

Determinants of Franchise Values in North American Professional Sports Leagues: Evidence
from a Hedonic Price Model

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Abstract

Professional sports teams in North America are privately held corporations. Consequently, they are not required to make audited financial statements publicly available. We use a hedonic price model to analyze transaction prices for professional sports teams from 1969 to 2006. Results indicate that franchise age, facility ownership, number of local competitors, and metropolitan population all have significant hedonic prices. A quality-adjusted price index based on these results indicates the average annual increase in prices over the period exceeded 15%. Long-term sports team owners have experienced significant capital appreciation over the past 40 years, an outcome inconsistent with operating losses.

Introduction

There has been a recent increase in scholarly research on the determinants of professional sports franchise values. This research is limited by the fact the fundamentals used to value typical businesses are not readily available for North American professional sports teams, which are privately held corporations and do not release audited financial data to the general public. In addition, a distinguishing characteristic differentiating sport franchises from traditional businesses is their dependence on intangible assets. These intangible assets, including player contracts, television rights, stadium agreements, and relationships with fans are important factors contributing to the overall financial status of professional sports teams. While intangible assets are present within traditional businesses, tangible assets such as plant, property, and equipment are generally considered the drivers of valuation.

Despite anecdotal evidence primarily filtered through the mass media reporting imminent bankruptcies and claims of individual team owners losing significant dollars, few professional sports teams in North America have been forced into bankruptcy, and only a few empirical studies examining the determinants of franchise valuation exist. This study adds to the existing research by identifying some factors associated with franchise valuation.

In one of the first empirical studies of professional sport team values, Alexander and Kern (2004) examined the effects of team classification, relocation, and the impact of a new stadium on franchise values in the National Football League (NFL), National Basketball Association (NBA), National Hockey League (NHL), and Major League Baseball (MLB). Variables including market size, team performance, and the presence of new stadiums were all found to increase a team's franchise value. Furthermore, playing in a new stadium increased MLB team values an average of \$17 million, however NBA team values only increased by \$6.6

million. In addition to the impact of a new stadium, teams using a regional identifier, for example the Tampa Bay Devil Rays (a team identified with a single city) as compared to the Florida Marlins (a team identified with a larger region, the entire state of Florida) had increased franchise values in MLB but not in the other three leagues. Alexander and Kern (2004) posited this finding may be attributed to the fact other leagues have institutional policies, like revenue sharing, in place minimizing any differences among the teams.

Vine (2004) compared actual transactions sales for NBA, NFL, NHL, and MLB teams from 1999-2003 relative to data provided by *Forbes* to estimate if professional sport franchises sold for discounts or premiums. In this study, franchises sold at a 27% premium relative to the *Forbes* figures. Vine suggested this premium was perhaps due to an owners' "ego factor". This ego factor was derived from the utility a professional sports franchise owner experiences compared to other industry executives. However, while determining the actual validity of the ego factor has been difficult to assess quantitatively, the public enthusiasm demonstrated by visible owners such as Mark Cuban and George Steinbrenner support this hypothesis.

Fort (2006) examined the value of MLB franchise growth rates and found throughout the league's history the average real growth rate of team prices has been twice the usual 3% comparison value for the entire economy. However, as noted by the author this study failed to address some obvious and important issues. Specifically, additional time-series analyses could potentially provide some explanatory power as to why there were such tumultuous swings in sales price growth rates.

Finally, Miller (2007) analyzed MLB panel data from 1990-2002 and found teams playing in new stadiums demonstrated an increase in franchise value after controlling for team quality and city demographic differences. Furthermore, Miller (2007) found that teams playing in

private stadiums had higher franchise values compared to teams playing in public stadiums, although this difference was insufficient to cover the average construction cost of the stadium.

Although audited financial information is unavailable, sale prices of sports teams are typically made public when teams are sold. Furthermore, *Forbes* magazine publishes an annual estimate of the value of all franchises in the four major professional team sports in North America. Prior to the *Forbes* estimates, *Financial World* magazine published annual estimates of franchise values beginning in 1990. In this paper, we examine the fundamental determinants of franchise sale prices. Although a large number of anecdotal sources have addressed this phenomenon, only a few empirical papers have examined franchise valuation thus far. Fort (2006) found relatively high variation in the appreciation of franchise values over time, but did not examine the relationship between fundamentals and sale prices. Similarly, Alexander and Kern (2004) reported that market size, on-field performance, and new facilities were associated with higher franchise values over the period 1991-1997.

Method

Several empirical approaches for analyzing changes in the prices of fixed assets like houses and real estate exist. These methods have been used to analyze changes in the prices of assets like art (Beggs & Graddy, 2006; Goetzmann, 1993), wine (Burton & Jacobsen, 2001), and antique furniture (Graesner, 1993). We apply one of these techniques, hedonic price index method (HPI), to the analysis of the prices paid for professional sports franchises.

The hedonic price framework was first proposed by Rosen (1974). The hedonic method uses variation in observable characteristics of an asset, in this case a professional sports franchise, to explain observed variation in the sale price of that asset. The parameters on the

variables capturing the characteristics can be interpreted as hedonic prices of those characteristics. The general form of a hedonic model is:

$$\ln(P_{it}) = \alpha_t C_t + \beta_t S_{it} + \varepsilon_{it} \quad (1)$$

where S_{it} is a vector of characteristics of sports franchise i in period t , C_t is a time-varying intercept term capturing systematic market variation in the sports franchise market in each period, and ε_{it} is a mean zero, constant variance equation error term capturing all unobservable random variation in franchise prices. β_t is an unobservable vector of hedonic prices to be estimated and α_t is a vector of time-varying intercept parameters to be estimated. There are several ways to construct price indexes holding quality constant using a hedonic model like equation (1). Given sufficient data, the equation could be estimated separately for each period in the sample, and a price index constructed from the fitted values. This method may lead to a considerable loss in efficiency if the number of observations in each period is small relative to the total sample size. Alternatively, if the estimated hedonic prices are equal in each period, the estimated parameters on the time-varying intercept terms can be used to construct a price index. This approach does not lead to efficiency losses. However, if the hedonic prices are not equal in each period, the index based on the time-varying intercepts will be biased.

Data

The basic data source on franchise sale prices and data on annual estimates of franchise values and team revenues and costs is Rod Fort's Sports Business Data website (<http://www.rodneymfort.com/PHSportsEcon/Common/OtherData/DataDirectory.html>). Fort collected franchise-specific data from primary news sites like *USAToday*, *Financial World* and *Forbes* magazines, and other print sources. This web site contains franchise sales price data for

all four of the major North American professional sports leagues; the NBA, NFL, NHL, and MLB, back to the early part of the 20th century.

We analyze franchise sale prices over the period 1969-2006. Note that we are not using the estimated franchise values reported annually in *Forbes* magazine; we restrict our analysis to only reported franchise sales prices. We restrict our sample to the post-1969 period because no annual metropolitan area economic data exist before this year, and market characteristics may affect franchise sales prices. Many franchise sales are fractional – an individual or group of investors buys a portion of a professional sports franchise. Following the method used by Fort (2006), we converted all fractional sales to full value. So if 50% of a franchise was sold for \$10 million dollars, we count the estimated franchise value as \$20 million dollars.

Other data on sports franchises and facilities were collected from www.ballparks.com and from web pages for the individual leagues. Data on the population of the metropolitan area that each team plays in come from the U.S. Bureau of Economic Analysis' Regional Economic Accounts (<http://www.bea.gov/bea/regional/reis/>) and Statistics Canada (<http://www.statcan.ca/>). Collectively, there were 173 sales of existing franchises during the sample period across these four leagues. Specific to these 173 sales, 63 occurred in MLB, 51 in the NBA, 35 in the NFL, and 35 in the NHL.

Table 1: Nominal Sale Prices 1969-2006

Sport	# Sales	Average Franchise Sale Price in Millions of Dollars	Std. Dev.	Min	Max
MLB	63	132.4	154.6	7.1	700
NBA	51	176.2	336.1	2.0	2125
NFL	35	186.6	336.1	10.0	1000
NHL	35	85.9	76.8	3.8	250

Table 1 contains summary statistics on the franchise sales over the sample period, in current dollar or nominal terms. Research on the sale price of houses, art, and other assets typically works with nominal prices rather than real prices to avoid bias introduced by the deflation process and to make the results comparable to the nominal rate of return on other traded assets like stocks and bonds. We follow this convention in this paper.

The NFL franchises possessed the largest mean sale price and NHL franchises the smallest. Moreover, NBA franchise sale prices were more volatile than other leagues, while NHL franchise sale prices the least variable. The largest price paid for a sports franchise in the sample was \$2.125 billion paid for the New York Knicks in 1997. While this transaction would appear as an outlier, additional examination revealed this transaction also included their home facility Madison Square Garden, a 19,763 seat arena in midtown Manhattan that is the largest revenue generating sports venue in the world. . . Likewise, the largest price paid for an NFL franchise was \$1.0 billion paid for the Washington Redskins in 2003 and that transaction included the 80,000-seat stadium in which the Redskins played, named FedEx Field. The largest price paid for a MLB franchise was \$700 million paid for the Boston Red Sox in 2002, including Fenway Park and an 80% ownership interest in a regional sports television network, the New England Sports Network. Lastly, the largest price paid for an NHL franchise was \$250 million paid for the Philadelphia Flyers in 1996. Undoubtedly, ownership of a stadium or arena had a significant effect on the sale price.

The franchise sales were evenly distributed over the sample period. For example, 65 transactions occurred between 1969 and 1979; 54 took place in the 1980s, 57 in the 1990s, and 35 since 2000. Only 3.3% of the sales involved a move of the franchise from one city to another and 18.5% of the transactions involved both a team and a sports facility. Seven percent of the

transactions (15 in total) involved franchises located in Canada. These transaction prices were converted the U.S. dollars at the exchange rate at the time of the transaction.

Our final data set consisted of 184 franchise sale prices from the four major professional sports leagues in North America over the period 1969-2006. We augmented these data with additional variables capturing the ownership of the facility the team played in, the success of the team on the field, the age of the franchise and facility, and market characteristics like metropolitan area population and the number of other professional sports franchises in the metropolitan area. Note that NHL standings are based on points, not wins, so NHL team performance, unlike NFL, NBA and MLB performance, is not based on winning percentage. For the NHL, we estimated winning percentage by dividing the number of points earned in each season by 162, the maximum number of points possible in an 81 game season. This transformation makes NHL on-ice success comparable to the other three leagues while still preserving the relative within-season and across-season relative standings of NHL teams.

Results

The parameters of equation (1) were estimated using Ordinary Least Squares and the White-Huber “sandwich” correction for heteroscedasticity. Given the wide variation in the franchise sale prices on Table 1, the variance of the error term in equation (1) may not be constant. We used a separate intercept term for teams in each league, with Major League Baseball as the omitted category. This allows for the average franchise price in each league to vary. Our hedonic regression model clearly explains a great deal of the observed variation in franchise sales prices, suggesting we collected a reasonable set of covariates. We also included a vector of time dummy variables to capture yearly unobservable effects in franchise sale prices. The

parameter estimates on these variables can be used to create a quality-adjusted price index for sports franchises. This procedure will be discussed in detail below. Table 2 shows the parameter estimates, which can be interpreted as hedonic prices, t statistics, and other information from this estimation. The results on Table 2 omit the 1997 sale of 40% of the New York Knicks for \$850 million, as this transaction is clearly an outlier.

Table 2: Hedonic Price Estimates From Equation (1)

Variable	Parameter	t-Statistic
NBA	0.003	0.03
NFL	0.727	5.78
NHL	-0.321	-2.45
Log(MSA Population)	0.669	8.29
Team Owns Stadium	0.287	2.10
Franchise Age	0.004	2.02
Competing Teams in Market	-0.068	-4.06
Team win % last 5 years	-0.110	-0.36
Facility Age	-0.002	-0.56
N/R ²	172	0.99

The parameter estimates on the sport-specific dummy variables indicate that, holding other factors constant, the average price of NFL franchises is higher than the average price of MLB franchises, the average price of NBA franchises is equal to the average price of an MLB franchise and the average price of an NHL franchise is lower than a MLB franchise. NFL franchises are the most expensive and NHL franchises are the least expensive.

Franchises in larger markets command a premium, probably because of the larger revenue potential. The parameter on the log of the metropolitan area population can be interpreted as an elasticity in this setting, and the parameter estimate suggests for each additional

1% increase in the metropolitan area population the franchise sale price increases by 0.67%. Both Alexander and Kern (2004) and Miller (2007) found metropolitan population to have a positive effect on franchise values. Teams owning their facility also command a premium and the franchise age also carries a positive hedonic price. Team buyers are effectively buying the history of the team, and the longer the team has been in existence, the more team history there is to buy. The age of the facility the team plays in has no effect on franchise sale prices and recent on-field success, as measured by the average winning percentage in the five seasons before the sale, also had no effect on sale prices. These three results differ from Miller's (2007) findings, who found that: a) franchise age had no effect on franchise value, b) facility age had a negative effect on franchise value, and c) current and lagged winning percentage had a positive effect on franchise value. Miller (2007) analyzed annual franchise value estimates from MLB while we analyze transaction prices across all four major leagues. Both Fort (2006) and Miller (2007) remarked that the franchise value estimates typically differ from actual sale prices. Since 1990, when the *Forbes/Financial World* franchise value estimates were first published, there were 89 franchise sales in the four North American professional sports leagues studied here. On average, the estimated franchise value was \$31.6 million less than the actual sale price for these franchises. This average difference obscures some asymmetry in the difference; for 57 of the sales, the estimated franchise value was less than the sale price, with an average difference of \$75 million; for 30 of the sales, the estimated franchise value was greater than the sale price, with an average difference of \$49 million; in two instances, the 1991 sale of the New York Giants and the 2001 sale of the Seattle SuperSonics, the sale price and the estimated franchise value were identical.

These differences in parameter estimates help identify why the *Forbes* franchise estimates differ from actual sale prices. Based on Miller's (2007) results, the annual franchise value estimates depend more on facility and on-field success, while the sale prices depend more on franchise and market characteristics. Our results suggest that facility age and on-field success have no effect on sale price. Miller's (2007) analysis of estimated franchise values suggests that on-field success and facility age systematically affect estimated franchise values. Thus one reason for the systematic difference between the estimated franchise values and actual franchise sales price is because the estimated franchise values take into account on-field success and facility age while franchise buyers do not.

Note that we also estimated equation (1) using current and one season lags of winning percentages. None of these variables were significantly different from zero in the hedonic model. We also added a variable reflecting the number of past championships won by the team to the hedonic model; the estimated parameter on this variable was also not statistically different from zero. It appears team success does not have an important hedonic price in this setting.

The number of competing professional sports teams in the metropolitan area, the lower the franchise sale price, other things equal. This result is consistent with the idea that other professional teams in the metropolitan area are competitors, and the presence of more competitors reduces the franchise sale price, holding other market characteristics like metropolitan population constant.

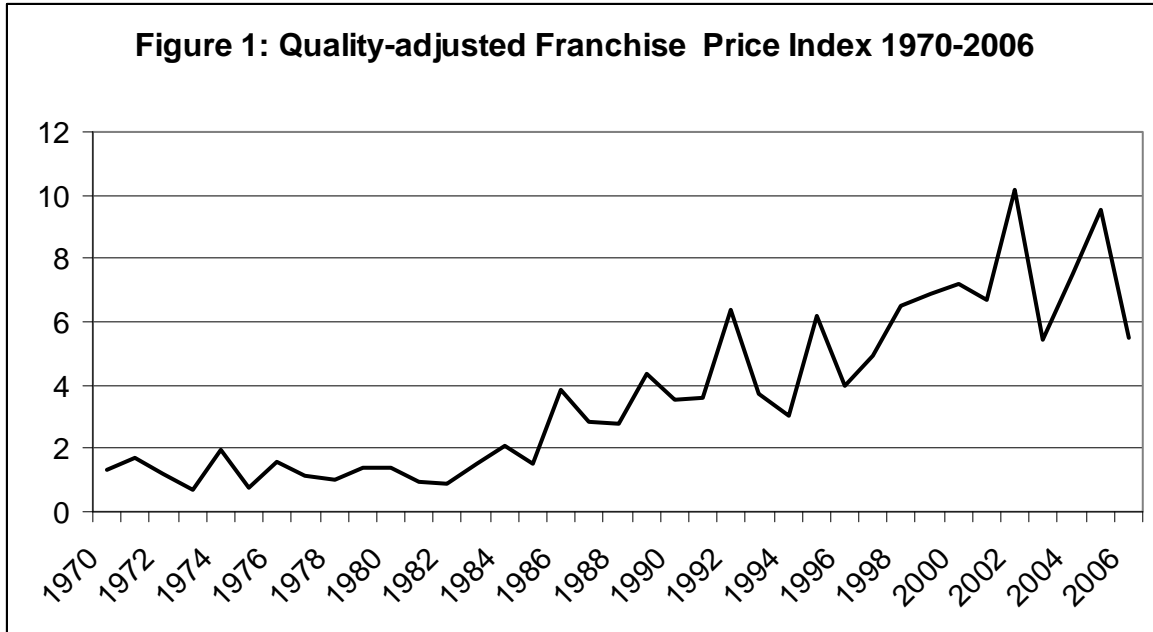
Recall that the dependent variable in this regression is the log of the nominal franchise sale price. We use nominal prices so that we can construct a nominal quality-adjusted price index, and to avoid bias introduced by deflation. Replacing the log of the nominal sale price with the log of the real sale price, where the sale price is deflated using the annual average CPI,

had no effect on the results, except that the estimated parameter on the variable for the number of competing franchises in the metropolitan area is negative and significant at the 1% level in the alternative model specification.

The estimates from a hedonic price model can be used to construct a quality-adjusted price index for the good being analyzed. Berndt (1991) provides a detailed description of this process. The hedonic method has both advantages and disadvantages for constructing a quality-adjusted price index. Hedonic indexes can be based on all observed transactions during a given period, leading to larger sample sizes and increased efficiency in settings like professional sports. However, the hedonic method relies significantly on identifying a set of explanatory variables capturing the relevant qualities of the assets being bought and sold. The hedonic method also makes demands on the specification of the empirical model, including functional form and parameter stability over time. In order for a quality-adjusted price index to be constructed from the year dummy variables in a hedonic price model, the parameters on the other explanatory variables must be constant over the sample period. Chow tests indicated the parameter estimates from equation (1) were stable over the sample period

Given a set of estimated hedonic prices that are constant over the sample period, and a model capturing relevant qualities of franchise values, a quality adjusted price index can be calculated based on the estimated time-varying intercepts, the estimates of the α_t s, from equation (1). This amounts to calculating $e^{\alpha t}$ for each of the estimated parameters on the year dummy variables in equation (1). This price index shows how the purchase price of an “average” professional sports franchise has changed over the sample period, holding constant all the quality factors on the left hand side of equation (1). These factors include the specific league of each

team, local market size, franchise and facility age, the number of competitors in the local market, and the on-field success of the team.



The hedonic price index based on the results from Table 2 is shown in Figure 1. The vertical scale on Figure 1 is an index number, normalized to equal 1 in 1969. There are several interesting features on this figure. First, the quality-adjusted price index has increased steadily over the sample period. Despite some short-term downturns in franchise prices, the quality-adjusted price of an average sports franchise has increased steadily over the past 38 years. It is difficult to reconcile this increase with the periodic claims of large and persistent losses incurred by team owners. If professional sports teams consistently lose money, why does the quality-adjusted price index continue to increase?

Second, based on Figure 1, it is difficult to incur a capital loss on the purchase of a professional sports franchise. The average annual increase in the quality-adjusted franchise price was 16% over the sample period, a nominal rate of return far exceeding the annual 3% per year rate of return used by Fort (2006) as a comparison. Based on this price index, a generic sports

franchise bought for \$5 million in 1970 and held for 35 years would have been worth \$48 million in 2005, holding quality constant over the period. However, the quality-adjusted price index on Figure 1 does exhibit quite a bit of variation, and there are several years with a negative rate of return on the average franchise value.

The average rate of increase also varies considerably by decade. The average annual increase was 21% from 1969-1979, 23% in the 1980s, 13% in the 1990s, and just 4% after 2000. It is useful to compare these numbers with the decade-by-decade unconditional results in Fort (2006) for MLB. Fort reports a 5.3% increase for the 1970s, 9.5% for the 1980s, and 3% for the 1990s, based on unconditional repeat sales for specific MLB franchises. Fort's decade-by-decade annual growth rates are lower because he focuses on a single sport and his increases do not hold franchise quality constant over the period. These results suggest that a buy-and-hold team owner could expect a much larger annual rate of return in an investment in a sports franchise than Fort's (2006) results.

The lower annual increase in the quality-adjusted price index after 1990 suggests there may have been an important change in the market for sports franchises in the latter part of the sample period. Fort (2006) also noted the decline in the value of ownership of professional sports teams in the past 10 years, asking of MLB "why did the fall off to essentially zero growth rates in the 1990s occur?" Although we have no evidence to point to in this paper, we can rule out a decline in the quality of sports franchises in the past 20 years as the culprit, since the decline is also present in our quality-adjusted price index.

Summary and Conclusions

In this paper we analyze the evolution of the sales price for professional sports franchises in North America using a hedonic price model. This approach has been used to investigate changes in the price of other assets like residential real estate, art, and wine. The hedonic price method allows us to identify certain characteristics of sports franchises affecting their sale price and estimate a hedonic price for each of these characteristics. Our results suggest the nature of the league, local market size, franchise age, the number of competing professional teams in the market, and the ownership of the facility the team plays in all have significant hedonic prices, while the team's on-field success and facility age do not. We construct a quality-adjusted price index for an average professional sports franchise. The average annual rate of increase of this index is over 20% over the period 1969-2006, signifying owners of professional sports teams earned significant capital gains over the period. This estimated increase in franchise prices is also significantly larger than previously reported in the literature, suggesting sports team owners have financially benefited even better than previously thought over the past 38 years.

The results in this paper have several important limitations. First, and foremost, the results of the hedonic model estimation depend critically on a properly specified model. If we have failed to include important indicators of franchise quality in the empirical model, then the quality-adjusted price index will be biased, and may not reflect the actual benefit from owning a professional sports team. Also, we have pooled team sales prices across leagues in order to increase the efficiency of our estimates of the parameters of the hedonic model. If there are important differences in the changes in franchise values across leagues that are not captured by our league-varying intercepts, then our results will be affected. Unfortunately, our sample

contains only about 25 observations for some individual sports, making specification tests by sport difficult.

Our results also suggest some potential areas for further research. The franchise sales data analyzed here can also be analyzed using other techniques. Foremost among these is the repeat sales method developed by Case and Schiller (1989). This method has the advantage of placing much less emphasis on model specification. Also, the decline in the annual increase in the quality-adjusted franchise price index beginning in the 1990s deserves more attention. Researchers with access to additional franchise sale data from the 2000s should further investigate the nature and causes of this change. Specifically, additional research could accurately determine if this reduction in franchise appreciation represents a permanent trend or if this was just a transitory period in team ownership values.

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