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Franchise Values in North American Professional Sports Leagues: Evidence from a Repeat Sales Method

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Abstract

The paper develops a quality adjusted professional sports franchise price index for North America based on a repeat sale method. This index reflects trends in the general price of sports franchises holding local market, facility, and team characteristics constant. The price index exhibits considerable volatility but no upward trend over time, unlike previous quality adjusted price indexes based on hedonic models in the literature. The lack of an upward trend in this quality adjusted price index indicates that specific franchise characteristics drives observed increases in prices over the past forty years.

JEL Classification Codes: G12, L83

Keywords: repeat sales method, sports franchise, quality adjusted price index

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Introduction

Accurate measurement of the value of professional sport franchises is important to our understanding of the operation of sports leagues. Fort (2006) pointed out two important features of sport franchise values: First, the lack of audited financial data from professional sports teams in North America, coupled with incessant, hard to verify, claims of financial difficulties made by team owners places a premium on the analysis of observable data like actual prices paid for professional sports teams on the open market; second, franchise values increased dramatically over the past 100 years, outstripping the growth rate of the overall economy by a wide margin, and understanding why franchise values grew so rapidly is an important research question in sport finance. Even if the underlying flows of revenues cannot be observed, finance theory indicates that the price paid for an asset that generates a stream of revenues over time should reflect the present discounted value of the underlying flow of net revenues. Claims of losses often play an important role in team owner's requests for public subsidies for facility construction and operation, further heightening the importance of accurate measurement of franchise valuation.

Previous research on the value of sports franchises in North America used two approaches: unconditional analysis of transaction prices and hedonic models applied to franchise values. The unconditional analysis of franchise sale prices and estimates of franchise values focuses on describing changes in these values over time. The hedonic approach has been widely used to analyze the factors affecting the value of a number of assets including houses, art (Goetzman 1993; Beggs and Gaddy, 2006), vintage wine (Burton and Jacobsen, 2001), and antique furniture (Graesner, 1993), in addition to sports franchises. The hedonic method provides a theoretical grounding for the analysis of franchise prices, controls for changes in the

quality of the franchise, and generates estimates of the hedonic price of observable characteristics of franchises that provide important information about the factors that drive changes in franchise values. In this paper, we use an alternative approach, the repeat sales method, to analyze actual franchise sale prices over the period 1960-2009 in the National Football League (NFL), National Basketball Association (NBA), National Hockey League (NHL), and Major League Baseball (MLB). We find that the quality adjusted price index, which reflects the price of a “standardized” or generic sports franchise has not increased much over the past forty years in North America. Extending this repeat sales method to a hybrid model that includes all transactions in the sample period has no effect on the index.

This paper extends a growing literature on the determinants of professional sports franchise values. Fort (2006) performed an unconditional analysis of both actual franchise sale prices and annual estimates of franchise values published in *Financial World* and *Forbes* magazines over the past few decades. Fort (2006) concluded that owning a professional sports team in North America was a profitable experience over the past hundred years, since the average increase in franchise sale prices exceeded the growth rate of the aggregate economy over the same period.

The hedonic approach uses a model relating estimated franchise values to observable characteristics of the teams and the markets they play in to explain observed variation in the franchise value. Alexander and Kern (2004) estimated a hedonic model that included income in the local market, population of the local market, team success as measured by finish in the previous season’s final standings, an indicator for teams with a regional orientation, an indicator variable for teams that relocated from another location, and an indicator variable for the presence of a new stadium as observable characteristics using data on annual estimated franchise values in

the National Football League (NFL), National Basketball Association (NBA), National Hockey League (NHL), and Major League Baseball (MLB). Income and population in the local market had positive hedonic prices, as did higher finishes in the final standings and new facilities.

Miller (2007) estimated a hedonic model using panel data from MLB over the period 1990-2002. Hedonic characteristics included market income and population, current and lagged winning percentage, an indicator variable for privately owned stadiums, the age of the team's facility, the age of the team and the team's tenure in its current home. Market population, but not market income, current and past success, and playing in private stadiums all had positive hedonic prices; stadium age had a negative hedonic price, suggesting a reason why teams frequently seek public subsidies for new stadium construction projects. Miller (2009) estimated a hedonic franchise value model using panel data from the NFL, NB and NHL over the period 1991-2004. This paper used the same set of hedonic characteristics as in Miller (2007). Market income, but not population, lagged success, but not current success, and playing in a privately owned facility had positive hedonic prices; facility age had a negative hedonic price.

Although Alexander and Kern (2004), Miller (2007) and Miller (2009) do not examine increases in franchise values, these papers identify a set of observable franchise characteristics that affect estimated franchise values, providing important information for understanding increases in franchise values over time. These three studies used estimated franchise values developed by *Financial World* and *Forbes* magazines instead of transaction prices. Fort (2006) observed that the estimated franchise values were often quite different from actual sales prices, so the hedonic prices estimated in these three studies could reflect problems estimating the value of sports franchises and not actual changes in the actual value of the underlying asset, a professional sports team. Humphreys and Mondello (2008) estimated a hedonic franchise value

model using transactions panel data from the NFL, NBA, MLB and NHL over the period 1969-2006. Hedonic characteristics included market population, franchise and facility age, an indicator variable for private facility ownership, success over the past five years and the number of competing professional sports teams in the local market. Population, franchise age, and private ownership of the facility had positive hedonic prices; competing professional teams in the local market had a negative hedonic price. Humphreys and Mondello (2008) constructed a quality adjusted franchise price index from the empirical results; this index showed a clear upward trend beginning in the early 1980s, indicating that changes in observable factors related to franchise value were not driving observed increases in franchise values over the past three decades and confirming Fort's (2006) finding of significant returns to professional sports team ownership. Differences in estimated hedonic prices in this study can be attributed to the use of actual transaction prices instead of estimated annual franchise values.

All of the conditional analyses discussed above use a similar empirical approach that can be interpreted in terms of a standard hedonic model: explain the observed variation in franchise values or transaction prices using observed variation in observable characteristics of the franchises, the markets they play in, and the facilities they play in. Hedonic models have a number of well-documented limitations in this setting (Meese and Wallace, 1997). First, theory provides no guidance on the functional form of the hedonic model, leading to the possibility of specification bias affecting the results. Miller (2007) and Miller (2009) demonstrates that the estimated hedonic prices on private ownership and facility age exhibits sensitivity to model specification, suggesting that the specification of the hedonic model may be important in this setting. Second, the ability of the hedonic model to explain variation in franchise values depends on the availability of observable variables that capture the quality of the franchise. Professional

sports teams generate many unobservable, and intangible benefits, including the public goods effects like the generation of “world class city” status on the host community, a sense of community and commonality among fans and other residents of the host city (Johnson and Whitehead, 2000), and other difficult to quantify factors related to the perceived quality of the franchise related to reputation. In the hedonic models discussed above, these unobservable team-specific quality attributes are captured by team-specific intercept terms.

The Repeat Sales Method

The repeat sales method represents an alternative approach to hedonic models for analyzing changes in sports franchise values. Repeat sales methods use the change in franchise sales prices from one sale to the next to account for the hedonic characteristics of franchise prices. The use of changes in sales prices removes the effect of unobservable time-invariant hedonic characteristics; it also avoids any econometric problems associated with specification of the hedonic model and lack of data capturing hedonic characteristics. Following the approach in the real estate literature, we assume that a North American market for professional sports franchises exists, and that the sale price of a sports franchise in this market arises from a stochastic process where the average rate of change, sometimes called the price drift in this literature, can be represented by a market index and the dispersion of franchise values around this average market rate of change in a log diffusion process. Let P_{it} be the price paid for sports franchise i in year t . Given these assumptions, the log of franchise prices can be expressed

$$\ln(P_{it}) = \beta_t + H_{it} + N_{it} \quad (1)$$

where β_t is a market franchise price index, H_{it} is a Gaussian random walk term, and N_{it} is a mean zero, constant variance random variable, so that $N_{it} \sim (0, \sigma_n^2)$. The Gaussian random walk term captures variation in individual franchise value growth rates around the market growth rate. The

mean zero random variable captures cross-sectional variation in franchise values due to completely idiosyncratic differences in franchises at each point in time during the sample. These factors are assumed to be uncorrelated over time. If franchise prices evolve in this way, then the total percentage change in price for a given franchise i that is purchased at time s and again at time t can be expressed as

$$\begin{aligned}\Delta V_{it} &= \ln(P_{it}) - \ln(P_{is}) \\ &= \beta_t - \beta_s + H_{it} - H_{is} + N_{it} - N_{is}\end{aligned}\quad (2)$$

The properties of this stochastic process are

$$\begin{aligned}E[H_{it} - H_{is}] &= 0 \\ E[(H_{it} - H_{is})^2] &= A_{t-s} + B^2_{t-s} \\ E[N_{it}] &= 0 \\ E[H_{it}N_{js}] &= 0 \\ E[N^2_{it}] &= C\end{aligned}$$

where A , B , and C are parameters defining the variance of the stochastic process over time. Note that the second equation incorporates the assumption that the variance of this stochastic process increases at an increasing rate as time between sales increases. Given a sample of repeat sales of sports franchises over time, the difference in the natural log of the franchise values of franchise i that is sold multiple times in the sample period can be expressed

$$\Delta V_i = \sum \ln(P_{i\tau}) D_{i\tau}\quad (3)$$

Where $D_{i\tau}$ is an indicator variable equal to 1 if period τ is the time of the second observed sale, equal to -1 if period τ is the time of the first observed sale, and equal to zero in other periods.

Using equation (1), equation (3) can be expressed

$$\Delta V_i = \sum \beta_\tau D_{i\tau} + \varepsilon_i\quad (4)$$

Where the β_t 's are unknown parameters to be estimated. The estimated β_t 's can be used to calculate an index number for sports franchise values holding quality constant. The index can be calculated by

$$I_t = 100e^{\beta t} \quad (5)$$

Note if the variance parameters A and B are not equal to zero, Case and Shiller (1989) showed the variance of the equation error term in (4) is heteroscedastic and proposed a feasible Generalized Least Squares (GLS) estimator to correct for this problem. The GLS estimator is based on the fact sports franchise i that is sold in periods s and t in the sample has a predicted sale value of

$$\ln(\hat{P}_{it}) = \ln(P_{is}) + (\hat{\beta}_t - \hat{\beta}_s).$$

Consequently, the predicted price is the actual price marked up by the expected market appreciation. Based on the assumed functional form of the variance structure described above, the deviation of the actual franchise price from its expected value is

$$\begin{aligned} d_t^2 &= [\ln(P_{it}) - \ln(P_{is}) - (\hat{\beta}_t - \hat{\beta}_s)]^2 \\ E[d_t^2] &= A_{t-s} + B_{t-s}^2 + 2C \end{aligned}$$

And A, B, and C can be estimated using the residuals of (4) as the dependent variable from the above equation. The fitted values from this can be used to transform the original observations of ΔV_i and correct for heteroscedasticity.

Data Description

The data source on franchise sale prices is Rod Fort's Sports Business Data website (<http://www.rodneymfort.com/PHSportsEcon/Common/OtherData/DataDirectory.html>). This website 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 1960-2009. We restricted our sample to the post 1960 period because the quality of franchises must remain constant for the repeat sales method to work and the longer the time period analyzed the less likely is this assumption to hold. Many of the 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. For example, if 50% of a franchise was sold for \$10 million dollars, we estimate the total franchise value at \$20 million dollars.

The data set contains observations for all franchise sales in the four major North American professional sports leagues over the period 1960-2009. There were 275 individual franchise sales during the sample period in these four leagues; 80 occurred in MLB, 77 in the NBA, 56 in the NFL, and 62 in the NHL.

Table1: Franchise Sales Prices 1960-2009

| Sport | #Sales | Mean Nominal Price | St. Dev. | Min | Max |
|--------------|---------------|---------------------------|-----------------|------------|------------|
| MLB | 80 | 124.37 | 168.99 | 4.5 | 889.5 |
| NBA | 77 | 159.93 | 322.67 | 2.0 | 2125.0 |
| NFL | 56 | 212.29 | 296.83 | 1.4 | 1222.2 |
| NHL | 62 | 85.39 | 97.83 | 2.0 | 575.0 |

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 real estate, art, and other assets uses nominal prices rather than real prices to avoid bias introduced by deflation; this also makes the results comparable to the nominal rate of return on other assets like stocks and bonds. We follow this convention in this paper. From Table 1, NFL franchises had the largest average sale price and NHL franchises the smallest. NBA sale prices were more volatile than other leagues and NHL sale prices were the least variable. The largest price paid for a sports franchise in the sample was \$2.125 billion dollars paid for the New York Knicks in 1997. While this transaction

would appear as an outlier initially, closer examination revealed this transaction also included Madison Square Garden, and extremely valuable piece of real estate in midtown Manhattan. The largest price paid for an NFL franchise was \$1.2 billion dollars paid for the Miami Dolphins in 2009. That transaction included Dolphins Stadium. The largest price paid for a MLB franchise was \$889.5 million paid for the Chicago Cubs in 2009. That transaction included Wrigley Field. The largest price paid for an NHL franchise was \$575 million paid for the Montreal Canadiens in 2009. That transaction included the Bell Centre. Ownership of the team's stadium or arena had a significant effect on the sale price, consistent with the results in Miller (2007, 2009).

Implementing the Case-Shiller estimator requires repeated observations on the sale of the underlying asset. In this case, we need observations on repeated sales of the same sports franchises in order to estimate a quality-adjusted sport franchise appreciation. Fortunately, the 1960-2006 time period contains a number of repeat sales of sports franchises. Of the 275 franchise sales occurring from 1960 to 2009, 139 were repeat sales of a sports team, although none of these repeat sales took place until 1967. These repeat sales involved about 50 teams and among the franchises with multiple sales, the average number of transactions was 3. Most of the repeat sales involved only two transactions, however the Boston Celtics were bought and sold six times during this period and the Philadelphia Eagles and Minnesota Vikings were bought and sold five times. There is at least one transaction in every year in the sample except 1971, 1976, 1979, and 1987.

Table 2: Repeat Sales 1967-2009

| Sport | #Repeat Sales | % Change | Std. Dev. | Min | Max |
|--------------|----------------------|-----------------|------------------|------------|------------|
| MLB | 50 | 115% | 1.21 | -68% | 409% |
| NBA | 39 | 122% | 1.04 | -41% | 377% |
| NFL | 25 | 104% | 0.87 | -40% | 343% |
| NHL | 25 | 119% | 1.16 | 61% | 331% |

The repeat sales in the sample period are summarized in Table 2. Baseball teams appear most frequently and football teams appear least frequently in this sample of repeat sales. The % change variable is the average value for the variable ΔV_{it} from the previous section; it is the difference in the log of the sale price from period t to period s . This value approximates the percentage change in the sale price calculated by the traditional formula. The average number of years between sales in the sample, $t-s$, was 10 years, with a standard deviation of 7.6. The longest period between transactions was 35 years. Owners of sports teams realized a considerable gain when they sold their team; the average rate of return was well over 100% in all leagues, and the extreme figures confirm several owners realized gains in the neighborhood of 400%.

The negative minimum values reported on Table 2 deserve some explanation, as negative returns to owning a professional sports team would appear unlikely. Only 8 of the transactions in the sample generated a loss and virtually all of those can be explained as anomalous. The largest negative return in the sample, a 68% loss, involved the sale of 80% of the Chicago White Sox to Bill Veeck in the 1970s. The second largest negative return in the sample, a 61% loss, was the sale of the Pittsburgh Penguins in 1975. The franchise was in bankruptcy at the time, for the second time in five years, and had been taken over by the league. The other negative returns on Table 2 represent fractional purchases of additional stakes in teams by the same individual. The -41% return for Baseball comes from the 1973 sale of a 7% stake in the Cleveland Indians by Nick Mileti. Mileti bought the Tribe in 1972 for \$10.8 million and sold a 7% interest in the team the next year for \$500,000. The -40% return in the NBA is from the 1972 sale of the Boston Celtics. Transnational Communications, a holding company owned by shady businessman E. E.

Erdman, bought the Celtics for \$6 million in 1970 and sold the team to Bob Schmertz for \$4 million in 1972.

Results and Discussion

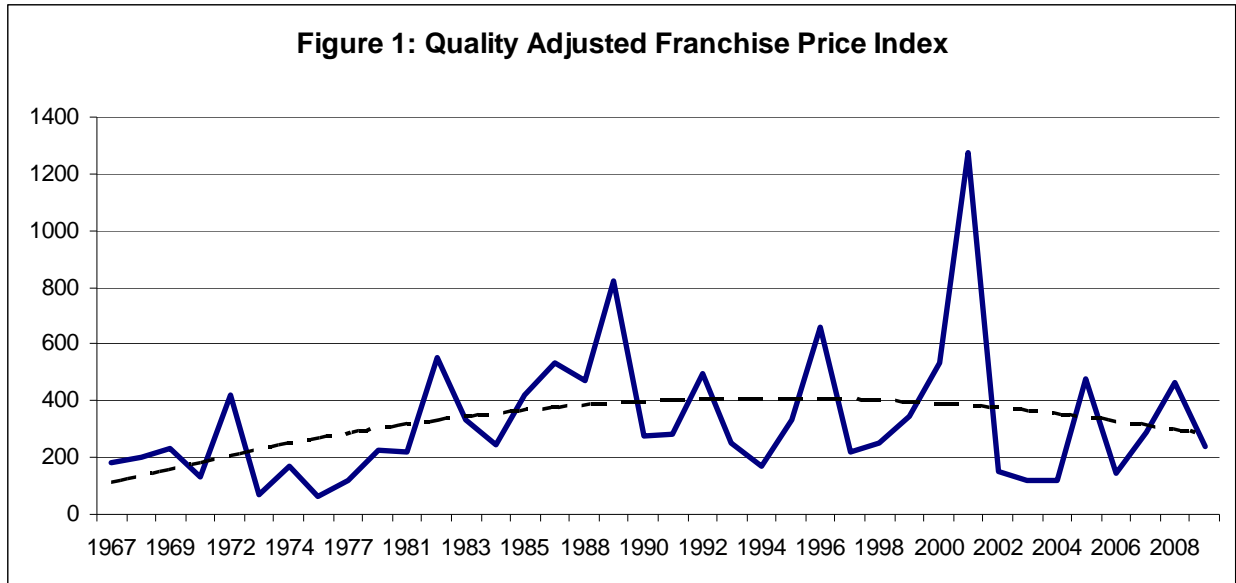
The repeat sales data described in the previous section was used to estimate a quality-adjusted sports team sale price index implementing the Case-Shiller three step estimation procedure outlined by Case and Shiller (1989) and described above. The three step procedure is a feasible Generalized Least Squares (GLS) estimator controlling for quality differences by using only repeat sales data. The first stage involves regressing the log first difference of the franchise sales price on a vector of year dummy variables. The second stage uses the squared residuals from the first stage as the dependent variable and the number of years between sales, and the square of this value, as explanatory variables. The third stage dependent variable is the log first difference of the sale price from the first stage divided by the square root of the fitted value from the second stage in order to correct for heteroscedasticity. The parameter estimates for equation (4) using the 141 repeat sales of professional sports franchises from 1967 to 2009 are shown in Table 3. Most of the parameters are statistically significant at conventional levels and our model explains almost 70% of the observed variation in growth of franchise values from sale to sale.

Table 3: GLS Estimates of Equation (4)

| Year | Coefficient | t-statistic | Year | Coefficient | t-statistic |
|-------------|--------------------|--------------------|-------------|--------------------|--------------------|
| 1967 | 0.600 | 1.16 | 1991 | 1.037 | 2.70 |
| 1968 | 0.693 | 0.95 | 1992 | 1.598 | 3.40 |
| 1969 | 0.854 | 1.19 | 1993 | 0.927 | 2.52 |
| 1970 | 0.289 | 0.56 | 1994 | 0.521 | 1.48 |
| 1972 | 1.432 | 2.67 | 1995 | 1.198 | 3.49 |
| 1973 | -0.372 | -0.71 | 1996 | 1.887 | 3.50 |
| 1974 | 0.532 | 1.03 | 1997 | 0.790 | 1.51 |
| 1975 | -0.437 | -1.04 | 1998 | 0.917 | 3.02 |
| 1977 | 0.183 | 0.24 | 1999 | 1.240 | 4.60 |
| 1980 | 0.817 | 1.57 | 2000 | 1.670 | 4.50 |
| 1981 | 0.791 | 1.58 | 2001 | 2.548 | 3.56 |
| 1982 | 1.705 | 2.32 | 2002 | 0.396 | 1.19 |
| 1983 | 1.204 | 2.89 | 2003 | 0.163 | 0.45 |
| 1984 | 0.904 | 1.88 | 2004 | 0.191 | 0.73 |
| 1985 | 1.438 | 3.62 | 2005 | 1.569 | 3.39 |
| 1986 | 1.671 | 3.84 | 2006 | 0.348 | 1.08 |
| 1988 | 1.553 | 5.55 | 2007 | 1.053 | 1.58 |
| 1989 | 2.104 | 3.39 | 2008 | 1.531 | 2.69 |
| 1990 | 1.021 | 1.67 | 2009 | 0.879 | 1.76 |

N=139 $R^2=0.715$

While these parameter estimates are of some interest, a more important summary statistic for this analysis is a time series plot of the quality-adjusted sports franchise price index that can be calculated from these parameter estimates using equation (5). Figure 1 shows the plot of this index which has been normalized to 1960=100. Because there are relatively few repeat transactions early in the sample period, some of the early index values may not be well identified.



Recall this price index holds the underlying quality of sports franchises, including factors like market characteristics, team reputation, and league characteristics constant. Several interesting features are apparent in Figure 1. The index exhibits quite a bit of variability. The year to year variation in the index can be substantial, involving changes of several hundred points in the index value. This variation can be attributed to the relatively small sample size. The average number of repeat sales transactions in a year in the sample is 0.957. In addition, an extreme value occurs in 2001, where the index value equals 1277. This extreme value contributes to the high year to year variation. Three repeat transactions took place in 2001. The Atlanta Hawks (price \$184 million) were sold for the first time since 1977, the Montreal Canadiens (price \$228 million) were sold for the first time since 1971, and the Seattle SuperSonics (price \$200 million) were sold for the first time since 1984. The franchise prices were not extraordinary relative to other sales in the early 2000s, but these three franchises had not changed hands in decades, so the change in the price was exceptionally large for each transaction. Meese and Wallace (1997) point out the sensitivity of repeat sales and hedonic models to these types of outliers. We view this value as an outlier attributable to coincidental circumstances.

There is clearly no upward trend in the index. The average value of the index over the past four decades is 162.7 in the 1970s, 424.7 in the 1980s, 328.2 in the 1990s and 380.8 in the 2000s. The dashed line on Figure 1 is a quadratic time trend drawn through the sample. This trend line peaks at some point in the early 1990s. The quality-adjusted franchise price index indicates a different pattern in franchise price appreciation than the unconditional analysis by Fort (2006) and the hedonic analysis by Humphreys and Mondello (2008). Humphreys and Mondello (2008) found a steady appreciation in quality adjusted franchise values over time based on a hedonic approach; the repeat-sales approach indicates that quality adjusted franchise values peaked in the late 1980s or early 1990s.

The literature identifies four possible reasons for observed difference between quality adjusted price indexes based on the hedonic and repeat sales approaches:

1. Some important characteristics of each franchise change between transactions, while the repeat sales approach assumes that these characteristics remain unchanged, leading to bias in indexes derived from the repeat sales approach. In this context, the most important characteristic that changes is the age of the franchise and the age of the facility that the franchise plays in. Both increase over time, and the repeat sales approach does not account for this. Case and Quigley (1991) developed a hybrid repeat sales method that accounts for the effects of changes in age-related factors in repeat sales methods. This hybrid method includes age variables in equations (2) and (4). We estimated a hybrid repeat sales model that accounted for both franchise age and facility age. The price index from this hybrid model was nearly identical to the price index shown on Figure 1, suggesting that bias related to age effects is not important in this context. Note that this simple hybrid model could be extended to a hybrid model that includes all

transactions data in the ample period. However, unlike studies of real estate markets that frequently use more complex hybrid models because of the small number of repeat transactions, the number of dropped single transaction observations in this data set is small. The small number of dropped observations suggests that a more complex hybrid model would not produce better estimates of the quality adjusted price index.

2. The price of the hedonic attributes change over time, while the repeat sales approach holds them constant, leading to bias in indexes derived from the repeat sales approach. Previous research suggests that local market population and income, private ownership of the facility and on-field success are the most important observable hedonic characteristics in the market for professional sports franchises in North America. While we cannot rule out the possibility that the hedonic price of these characteristics has changed over time, it seems unlikely that underlying factors that affect the hedonic price of on-field franchise success in professional sports leagues should have changed over time, given the zero sum nature of wins in sports leagues. Similar reasoning applies to the hedonic price of a privately owned facility, given the instability of real estate markets.
3. The franchises that are bought and sold in the sample are not representative of the entire population of franchises, leading to selectivity bias in indexes derived from the repeat sales approach. No formal test exists to determine if the repeat sales analyzed here are representative of the overall sample of franchise sales in North America. But from The repeat sales reported on Table 2 constitute 63% of the total sales reported on Table 1 for MLB, 51% of the total sales in the NBA, 45% of the sales in the NFL and 40% of the sales in the NHL.

4. The hedonic approach mis-specifies the functional form of the model, and omits important hedonic characteristics from the model, leading to bias in indexes derived from the hedonic approach. The hedonic models used in the literature have been basic linear or linear-quadratic functions; no papers have used flexible functional forms. This makes the assessment of specification problems difficult, but leave ample room for mis-specification to be an important problem with indexes derived from hedonic models. There may be a number of franchise characteristics omitted from the hedonic models, including tax benefits associated with owning professional sports teams and the fact that owning a sports team may be more valuable to some agents, like media corporations, than to others.

Of these four possible problems, bias due to mis-specification and omitted variables in hedonic models appears to contribute more to the observed difference between the quality adjusted franchise price index reported by Humphreys and Mondello (2008) and the index reported here. If correct, the implication is clear: the increase in the value of professional sports teams over the past thirty years cannot be attributed to general price increases in this market. The quality adjusted repeat sales index developed here has no upward trend; it appears to have peaked sometime in the late 1980s or early 1990s. The increase in the value of sports franchises appears to be driven by characteristics of the franchises themselves, not to market appreciation.

Conclusions

Based on a repeat sales approach, the quality adjusted North American professional sport franchise index developed here has no upward trend over the past forty years. Instead, the

quality adjusted price index appears to have peaked decades ago, indicating that the large increases in franchise prices documented by Fort (2006) cannot be attributed to market wide forces. Put another way, changes in the quality of individual franchises appear to drive increases in the value of professional sports franchises. Based on the results from hedonic models of franchise values, the main factors associated with franchise quality are market income and population, facility characteristics, and on-field success. Market income and population have both increased significantly over the past century in North America. The four major professional sports leagues operate as monopolies in North America, and therefore restrict the number of franchises in order to generate monopoly rents. This restriction in the number of franchises in the face of increasing population and income clearly drives some of the increase in franchise values reported by Fort (2006).

Facility characteristics also affect franchise quality. Zimbalist and Long (2006) document an explosion in new facility construction in professional sports beginning in the early 1990s, and also show that public funds constituted an increasing fraction of money used to finance this stadium and arena construction boom. The hedonic based quality adjusted franchise price index in Humphreys and Mondello (2008) increases sharply after the mid 1980s, suggesting that general market conditions in the market for professional sports franchises contributed to much of the recent increases in professional sports franchises. This result also suggested that the increasing subsidies for new facility construction (as well as the increasing monopoly rents discussed in the previous paragraph) were not the only factors driving recent franchise price increases. Our results paint a less rosy picture. Since the repeat sales based quality adjusted price index declines over time, factors like the increasing subsidies for new sports facility construction appear to contribute much more to increases in professional sports

franchise values than was previously thought. While these new facilities enhance the experience of fans attending games by providing improved sight lines, seats and amenities, they also appear to line the pockets of wealthy sports team owners by ensuring that they will realize large capital gains when selling the franchise.

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