The Effect of Sports Franchises on Property Values: The Role of Owners versus Renters

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Abstract

This paper estimates the public benefits to homeowners in cities with NFL franchises by examining housing prices rather than housing rents. In contrast to Carlino and Coulson (2004) we find that the presence of an NFL franchise has no effect on housing prices in a city. Furthermore, we also test whether the presence and size of the subsidy to the team affects values and find that higher subsidies for NFL stadium construction lead to lower house prices. This suggests that the benefits that homeowners receive from the presence of a team are negated by the increased tax burden due to the subsidies paid to the franchises.

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Introduction

The past two decades have witnessed a massive transformation of the sports infrastructure in North America. Twenty-nine of the 32 teams in the National Football League (NFL) will start play in the 2010 season in a stadium newly constructed or significantly refurbished since 1992. The price tag for this stadium boom stands at nearly $10 billion of which taxpayers have contributed over 60% of the total construction costs. In addition, governments routinely subsidize professional sports franchises through below-cost lease deals, preferential tax treatment, and even direct cash payments. Given the large public subsidies involved, economists have devoted considerable effort into uncovering whether or not the economic benefits of sports stadiums and franchises warrant these handouts.

While team and leagues often publicize economic impact studies that purport to show large benefits from stadiums and franchises, the overwhelming majority of academic studies have found little or no direct economic benefits from either sports teams or new facilities. For example, previous studies of employment (Baade, 1996; Baade and Sanderson, 1997; Coates and Humphreys, 2003), personal income (Baade, 1996; Coates and Humphreys, 1999, 2001; Lertwachara and Cochran, 2007), taxable sales (Baade, Baumann, and Matheson, 2008), and hotel occupancy rates (Lavoie and Rodriguez, 2005) have all found that stadiums and franchises have insignificant effects on real economic variables.

Of course, while the economic benefits (or lack thereof) of sports franchises are touted by sports boosters, it is entirely possible that the primary social benefits of sports teams are indirect or intangible. Sports franchises can be considered a cultural amenity that may promote civic pride, result in a vibrant and dynamic city, and improve the livability of a metropolitan area. In other words, sports may not make you rich, but they may make you happy. Of course, such

indirect benefits are generally hard to measure as they are non-marketed goods. Yet, it is important to accurately and completely estimate these benefits in order to test whether the costs of getting and keeping a sports franchise outweigh the benefits to the city that hosts the team.

With this idea in mind, and given the lack of evidence of direct economic impact, other researchers have turned to a variety of methods to measure the indirect economic impact of sports franchises. Johnson, Groothius and Whitehead (2001; 2004) and Johnson, Mondello and Whitehead (2006) use contingent valuation to estimate the benefits of the presence of a sports franchise for local citizens. While the survey data show that local residents would be willing to pay significant sums to have a professional sports franchise in their city, in each study the observed willingness to pay was less than the amount of the public subsidy.

A second broad technique encountered in the existing economics literature for identifying the indirect benefits of a sports team is that of hedonic pricing. Hedonic methods estimate non-marketed benefits by observing marketed goods that are impacted by the non-marketed benefits one desires to estimate. In terms of sports franchises, the hedonic approach utilizes the fact that goods that provide positive externalities will increase house values in a city while simultaneously allowing wages to decrease. If sports franchises provide significant public benefits to their host cities, then these benefits will be capitalized into the value of housing in areas with professional sports teams as people are willing to pay more to live in cities with valuable cultural attractions. Similarly, people may be willing to work for lower wages in cities with a high standard of living. By using the hedonic technique to estimate the compensating differential, an estimate of the benefits can be made, and the estimated willingness to pay can then be used to calculate a dollar value for the public benefits the franchise provides to the city.

Carlino and Coulson (2004) provide the first such attempt to measure the benefits of sports franchises using hedonic pricing. They utilize rental values and report that the presence of an NFL team in a city increases rents by a statistically significant four to eight percent; thus the franchises generate a positive externality. The authors report that the franchises create $139 million on average per year (p. 45). However, these numbers capture the perceived benefits to renters and landlords, not to homeowners. Since nearly 70% of all Americans own their own homes (Hoover.org), it is crucial that the benefits to owners are also measured. In addition, if the teams are subsidized through public spending, those costs might be capitalized differently for owners than for renters (Welch, Carruthers and Waldorf, 2007).

This paper therefore estimates the public benefits to homeowners in cities with NFL franchises by examining housing prices rather than housing rents. In contrast to Carlino and Coulson we find that the presence of an NFL franchise has no effect on housing prices in a city. Furthermore, we also test whether the presence and size of the subsidy to the team affects values and find that higher subsidies for NFL stadium construction lead to lower house prices. This suggests that the benefits that homeowners receive from the presence of a team are negated by the increased tax burden due to the subsidies paid to the franchises.

Background

As noted previously, Carlino and Coulson's (2004) analysis utilizes housing rental data from the American Housing Survey (AHS) and finds that the presence of an NFL franchise is associated with an increase in rental prices of between four and eight percent. They do not find a statistically significant impact on wage rates in the cities studied. In a comment on the Carlino and Coulson paper, Coates, Humphreys and Zimbalist (2006) point out that by cleaning the

rental data and removing units with very low rents, the impact of the NFL on rents disappears. In their reply, Carlino and Coulson (2006) report that after cleaning the data as suggested by Coates et al the NFL effect remains. They state that the difference in results might be due to a different method of clustering the standard errors.

As mentioned by Coates et al., it would be interesting to see if the impact on property values is similar to that seen on rents. They suggest that this would be likely since there should be a high degree of correlation between rents and values. Testing this is possible since the American Housing Survey contains data on house values as well as rental prices. Carlino and Coulson give two reasons for using rental data rather than property data: they are concerned both about the accuracy of owner-stated values and about the speed with which information about the location of a franchise is incorporated in values.

The first concern is unwarranted as Kiel and Zabel (1999) have shown that owners-stated values are quite unrelated to characteristics of the house or the neighborhood. Thus hedonic regressions based on owner-stated values will yield reliable estimates of the impact of sports franchises on house values.

The second concern is more problematic. Carlino and Coulson argue that rents "will go up only upon the arrival of the team" (page 33) whereas values will increase when the arrival of the team is anticipated, or is merely a rumor. Dehring, Depken and Ward (2007) show that house values are impacted by the rumors of a new stadium, so it is likely that values respond earlier in the process than do rents which would make modeling the timing of the arrival and departure of franchises more difficult.

However, from a theoretical standpoint it is unclear whether the impact on values would be the same as that on rents (even if the timing issue was resolved) since expenditures on public

goods such as education can be capitalized differently in the two types of housing. As Welch, Carruthers and Waldorf (2007) show, spending on public protection and capital facilities increase both rents and values, but "factors affecting the exchange value of housing" impacts values while "the rental market responds more to factors that affect the use value of housing" (page 149). Thus it is possible that, for those franchises that come with increased public spending, the impact may differ between owners and renters.

In examining the literature on implementing the hedonic technique, several authors discuss whether rents or values should be used. Freeman (1993) states that market transactions data (such as reported rents) are preferable but that since a "majority of residential housing is owner-occupied" (page 375) housing values should also be used. Taylor (2003) points out that rental prices can be used, but points out that "while future changes in amenities may be capitalized into sales prices, they are not expected to be capitalized into rents" (page 341). Thus using rents rather than house values does change the interpretation of the estimated coefficients.

This paper replicates the Carlino and Coulson model using house values rather than rents. One would expect that the results would be quite similar, assuming that rents and values are correlated within any given metropolitan area. However, if owners view the public benefits or costs of a franchise differently than do renters, the results could be different.

Model

In order to test for the public benefits of a local sports franchise, we use the hedonic technique (Rosen, 1974). We control for the characteristics of the house and the area in which it is located that explain the value of the house. We can then include variables on the existence of a franchise in order to estimate the benefits, if they exist. The model to be estimated is

$\ln(\text{value}) = \beta_0 + \beta_i(\text{housing characteristics}) + \beta_j(\text{city characteristics}) + \beta_k(\text{NFL franchise}) + \beta_l(\text{year dummy variable}) + \beta_m$ (city dummy variable)

This model is similar to that specified by Carlino and Coulson with the exception that the owner stated value of the house is the dependent variable rather than the stated rent paid. A priori, we have no reason to believe that our results will differ from theirs; rather our results are expected to provide a verification of theirs.

Using the 1993 and 1999 American Housing Survey data sets, we collected information on the 53 cities that Carlino and Coulson included. Houses in those cities are included in our regressions if they were a single family home that was occupied at the time of the interview. We removed observations that did not report any bedrooms or bathrooms and those that were in areas where we were unable to find data on crime or taxes. Over 8000 observations remain. Table 1 provides a list of the variables included in our regressions along with descriptive statistics. Because not all of Carlino and Coulson's variables were well defined in their paper, we approximated them as best we could. However, since the means for some of our variables differ from theirs (e.g. population growth rate), it is likely that we are not including exactly the same variables, but we should still be controlling for similar impacts. We have also added the percent of the population in the city that is black, as well as whether the unit has a basement and whether the owner reports leaks in the unit. We did not include whether the unit has a garage, is detached, is in a low or high risk building, or includes monthly electricity costs in the rent. We also do not include the resident-reported neighborhood crime and noise variables, nor whether

the unit is rent controlled or is subsidized. Thus we expect the same signs but not necessarily the same coefficients.

Multicollinearity is a potential concern with this data set. Carlino and Coulson mention multicollinearity between the NFL variable and air quality as a reason why some of their coefficients are not statistically significant (page 42). In our data set the only variables with correlations above 0.5 are Age and Age2, Yr93 and Unemp, Yr93 and PCPI, and Crime and Unemp. Thus it seems unlikely that simple collinearity will cause problems in our estimated regressions.

In Table 2 we list those SMSAs that saw changes in professional sports franchises between 1993 and 1999. In the NFL there were six cities that took teams in while four cities lost their franchises. All of the cities that gained teams did so at a cost; our table shows the dollar value of subsidies that were required by the franchises in order to move. These monies were primarily spent on the construction of new stadiums for the relocating team.

In this paper we do not estimate our equation for different geographic definitions; rather we utilize all houses in the SMSA available in the data set. We do this because the existence of the franchise should yield the same public benefits throughout the area; however, the tax implications due to the development of a new stadium can differ. Given that we have stadiums built in both urban areas (Jacksonville) as well as suburban areas (none?), we felt it best to look at the largest area possible.

Our results are presented in Tables 3 and 4. In the first column of Table 3 we estimate the model (with White standard errors) including the house's characteristics, neighborhood characteristics, and city characteristics as well as city dummy variables. The results are generally as expected; the age of the house affects value in a nonlinear fashion, bathrooms and

bedrooms as well as air conditioning increase the value while abandoned buildings and trash in the neighborhood decrease the value. Higher income in the area leads to higher values, while higher spending relative to taxes decreases the value. Metropolitan areas with larger rates of increase in population have higher values, while areas with higher unemployment have lower values.

The variable of interest is NFL; our results show that the presence of an NFL franchise in the SMSA does not impact owner-occupied home value as the estimated coefficient is not statistically significant. This contradicts Carlino and Coulson's finding that rents increased by four to eight percent due to the presence of an NFL franchise. In the second column we estimate the regression but cluster the standard errors by SMSA (Wooldridge, 2002). Again, the NFL coefficient is statistically insignificant.

It is possible that our estimated coefficient on NFL is statistically insignificant because homeowners view the benefits of the franchise differently than do renters. Welch, Carruthers and Waldorf (2007) report that owners and renters do seem to respond differently to different types of public goods, with the expenditures of all public goods being capitalized into values rather than rents. As they state "homeowners, by far, bear most of the costs and enjoy the financial benefits of service provision while renters, by and large, do not" (page 145). They suggest that "the ownership market responds to factors affecting the exchange value of housing…. while the rental market responds more to factors that affect the use value of housing" (page 149). In the case of a new NFL franchise, the public subsidy provided to obtain the franchise will likely be borne by the owners of housing; in this case we would expect the franchise to provide positive public benefits but also negative costs. Thus the overall impact on owners could be zero, as we have estimated.

To test this hypothesis we include a variable that measures the amount of subsidy an SMSA has paid to entice the franchise to their location. We can test whether these subsidies result in increased local taxes, which are then capitalized into the house values. In Table 4 column 1 we report the results from the equation which also controls for the amount of the subsidy that the team required (SUB). The NFL coefficient is still statistically insignificant; however the estimated subsidy coefficient is negative and is statistically significant. This indicates that those areas which have publicly funded the franchise do see a decrease in house values of 0.091 percent. This is similar in magnitude to a one percent increase in the black population in the city. In column 2 we estimate the same equation using the cluster technique for the standard errors as before, and the results do not change.

Conclusions

In this paper we extend the work by Carlino and Coulson who suggest that sports franchises are public goods that increase the quality of life in an area by examining the impact of the franchises on housing values rather than rents. We find that the presence of an NFL franchise does not lead to higher house values, all else held constant. We then test whether those franchises that required public subsidies impact house values differently and find that higher subsidies lead to lower house prices. This suggests that even if franchises do create positive externalities, the capitalization of the required subsidies cause house prices to remain, on average, unchanged.

Our results, when combined with those obtained by Carlino and Coulson, suggest that in order to capture all costs and benefits of a sports franchise to an area, one must examine the impact on both owners and renters. These two groups perceive the costs and benefits differently,

as others have found with other types of public goods. Indeed, the presence of an NFL team may not be as beneficial to local residents as previous research has concluded.

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Table 1

Descriptive Statistics

Variable	Description	Mean	St. Dev.	Min.	Max.
LNVALUE	Log of market value of house (Source: AHS)	11.76	0.83	0.69	13.21
AGE	Age of house (Source: AHS)	40.82	21.40	0	80
AGE^2	Age of house squared	2,124.623	1,873.857	0	6,400
AQI	Air Quality Index which measures the number of days that the index is greater than 100 (Source: U.S. EPA)	41.34	31.97	0	189
BATHS	# of full bathrooms in unit (Source: AHS)	1.66	0.72	1	10
BEDRMS	# of bedrooms in unit (Source: AHS)	3.18	0.83	1	10
BLK	Percent of population that is black (Source: 1990 data are from 1998 State and Metro Data book, 1998 data are from the 2000 Statistical Abstract of the U.S.)	14.29	7.56	1	42.2
CRIME	Violent Crimes per 100,000 Source: FBI website and 2000 State and County Data book).	817.97	375.47	253.6	2,470
DABAN	=1 if owner reports abandoned buildings in neighborhood, =0 otherwise(Source: AHS)	0.036	0.19	0	1

DAIRSYS	=1 if house has air conditioning, =0 otherwise (Source: AHS)	0.58	0.494	0	1
DCELLAR	=1 if Unit has a basement =0 otherwise (Source: AHS)	0.48	0.50	0	1
DHOLES	=1 if owner reports holes in walls, =0 otherwise (Source: AHS)	0.006	0.08	0	1
DJUNK	=1 if owner reports trash in neighborhood, =0 otherwise (Source: AHS)	0.078	0.27	0	1
DLEAK	=1 if owner reports leaks in unit, =0 otherwise (Source: AHS)	0.16	0.37	0	1
DPUBSEW	=1 if house is on public sewer, =0 otherwise (Source: AHS)	0.923	0.27	0	1
HALFB	# of half bathrooms in unit (Source: AHS)	0.46	0.59	0	10
NFL	=1 if NFL team is located in city, =0 otherwise	0.64	0.48	0	1
PCPI	Per Capita Personal Income (Source: Bureau of Economic Analysis)	29,251.64	5,111.761	17,918	43,193
POP	Population of SMSA (Source: U.S. Census Bureau)	5,197,436	4,853,287	846,227	20,102,875
POPCHCC	Change in population from 1980-1990 for 1993 Obs. & 1990-1996 for 1999 Obs.	0.097316	0.1084436	-0.2835	0.6729
SUB	Public subsidies given to NFL franchises from	12.99171	49.21137	0	244

	1993-1999 (Source: Long 2005)				
SPNDTAX	Log(spending per capita) – log (taxes per capita) (Source: 1992 data are from the 2000 Statistical Abstract of the U.S., 1996 data are from the 2000 City and county data book)	0.89	0.24	0.43	1.711
YR93	=1 if year is 1993, =0 if year is 1999	0.25	0.43	0	1
UNEMP	Unemployment rate in the county (Source: BLS)	5.11	1.79	1.4	12.2
City Fixed Effects					

* Sources: American Housing Survey, U.S. Census Bureau, FBI Uniform Crime Reports, Bureau of Labor Statistics, Statistical Abstract of 2000, City and County Data Book 2000, Long (2005), Matheson Data

Table 2

NFL Franchises that Moved During Time Period

City/League	Franchise In	Franchise Out	Subsidy (in millions)	Subsidy Details
Jacksonville	1995		166	City bond issue, state rebate, lodging tax, ticket surcharge
San Francisco	1995		213	City and county bonds
St. Louis	1995		322	Bonds: Backed 25% by city (convention center activities), 25% by county (hotel tax), 50% by state
Baltimore	1996		203	State of Maryland backed tax exempt revenue bonds
Nashville	1997		213	Hotel/motel sales tax
Cleveland	1999		244	County sales tax
LA		1995		
Milwaukee		1995		
Cleveland		1996		
Houston		1997		

*Data compiled from Long (2005), National Sports Law Institute, LeagueofFans.org, Ballparks.com

Table 3

Regression Results

lnvalue	White Standard Error				Clustered Error			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t-stat	P>t
age	-0.00362	0.001166	-3.1	0.002	-0.00362	0.002674	-1.35	0.182
age2	2.59E-05	0.0000142	1.83	0.068	2.59E-05	0.0000393	0.66	0.513
aqi	0.002169	0.0007194	3.01	0.003	0.002169	0.0014227	1.52	0.134
baths	0.286764	0.0185692	15.44	0	0.286764	0.0211005	13.59	0
bedrms	0.060342	0.0112175	5.38	0	0.060342	0.0126485	4.77	0
blk	-0.00717	0.0073482	-0.98	0.329	-0.00717	0.0163398	-0.44	0.663
crime	-4.7E-05	0.0000354	-1.33	0.182	-4.7E-05	0.0000573	-0.83	0.413
daban	-0.37558	0.045562	-8.24	0	-0.37558	0.0744939	-5.04	0
dairsys	0.199301	0.0176413	11.3	0	0.199301	0.0344345	5.79	0
dcellar	0.080611	0.0243769	3.31	0.001	0.080611	0.0283559	2.84	0.007
dholes	-0.06693	0.0861688	-0.78	0.437	-0.06693	0.0757248	-0.88	0.381
djunk	-0.25082	0.0264341	-9.49	0	-0.25082	0.0356605	-7.03	0
dleak	0.052421	0.0182187	2.88	0.004	0.052421	0.0238171	2.2	0.032
dpubsew	-0.18347	0.0303919	-6.04	0	-0.18347	0.0253539	-7.24	0
halfb	0.171	0.0168758	10.13	0	0.171	0.0156627	10.92	0
nfl	-0.03643	0.0490987	-0.74	0.458	-0.03643	0.1082864	-0.34	0.738
pcpi	2.59E-05	5.48E-06	4.72	0	2.59E-05	7.73E-06	3.35	0.002
pop	-1.08E-08	7.59E-09	-1.42	0.155	-1.08E-08	1.17E-08	-0.93	0.359
popchcc	0.40655	0.115908	3.51	0	0.40655	0.223595	1.82	0.075
spndtax	-0.27483	0.064465	-4.26	0	-0.27483	0.0972624	-2.83	0.007
unemp	-0.03812	0.0152783	-2.49	0.013	-0.03812	0.0266186	-1.43	0.159
yr93	0.113304	0.0610628	1.86	0.064	0.113304	0.1014961	1.12	0.27
_cons	10.61735	0.3025558	35.09	0	10.61735	0.5569778	19.06	0

*City Effects omitted from table

White	
# of Obs.	8662
F(71, 8590)	97.66
Prob > F	0
R-squared	0.4035
Root MSE	0.6412

Clustered	
# of Obs.	8662
F(21,49)	.
Prob > F	.
R-squared	0.4035
Root MSE	0.6412

Table 4

Regression Results

lnvalue	White Standard Error				Clustered Error			
	Coef.	Std. Err.	t-stat	P>t	Coef.	Std. Err.	t-stat	P>t
age	-0.00348	0.0011651	-2.99	0.003	-0.00348	0.0026547	-1.31	0.196
age2	2.46E-05	0.0000141	1.74	0.082	2.46E-05	0.000039	0.63	0.531
aqi	0.001868	0.0007186	2.6	0.009	0.001868	0.0014672	1.27	0.209
baths	0.287678	0.0186156	15.45	0	0.287678	0.0213985	13.44	0
bedrms	0.060108	0.0112286	5.35	0	0.060108	0.012719	4.73	0
blk	-0.00133	0.0074594	-0.18	0.859	-0.00133	0.0149607	-0.09	0.93
crime	-1.9E-05	0.0000372	-0.51	0.613	-1.9E-05	0.0000488	-0.39	0.702
daban	-0.37633	0.0454799	-8.27	0	-0.37633	0.0742878	-5.07	0
dairsys	0.198739	0.0176267	11.27	0	0.198739	0.0342516	5.8	0
dcellar	0.080146	0.0243785	3.29	0.001	0.080146	0.0284349	2.82	0.007
dholes	-0.0641	0.0858109	-0.75	0.455	-0.0641	0.0755384	-0.85	0.4
djunk	-0.25303	0.026357	-9.6	0	-0.25303	0.0348262	-7.27	0
dleak	0.053079	0.0182331	2.91	0.004	0.053079	0.023558	2.25	0.029
dpubsew	-0.18305	0.0303768	-6.03	0	-0.18305	0.0249489	-7.34	0
halfb	0.171323	0.0168607	10.16	0	0.171323	0.0156366	10.96	0
nfl	0.029021	0.0518698	0.56	0.576	0.029021	0.1076075	0.27	0.789
pcpi	1.89E-05	5.88E-06	3.22	0.001	1.89E-05	8.74E-06	2.17	0.035
pop	-1.06E-08	7.60E-09	-1.39	0.163	-1.06E-08	1.27E-08	-0.83	0.409
popchcc	0.49613	0.1251593	3.96	0	0.49613	0.2444116	2.03	0.048
sub	-0.00091	0.0003195	-2.84	0.004	-0.00091	0.0004685	-1.94	0.058
spndtax	-0.25612	0.0642095	-3.99	0	-0.25612	0.0831155	-3.08	0.003
unemp	-0.05083	0.0160621	-3.16	0.002	-0.05083	0.0273638	-1.86	0.069
yr93	0.055901	0.0634032	0.88	0.378	0.055901	0.1079726	0.52	0.607
_cons	10.61373	0.30114	35.25	0	10.61373	0.5029692	21.1	0

* City Effects omitted from table

White	
# of Obs.	8662
F(72, 8589)	96.85
Prob > F	0
R-squared	0.4039
Root MSE	0.641

Clustered	
# of Obs.	8662
F(22, 49)	.
Prob > F	.
R-squared	0.4039
Root MSE	0.641