper will test three general hypotheses. First, this study will look at the relationship between attendance at the four major league sports franchises (NFL, NBA, MLB, and NHL) and U.S. housing prices; the housing prices will be the variable that represents the overall state of the economy. Second, this study will analyze

the relationship between the housing prices and the cost to attend a single game for each of the sports leagues. Third, this paper will test the relationship between local housing prices in each city with the average ticket prices to attend home sporting events.

This paper proceeds as follows. Section 2 will take a look at what is currently known about the sports industry and effects of the economy as found in previous research. Section 3 describes the data used and will introduce the empirical analysis and specifications. Section 4 presents the empirical results and their interpretation. Section 5 will offer concluding remarks and Section 6 will discuss research limitations and suggestions for expanding on this study.

LITERATURE REVIEW

Previous research has attempted to take a look at the different aspects surrounding a team and their fans during periods of economic recession. Furthermore, research looks at the numerous ways that franchises generate income and how they use fundamental economics to help keep their generally inelastic demand curve in balance with prices. A sports franchise has many different avenues to generate revenue from fans once they attract a fan to their stadium. Aside from actual ticket sales, the team gets a portion of the revenue derived from concessions, merchandise or memorabilia sold within the venue, and from parking if they have a private parking lot. For this reason, Park, Lee, and Miller (2013)[4] describe sports franchises not as single-product producers, but are instead multi-product producers that have their tickets priced in the inelastic portion of their demand curve. They also found through their research that if a team prices their tickets in the elastic portion of the curve, they can actually raise their profit margins by decreasing prices, as long as the costs of serving fans at the margin is close to zero. This would mean that in a recessionary period, if the demand curve becomes more elastic, a team may lower their ticket prices in order to do two things: continue to draw fans to the stadium and maintain profits at the same time.

In a market where sports franchises are constantly raising their prices for tickets and concessions, lowering ticket prices, even keeping them constant, will only work to a limited extent to draw fans to games. Mellinger (2009)[5] describes that during the most recent recession in the United States teams practically had to give away tickets for free in order to fill the seats. New Jersey Nets (the now Brooklyn Nets) fans who were unemployed received free tickets and New Orleans Saints fans were able to buy theirs on layaway. During the 2008 season, Mellinger (2009)[5] found that the MLB's overall attendance dropped for the first time in a five year span and the NFL saw a significant decline in ticket sales, proving that the sports industry was not immune to the recessionary effects like they previously thought.

Cantor and Rosentraub (2012)[6] also concluded that the U.S. sports industry is not recession-proof in their research, which proved the inelasticity of demand diminished and became much more elastic than during normal economic periods. They also found that as the overall economy contracts, so does overall attendance at baseball games; this means that baseball during this period fared no differently than other types of businesses who saw losses from the recession. With this research, along with Park, Lee, and Miller's (2013)[4], it would only make sense for a team to start lowering ticket prices in order to maintain a reasonable level of attendance in order to generate necessary revenues from ticket receipts.

Not only are ticket prices and attendance big areas of concern for teams during a recession, but their concession stand prices can be affected as well. Steinbach (2009)[7] confirms this when he described how teams in the MLB are trimmed back on concession prices in order to satisfy fans and increase attendance figures. If fans can't afford a soda, hot dog, or popcorn when they go to games, they might as well just stay at home where these items are not double or triple the price.

Steinbach (2009)[7] also stated that teams were utilizing the fast food idea of "dollar menus" and offering bundled prices to save on food items, as shown by the San Diego Padres who offered the "Padres Stimulus Package" which offered a hot dog, soda, popcorn, peanuts, and a cookie for only $5. Also, on an individual team basis, the New York Mets saw a 15 to 29 percent decrease in concession prices, even though they were just breaking in their brand new $850 million ballpark. This proves just how big of an impact the recession actually had for the Mets because as Rishe and Mondello (2003)[8] found, playing in the first year of a new stadium, as well as many other factors such as fan income levels and population size, usually leads to rising prices for sports venues. It would only make sense that teams all around the MLB and even in other sports saw this same type of decrease in their concession prices. While this data, as well as a lot of sports economics data is baseball-oriented, it would not be a stretch to say that the impacts of the recession had a profound effect on the entire sports industry and made owners become incredibly conscious of the decisions that were being made, as well as the effect they have on attendance and fan cost.

METHODS

This research investigated the relationship between housing prices, attendance levels, average ticket price, and average amount spent per game for each of the four major sports leagues (NFL, NBA, MLB, and NHL) across the nation.

The Housing Price Index (HPI), published by the U.S. Federal Housing Finance Agency was used to indicate housing prices. The HPI is a measure of changes in average home prices throughout 363 metropolises in the United States. It is important to make a note that his measure does not include the cost of rental properties, as they may cause different results because their prices may move opposite of actual housing prices. The average amount spent per game was measured by the Fan Cost Index (FCI). The FCI indicates the amount of money spent per outing for a family of four. This number includes two adult average price tickets, two child average price tickets, four small soft drinks, two small beers, four hot dogs, two programs, parking, and two adult-size caps.

In order to compare the HPI to the three dependent factors, this study used linear regression. The cities of the main teams in each of the leagues were organized by HPI, attendance levels, average ticket price, and the FCI for each year. Most of the data started in 1991-1992 and went through 2011-2012. Since city size can have an effect on income, and thus affect housing prices, attendance, average ticket price, and the FCI, the data was organized by change per year. For example, when comparing the HPI and attendance levels in Boston, the change in HPI between year 1992 and 1993 was compared to the change in attendance levels in Boston between year 1992 and 1993. This method helps control for the "big city effect," in which housing prices and ticket prices are more expensive, along with the attendance figures being much higher in large metropolitan areas compared to smaller markets.

(1) $\Delta\text{Attendence} = \alpha + \beta * \Delta HPI + \varepsilon$

(2) $\Delta\text{TicketPrice} = \alpha + \beta * \Delta HPI + \varepsilon$

(3) $\Delta\text{FCI} = \alpha + \beta * \Delta HPI + \varepsilon$

RESULTS

This study was trying to determine if there is a significant relationship between the independent variable, HPI, and the three dependent variables. If a significant relationship was found during the linear regression analysis, it indicated that recessions have an impact on that sector of the sports league. When originally preforming these tests, we hypothesized that all of the factors would be related to HPI. Furthermore, we assumed that all of the coefficients would be positively related to HPI. We hypothesized that for every increase in HPI, there would be a positive increase in average attendance, ticket price, and FCI.

The null hypothesis for all of the tests was that HPI has no effect on the dependent variable - attendance levels, average ticket prices, or the FCI. If the p-value of the ANOVA test was less than .05, we had statistically significant evidence to reject the null hypothesis and conclude that HPI has an effect on the dependent variable.

According to our empirical results, we confidently reject the null hypothesis that HPI has no effect on NFL and MLB attendance **(See Table 1and 2, below).** This means that as housing price values increase, attendance levels at NFL and MLB games also increase. We can therefore assume that when housing prices decrease in a recession, attendance at NFL and MLB games will also decrease.

We also rejected the null hypothesis for NHL average ticket price **(See Table 3, below**). This means that as housing price values change, the average ticket price at a NHL game will also change. In a recession when housing price values decrease, we can assume the average ticket price for NHL games will also decrease.

The R- squared statistic describes how accurate the model fits the data. For the HPI to NFL attendance relationship, the R- squared number is 1% which suggests the model explains very little of the variability of the In the case of response data around its mean. The HPI to MLB attendance R-squared number is also 1%. Lastly, the HPI to NHL average ticket price R-squared number is 1.5%. The respective R-squared numbers are interesting to note because the ANOVA p-values suggested a linear relationship between these three variables.

The constant coefficients indicate the average level of the dependent variable when the change in HPI is 0. The constant coefficient for the average NFL attendance levels compared to HPI is -699.377 **(See Table 4, below).** This means that when the HPI is 0, the average attendance at games will be 0 as well. The constant coefficient for the average MLB attendance levels compared to HPI is 10,076.485 **(See Table 5, below).** It is interesting to note because it indicates that even if the HPI is 0, fans will still attend baseball games. Lastly, the constant coefficient for average ticket price at NHL games compared to HPI is -1.279 **(See Table 6, below).** This also means that when HPI is 0, the average ticket price will be approximately 0 as well.

The other coefficients represent the amount of change of the dependent variable when the HPI changes by1. For example, when HPI changes by 1, the average NFL attendance level increases by approximately 275.992 **(See Table 4, below).** Additionally, when HPI changes by 1, the average MLB attendance level increases by approximately 2,552.252 **(See Table 5, below).** Once again, it is interesting that MLB attendance increases much more for every increase in HPI than NFL attendance. This could be due to the amount of MLB games in a season, or the cost of attendance. When HPI increases by 1, the average ticket price of NHL games decreases by .050 **(See Table 6, below).** This is also an interesting find as we would instead expect ticket prices to increase as the economy and HPI grows.

Table 1. ANOVA HPI Compared to NFL Average Attendance

Model	Sum of Squares	DF	Mean Squares	F	Sig.
Regression	8052099357	1	8052099357	4.861	.028
Residual	7.686E+11	464	1656542378		
Total	7.767E+11	465			

Table 2. ANOVA HPI Compared to MLB Average Attendance

Model	Sum of Squares	DF	Mean Squares	F	Sig.
Regression	7.061E+11	1	7.061E+11	4.765	.030
Residual	7.202E+13	486	1.482E+11		
Total	7.273E+13	487			

Table 3. ANOVA HPI Compared to NHL Average Ticket Price

Model	Sum of Squares	DF	Mean Squares	F	Sig.
Regression	164.825	1	164.825	4.241	.040
Residual	10531.842	271	38.863		
Total	10696.667	272			

Table 4. HPI and NFL Average Attendance Coefficients

Model	Unstandardized Coefficients	Unstandardized Coefficients	Standardized Coefficients	T	Sig.
	B	**Std. Error**	**Beta**		
(Constant)	-699.377	1960.296		-.357	.721
Change HPI	275.992	125.182	.102	2.205	.028

Table 5. HPI and MLB Average Attendance Coefficients

Model	Unstandardized Coefficients	Unstandardized Coefficients	Standardized Coefficients	T	Sig.
	B	**Std. Error**	**Beta**		
(Constant)	10076.485	18559.912		.543	.587
Change HPI	2552.252	1169.245	.099	2.183	.030

Table 6. HPI and NHL Average Ticket Price Coefficients

Model	Unstandardized Coefficients	Unstandardized Coefficients	Standardized Coefficients	T	Sig.
	B	**Std. Error**	**Beta**		
(Constant)	-1.279	.384		-3.333	.001
Change HPI	-.050	.024	-.124	-2.059	.040

CONCLUSIONS

Overall, the results of this study indicate that some variables are affected by changes in house values; since the HPI reflects the changes in house values throughout the nation, the data can be used to reflect changes in the economy. The results have shown that HPI affect NFL and MLB attendance levels, as well as the average ticket prices at NHL games. A potential reason behind these results in the NFL and MLB could have to do with what Mellinger (2009) found in his research that even if owners and teams lower their ticket prices and offer specials, the attendance will still drop regardless. This just goes to show how much of a psychological impact a recession has on Americans because even if they could get a good deal on tickets, concessions, etc, they still choose to resist going to a sporting event to feel like they are utilizing their money wisely and not for entertainment.

As for the results shown in the NHL, they seem to be a product of the weakness in popularity among the big four U.S. sport leagues. Hockey is not normally the average person's first thought when picturing American sports and because of this, the NHL had to take necessary steps to compete with the other leagues during the recessions, which meant lowering ticket prices. This is especially true because a majority of the NHL season conflicts with the NBA season, which can add more of strain to NHL team, as fans can find tickets to NBA games for significantly cheaper prices than NHL games. To combat all of this, the NHL had to give fans more "bang for their buck" and create more value by lowering ticket prices, hoping to attract them to their venues over basketball games.

It's interesting to note that while average attendance levels and ticket price are related to HPI, the FCI wasn't found to be correlated with HPI. This implies that even in recessions, if people go to the games, they will still spend the same amount of money as they would in non-recession times. This suggests that people go to the sporting games in order to have the entire fan experience. If fans don't have the money to spend on food and drinks in addition to the cost of a ticket, they will just stay at home instead.

Another interesting finding of this study is that NBA attendance levels, average ticket price, and FCI were found to not be related to HPI. This could be due to a variety of factors such as cost of game attendance, fan interest, and the average income levels of NBA viewers.

LIMITATIONS

One limitation of this study included the type of data used to conduct our analysis. We used two different indexes (HPI and FCI) which are "average" representations of the housing market and costs to attend sporting events, yet there are more than likely better, more in-depth indicators of economic performance and total cost to fans. This type of information would require immense amounts of time and analysis, which led us to our second limitation: time. When conducting a research study of this nature, one that expands four major sports and a period of twenty years, it can be difficult to squeeze every bit of information from the data in such a limited amount of time. However, this study did provide solid analysis of the research questions at hand and can hopefully be used to be expanded on in the future.

Overall, the data clearly shows that the sports world is not in a sense "recession-proof" that economists once believed them to be. With the results found in this study, it is apparent that teams across different leagues felt an impact on attendance and ticket prices when the housing market and economy spiraled downward in the most recent Great Recession. The important takeaway from these specific results is that league officials and sports franchise owners need to be aware that economic recessions are a natural occurrence in the U.S. economy and when this happens, even if it is not as extreme as the 2008 recession, it can have a financial impact on every team's bottom line.

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