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Private Financing and Sports Franchise Values: The Case of Major League Baseball

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Abstract

This paper examines the impact of receiving a new stadium on team franchise values. I argue that a new stadium will increase the franchise values of teams regardless of how construction was financed. A team playing in a stadium that it owns will be able to capitalize the value of the stadium in the team's franchise value and will thus have a higher franchise value. Using panel data for Major League Baseball teams from 1990-2002, I find that, after controlling for team quality and metro area differences, regardless of the financing mechanism, a team playing in a brand new stadium realizes an increase in its franchise value. I also find that a team playing in its own stadium has a higher franchise value than a team playing in a public stadium. However, the difference in franchise values between playing in a team-owned stadium and playing in a public stadium does not offset the average cost of constructing the stadium. The paper thus provides a deeper understanding the determinants of franchise values and of the motives of sports team owners in their lobbying efforts for public subsidies.

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1. Introduction

During the 1990's, many teams in the four major American sports had new stadiums or arenas constructed. In 1990, the average Major League Baseball (MLB) ballpark was almost 34 years old and only 2 of 26 teams (Toronto and Minnesota) played in ballparks that were less than 10 years old. By 2002, the average park was only 24 years old and 12 of 30 teams played their home games in stadiums that were 10 or fewer years of age and 4 other teams played in stadiums that were 15 or fewer years of age. By 2004, three other teams (Cincinnati, Philadelphia, and San Diego) were playing in new stadiums and one other team (St. Louis) was having a new stadium built. In most cases, the construction costs of these new stadiums were financed with various sources of public funds.

The 1990's also saw an increase in research into the effects that sports teams and sports stadiums have on local and regional economies. Some of this research was commissioned by the teams themselves. Typically, as part of a formal request for public funds, team owners commission so-called "economic impact" statements to quantify the effect that a new stadium will have on the host city's economy. Not surprisingly, these statements claim that the construction of new stadiums generate millions of dollars of economic output and hundreds of jobs in the host cities and regions.

For an example of such a claim, a consultant calculated that the construction of a new National Football League (NFL) stadium in Arlington, Texas, will have a one-time impact of over $71 million (using 2010 dollars) and will support 457 jobs in the city of Arlington alone (Economic Research Associates, 2004). For Tarrant County, the estimated one-time impact of the construction of the stadium exceeds $348 million and 2,222 jobs. The report also states that Arlington will realize an average annual impact of over $155 million in output and 226 jobs from the day-to-day operations of the stadium while Tarrant County will realize an average annual impact of almost $280 million in output and 983 jobs.

Independent analysts, on the other hand, are skeptical about such claims. For example, studies by Baade and Dye (1990), Rosentraub, Swindell, Przybylski, and Mullins (1994), and Baade (1996) find that sports teams and their stadiums, on average, do not provide significant impacts on local or regional economies although they find some small impacts in some cities. Baade and Dye (1990) find a significant negative effect on the host cities' regional share of income and their regional share of retail sales in cities that had baseball stadiums built or renovated between 1965 and 1983. Furthermore, Coates and Humphreys (1999), examining the 37 cities in the United States with National Basketball Association (NBA), NFL, or MLB teams, find that the existence of these teams is negatively correlated with the level of real per capita income in a city. Coates and Humphreys (2000) examine specific industries within the same set of 37 cities as their 1999 paper and find that the presence of a sports team is associated with increased levels employment and earnings in the amusement and recreation sector. The presence of a sports team, however, is associated with decreased employment and earnings in all other sectors by an amount that offsets the increase in the amusement and recreation sector. This suggests that spending on sports teams in a metropolitan area mostly represents spending that is merely redistributed within the area's economy. This explains the overall findings in their 1999 paper.

The independent evidence suggests two items. First, it suggests that, at best, the economic impact statements examine the benefit side of the issue and, thus, are measuring gross impacts on output and employment. A complete economic impact statement would measure both the marginal benefits and the marginal costs of sports teams and sports stadiums.

Second, the existence of sports teams and stadiums in a metropolitan area causes consumers to redistribute their spending within a metropolitan area. At worst, it can actually decrease earnings and employment in their metropolitan areas. Hence, neither the existence of sports teams nor the construction of sports stadiums provide a catalyst for economic development in terms of employment and output growth.

But teams continue to put forth effort to secure financing for new sports stadiums, suggesting that playing in a new facility improves the value of a franchise. Alexander and Kern (2004) find evidence for this effect for MLB, NBA, and National Hockey League (NHL) teams.

This paper adds to the literature on public financing for sports stadiums and the effect of new stadiums on franchise values in two ways. First, it specifically examines the effect of private financing for new stadiums on team franchise values. While Alexander and Kern examine the effect of playing in new stadiums on franchise values, they do not account for the public/private share of construction costs – implicitly treating publicly funded and private funded stadiums equally. Moreover, since the existing literature does not contain such an analysis, it is not clear how or if, all else equal, a team’s franchise value differs when it plays in a publicly funded stadium compared to when it plays in a privately funded stadium. This study attempts to clarify this issue.

Second, Alexander and Kern examine the effect of a new facility on team franchise values through the use of a dummy variable. Presently, I measure the impact of the age of a team's home stadium on its franchise value – a more accurate measure of the "newness" of a facility. Overall, by examining the effect of a stadium's age and its public/private financing proportions, this paper provides a deeper understanding of the determinants of franchise values and the motives underlying the lobbying efforts of professional sports team owners in seeking public subsidies.

Using panel data from MLB during 1990-2002, I find evidence that the receipt of a new stadium enhances franchise values and privately constructing and owning a stadium further enhances franchise values. However, the increase in franchise value due to private construction and ownership does not fully cover the cost of constructing the stadium.

The rest of the paper is organized as follows. Section 2 describes the theory. Section 3 presents the empirical model and section 4 describes the data. Section 5 presents the empirical results and section 6 concludes.

2. Theory

The value of a franchise in period "t" measures its potential selling price in that period. For brevity, I refer to the current ownership group as "owner." Suppose the owner and prospective buyer are negotiating over the sale price of a team. Both seek maximum profits and both have perfect foresight[i]. The owner would not rationally accept less than the present value of the team's future profit stream and the prospective buyer would not rationally pay more than the present value of the team's profit stream. If the owner and prospective buyer discount future returns at the same rate and the revenues and costs are the same under either ownership group, the sale price of the franchise equals the present value of its profit stream. Under the assumptions, the team's franchise value measures the present value of its profit stream.

If profits accrue continuously, team i's franchise value in period t is given by

$$Franchval_{ti} = \int_{t=0}^{\infty} \left(R_{ti} - C_{ti} + \alpha V_{ti} - \delta L_{ti} \right) e^{-rt} dt \,. \tag{1}$$

R_{ti} is the gross revenue generated by the team in year t and C_{ti} represents the operating costs of running the team in year t. A team's operating costs includes items such as player and coach payroll, scouting expenses, player development expenses, and general and administrative expenses. r is the rate at which the owner and the prospective buyer discount the future. $t = 0$ is the current period. V_{ti} is the value of the building in which the team plays and α is a parameter that represents the ownership of the stadium. I assume, for simplicity, that α is a binary variable: if the team owns the stadium, then $\alpha = 1$. If the team does not own the stadium, then $\alpha = 0$ [ii]. L_{ti} represents a lease payment made to the owner of the stadium and δ is a binary variable that represents whether the team leases the stadium[iii]. If the team owns the stadium, then $\delta = 0$ and it has no lease payment. If the team does not own the stadium, then $\delta = 1$ and the team incurs a lease payment of δL_{ti}.

Suppose the team will receive a new stadium in some future period $n + 1$. Rewrite equation (1) as follows:

$$Franchval_{ti} = \int_0^n \left(R_{ti} - C_{ti} + \alpha V_{ti} - \delta L_{ti}\right)e^{-rt}dt + \int_{n+1}^{\infty}\left(\left[R_{ti} - C_{ti}\right] + \alpha' V'_{ti} - \gamma B_{ti} - \delta' L'_{ti}\right)e^{-rt}dt \quad (2)$$

The first expression on the right-hand side, $\int_0^n \left(R_{ti} - C_{ti} + \alpha V_{ti} - \delta L_{ti}\right)e^{-rt}dt$, represents the future profit stream in the old stadium. The second expression on the right-hand side, $\int_{n+1}^{\infty}\left(\left[R_{ti} - C_{ti}\right] + \alpha' V'_{ti} - \gamma B_{ti} - \delta' L^{i}_{ti}\right)e^{-rt}dt$, represents the future profit stream in the new stadium. V'_{ti} is the value of new the building and α' is a binary parameter that represents the ownership status of the new stadium and is defined as α is defined above. δ' and L'_{ti} collectively represent the team's lease payment in the new stadium and are defined as δ and L_{ti} are defined above. B_{ti} represents the total costs of building a new stadium and γ represents the proportion of the construction costs, including interest payments, borne by the team[iv]. Therefore, $(1-\gamma)B_{ti}$ represents the total value of the public construction subsidy[v].

A new stadium will enhance the revenues[vi] and operating costs generated by the home games played by the team. There will be a "newness" associated with the stadium that will draw people who otherwise would not attend the team's home games. Team revenues will also be enhanced because new stadiums include amenities that people find valuable – for example, wider aisles, newer restroom facilities, more comfortable seats, better sightlines for fans, and a retractable roof. The new stadium and its amenities increase the demand for the team's games which, in turn, enhance team revenues.

Quirk and Fort (1992) argue that if stadium construction is publicly subsidized, this may lead to "gold plating" – including amenities whose marginal private costs exceeds its marginal private revenues (for example, marble walls and gold-plated hardware in the bathrooms). If the stadium is publicly subsidized, the team may not fully account for the costs of providing the amenity. If so, the revenues generated by publicly financed stadiums may be even higher than in privately financed stadiums.

The new stadium will also increase the overall costs of operating the team. Since the demand for the team's games will increase, the demand for playing skills will be enhanced, translating into higher payroll for the team. But it will also enhance the value of scouting and player development, though to a lesser extent than it enhances the value of playing skills. Ticket operations would incur higher costs since the new stadium will increase the demand for the team's games. Lastly, since building a new stadium generates fan interest, the team would want to capitalize on this initial boost by further marketing and publicizing the team and the new stadium. Overall, regardless of the financing mechanism, the new stadium should enhance the team's profitability since no rational profit-maximizing owner would want a new stadium that would increase the team's costs more than its revenues.

Now turn to the costs of construction borne by the team owner. If the construction of the stadium is 100% privately financed, then $\gamma = 1$. Private financing can come either from the team itself or via a loan secured from some private interest. If the owner pays for the new stadium without securing a loan, then it incurs the construction costs and an opportunity cost associated with using its own funds to construct the stadium. If the owner secures a loan from another private source, the owner is responsible for repayment of the principal and the interest payments. In either case, the owner will incur the construction costs and explicit or implicit debt financing. In return, the owner will possess the stadium and will be able to capture the value of the building in the team's franchise value. If $V_{ti}^{'} > B_{ti}$, then ownership of the building will enhance the value of the franchise.

Now suppose that the construction of the stadium is publicly subsidized so that $\gamma < 1$. As γ falls, the construction costs borne by the owner also fall. But as $\gamma \to 0$, the likelihood that the team will possess the building falls. If the public owns the new stadium ($\alpha' = 0$) but the team pays some of the costs of construction ($\gamma > 0$), then the portion of the team's franchise value generated in the new stadium from equation (2) is $\int_{n+1}^{\infty} \left([R_{ti} - C_{ti}] - \gamma B_{ti} - \delta' L_{ti}^{'} \right) e^{-rt} dt$. Consequently, all else equal, a publicly-owned new stadium will give the owner a lower franchise value when the owner bears some of the construction costs. If the stadium is publicly funded and publicly owned, then $\alpha' = 0$ and $\gamma = 0$. The portion of the franchise value generated in the new stadium becomes $\int_{n+1}^{\infty} \left([R_{ti} - C_{ti}] - \delta' L_{ti}^{'} \right) e^{-rt} dt$. The franchise value of a team in such a situation will be higher than if it finances some of the construction, but it will be lower than a team playing in a privately-financed and privately-owned stadium.

In summary, new stadiums will increase the demand for the team's games and thus generate new revenues for the home team - regardless of the financing mechanism. The operating costs of teams with new stadiums will also be higher given that the increased demand for games will generate higher operating costs as well. Consequently, we expect that the franchise values of teams with new stadiums will be higher than those with older stadiums, regardless of how construction is financed. Furthermore, private ownership of the building will enhance the franchise value, but whether it increases franchise values sufficiently to warrant 100% private financing is an empirical question.

3. Empirical Models

The basic empirical model that I examine takes the form of

$$\ln franchval = X\beta + PRIV\gamma + \varepsilon \qquad (3)$$

where $\ln franchval$ is a vector of the logarithms of real franchise values (base year = 2001), X is a matrix of independent variables that impact team franchise values and PRIV is a matrix of variables that control for the financing and ownership of the stadium. β and γ are vectors of parameters to be estimated. ε is a vector of random error terms.

I include the logarithm of SMSA real per-capita income and the logarithm of SMSA population in each team's home metropolitan area. SMSA per-capita personal income and population both control for the drawing potential of baseball in the home team's SMSA. They thus control for team revenues and, through the demand for baseball talent, team costs. A positive and significant estimated coefficient on each suggests they positively impact profits and thus have a greater impact on revenues than costs.

In the X matrix, I include team winning percentage in the current year in the regressions. A higher team quality will provide more utility to fans and would, therefore, increase team revenues. However, since quality is costly to obtain, the team winning percentage measures will also control for costs. A positive and significant coefficient on team winning percentage suggests that its effect on revenues exceeds its effect on costs.

I also include the winning percentage from the prior season in each regression. This is an indicator of the current year's expected quality and is an important component in determining ticket prices, season ticket sales, early season tickets sales, media revenues, and advertising prices. It is also an indicator of the costs associated with players who remain on their teams from year to year. A positive and significant coefficient suggests that a better performance in the previous season leads to higher revenues than costs and, therefore, a higher franchise value in the current season.

I include the age of the stadium as a regressor in quadratic form. Age is defined as the number of years between the current season and the year the park opened. For example, if a particular observation is drawn from 1996 and the park opened in 1992, then age = 4 for that observation. If age = 0, then the team is playing in a brand new stadium.

The expected signs on the estimated coefficients depend on whether the stadium is a new stadium or an old stadium. A new stadium presents a novelty that will draw people in its initial years who otherwise would not have attended games. But this novelty should diminish over time. Consequently, I expect that team revenues will fall as a stadium ages. For these teams, since the operating costs should not change much as the stadium gets older, I expect that franchise values will fall as the age of the stadium increases.

Many of those who are attracted by the novelty of having a new stadium, however, will stop attending games in the future. But we expect those who continue to attend games over time will be those that, by and large, are not drawn to games because of the stadium but because of the game on the field. Consequently, I expect that revenues will fall at a diminishing rate for teams in new stadiums. Since the operating costs associated with a new stadium will not change much in the early years of stadiums, I expect that franchise values of teams playing in new stadiums will fall at a decreasing rate. Therefore, I expect the coefficient on the quadratic effect of stadium age will be positive for teams playing in new stadiums.

In the PRIV matrix, I include an ownership dummy equal to one for teams playing in stadiums owned by that team. I also include two interactions. I include an interaction between the age of the stadium and the proportion of stadium construction that was privately financed and an interaction between the ownership dummy and the age of the stadium. I also include quadratic terms for these dummies to control for different impacts over time with respect to these variables.

Lastly, I included year-specific dummies in each model to control for any year-specific impacts not captured by any other variable. 2002 is the reference year.

4. Data

To empirically examine the impact of public financing on sports franchise values, I present evidence from MLB during the period 1990 – 2002. I obtained SMSA per-capita personal income and population for the study from the US Bureau of Economic Analysis Regional Economic Information System (REIS). I obtained information on most stadiums, including the construction costs and public financing information, from Munsey and Suppes' www.ballparks.com. I supplemented this information with data from www.ballparksofbaseball.com and in personal correspondence with Rod Fort.

Financing information was not available for the Skydome in Toronto. In addition, I had incomplete macroeconomic data for Toronto and Montreal, so those teams were not included in the empirical analysis.

I obtained franchise values for each team, published initially in Financial World and then in Forbes, from Rod Fort's website at http://www.rodneyfort.com/SportsData/BizFrame.htm. As Alexander and Kern (2004) note, the true market value of a franchise is only observed when the franchise is sold. The franchise values published by Financial World and Forbes are thus estimates of the true market value of teams. The estimates are generated from surveys administered to teams to measure their revenues, costs, and thus their profits. Thus, they argue, the estimation of team franchise values represents reasonable attempts to ascertain the true market value of a team. Alexander and Kern also note that when a team is actually sold, its selling price is typically above the franchise value found in the Financial World-Forbes data - discrepancies that Alexander and Kern suggest are possible evidence of the winner's curse.

Indeed, from 1990-2002, there were 16 sales involving US baseball teams that represented 100% transfers of team assets to new owners or that didn't include the sale of a regional sport network. Over half of these 16 sale prices (9) were within 20% of the estimated franchise values and 4 more were within 25.4% of the estimated franchise values. Of these 13 sales, 9 of the sale prices were above the estimated franchise values[vii]. While not perfect, these estimates of team franchise values are reasonable measures of the true franchise values of teams and I take the discrepancies between actual sale prices and estimated franchise values as being within a reasonable difference.

5. Empirical Results

Tables 1 and 2 present the MLB teams that were in existence in 1990 and the home stadiums in which they played in 2002. Table 1 contains the information for teams that did not have new stadiums built during the period and Table 2 contains the information for teams that did have new stadiums built during that time. While playing in publicly financed stadiums is not new, there was only one new stadium that was built during the 1990-2002 period whose construction was not publicly funded – the San Francisco Giants‘ stadium – while three of the old stadiums were privately funded when originally constructed (Yankee Stadium, Wrigley Field, and Fenway Park). While private funding used to be the norm back in the early 1900's, it is the exception now.

In real 2002 dollars, the parks that opened during the 1990-2002 period that were completed before 1999 averaged approximately $211.3 million in cost. Those that were completed during and after 1999 averaged $345.37 million – 63.5% higher than those completed before 1999. The Producer Price Index for the "non-residential business" building industry increased by just over 20% from 1990 to 2002. The increase in stadium construction cost outpaced the PPI for non-residential business builders by almost 45 percentage points.

Tables 1 and 2 also present evidence that teams have run into more barriers when requesting public funds: from 1962 to 1982, the average public financing proportion of construction costs was 89% (97% when excluding Dodger Stadium). For stadiums built in the US since 1990, the public financing proportion fell to just over 68%.

Table 3 presents the summary statistics of the variables used in the empirical examination. Table 4 presents the regression results performed on the logarithm of real franchise values. I estimated five separate regressions, each differing in the manner in which private financing and ownership information was entered into the model. In model 1, I only control for private financing. In model 2, I control for private ownership of the stadium through an interaction term between the private ownership dummy and the age of the stadium. In model 3, I add in a quadratic term for the ownership-stadium age interaction effect. In model 4, I add in a dummy = 1 for each team that plays in a stadium that is at least partially owned by the team. In model 5, I take out the interaction terms.

I tested each model for the presence of random effects using the Breusch-Pagan Lagrangian Multiplier (1980) test for random effects. Each model exhibited the presence of random effects. I then performed a Hausman (1978) test to test for orthogonality between the individual effects and the regressor. I found no presence of orthogonality. The results of the Breusch-Pagan and Hausman tests are given at the bottom of each column in Table 4. Lastly, I performed a Wooldridge (2002) test for an AR1 process and found that each model exhibited first-order autocorrelation. I performed all regressions with STATA and I estimated a random effects AR1 model in each case.

The between, within, and overall R-squares are given at the bottom of each column in Table 4. The overall R-squares are all above 0.70 and the within R-squares are just below 0.80 or above, suggesting a good fit for the random effects models.

The coefficients on the logarithm of real per-capita income are insignificant in each model suggesting that the changes in real per-capita income do not significantly affect real franchise values.

The estimated coefficients for the logarithm of SMSA population are positive and significant in each model. The coefficients suggest that a 1% increase in the SMSA population increases team franchise values by between 0.093% and 0.121%. So, for a franchise valued at $200,000,000, a 1% increase in its SMSA's population would lead approximately to a $200,000 increase in the team's franchise value.

The coefficients on team winning percentage and lagged team winning percentage are positive and highly significant in each model. Those for the current team winning percentage are higher than their respective estimates for lagged winning percentage, suggesting that the current year's team quality is more important in terms of franchise value growth than last year's team quality. Regarding the previous year's team quality, fans generally use the performance of a team in one season as an indicator of how next year's team will perform. If it performs well, fans expect the team to do better in the subsequent season (all else equal), and the demand for team's games increases. Teams, realizing this, set the prices of their products (tickets, broadcast rights, etc.) accordingly.

In every model, the coefficients on stadium age are negative and significant. The coefficients in each models' quadratic stadium age term is positive but not significant. Therefore, when a team receives a new stadium, it receives a boost in its franchise value regardless of how the venue is financed. However, as the stadium ages, all else equal, the franchise value decreases. Moreover, the results are robust for both regressors across the models.

None of the coefficients on the age of the team, the years of the team in the city, or their quadratic terms are significant. These results, coupled with those on the age of the stadium described above, suggest that fans generally do not account for how long the team has been in the city or how old the team is when they make their consumption decision regarding the team. But they do account for how old the stadium is. These effects are accounted for in the team's franchise value.

The time dummies d1990 to d1999 are negative and highly significant in every model while those on d2000 to d2001 are insignificant in every model. Moreover, the coefficient estimates for each time dummy are consistent in terms of their values and mathematical signs across models. Since 2002 is the reference year, the results suggest that team franchise values increased from 1990 to 1999, but leveled off from 2000 to 2002. Moreover, in each model, the estimates of the time dummies decreased from 1990 to 1994, remained relatively steady in 1995, and then began to increase again until leveling off starting in 2000. 1990 to 1993 was the time during which baseball came out of its labor market collusion period while 1994 and 1995 were the years that were affected by the players' strike. The results suggest that franchise values began to recover from the effects of the strike in 1996. These results are consistent with the findings of Schmidt and Berri (2004) who find that demand shocks associated with labor disputes, at least in Major League Baseball, the National Hockey League, and the National Football League, are transitory and disappear soon after the dispute ends.

Now we turn to the private financing and private ownership effects. The coefficients on the stadium age – public financing proportion interactions are insignificant in every model. The coefficients on the quadratic terms present mixed results. In models 1, 2, and 5, the coefficients are negative but insignificant. In models 3 and 4, the coefficients are positive and significant at the 5% level of significance.

The coefficients on the ownership controls also show some mixed results. When the stadium age – private ownership interaction is included linearly (regression 2), its coefficient is negative but insignificant. When the quadratic term is entered into the regression (regression 3), the linear term becomes positive and highly significant, suggesting that an omitted variables problem existed in regression 2 with respect to the linear term. The coefficient on the quadratic terms is negative in both models and highly significant. It is also in these two models that the stadium age – private financing proportion quadratic coefficient is significant. The results in regressions 3 and 4 suggest that, as the stadium ages, if a team owns a stadium, all else equal, the team's franchise value increases. As the stadium ages, teams that built stadiums at least partially with private financing are paying off any debt associated with the construction costs. Moreover, since interest payments are higher earlier in the term of a loan, as the stadium ages, the team is paying off more and more of the principal, and thus gaining more "ownership" of the stadium. But at the same time, as the stadium itself ages (regardless of the financing mechanism), the team's franchise value is falling, offsetting the effect on private ownership.

Lastly, in models 4 and 5, I include a dummy for private ownership. The coefficient on this dummy is positive and insignificant in both models.

Figures 1 and 2 show results from calculating predicted real franchise values for the "average team" playing in stadiums of various ages in order to examine the effect of increasing age on team franchise values holding all other values constant. The average team is the team with the average values of the various statistics used in the regressions. We assume that the franchise value is referenced to 2002 (all time dummies are assumed equal to zero). I calculated predicted values using model 3 from table 4 for two types of stadiums: private and public and I assumed that if the team plays in a public stadium, it provided no funds towards that stadium's construction. If the team plays in a private stadium (i.e. it owns the stadium), then it financed 100% of its construction costs. Figure 1 shows the undiscounted estimated franchise values for a public stadium at various ages (dashed line) and the private stadium (solid line). Assuming the team played in a 40 year-old public stadium to begin with, when it receives its new stadium, its franchise value realizes an approximate increase of $42,000,000. As the stadium ages, the value of a team playing in a publicly-funded stadium falls (holding all other factors constant), while the value of a team playing in a privately funded-stadium increases, albeit at a very slow rate. At 50 years of age, the team playing in a privately-funded stadium is only approximately $84,000,000 higher in value than the same team playing in a publicly-funded stadium. Since the owner can expect the team to have a franchise value at least equal to the value of the team in a public stadium, it is the difference between these values that provides the return from playing in a private stadium versus playing in a public stadium.

According to Table 2, the 5 stadiums opened in 2000 or 2001 cost an average of $302,650,000 to construct. Figure 2 provides a diagram showing the present value of the difference between a team playing in a privately funded stadium and one playing in a publicly funded stadium (discounted at a 1%, 5%, 7%, and 10% rate). At a 1% discount rate, the present value of the difference is less than $55,000,000 (Panel 1). At a 7% discount rate, the present value of the difference is less than $3,000,000 at 50 years of age (Panel 3). At a 7% discount rate, the maximum present value of the difference is approximately $15,600,000 at 13 years of age. Even if the discount rate falls to 0, the present value of the difference never gets larger than $85,000,000, far below the cost of building the average new stadium opened in 2000 or 2001. No rational profit-maximizing team would want to spend $300,000,000 on a new stadium if it will not provide at least that much in marginal present value in return. My results suggest that it will not.

6. Discussion and Conclusion

In this paper, I examine the effect of the receipt of public funding for a new sports stadium on the franchise values of professional sports teams. I argue theoretically that the receipt of a new stadium should increase the revenue generating capability of a team but the receipt of a new stadium could increase operating costs as well. As long as the marginal costs are less than the marginal revenues, the franchise values of teams moving into new stadiums will be higher after the move.

The empirical results suggest that regardless of the financing mechanism, a new stadium provides a boost to team franchise values. If the team plays in a privately financed and privately owned stadium, the team's franchise values increases over time. If the team plays in a publicly owned and publicly financed stadium, as the stadium ages, the team's franchise value falls, all else equal. However, the empirical results suggest that the difference in franchise values between playing in a privately-owned, privately financed stadium and playing in a publicly-owned, publicly financed stadium does not offset the cost of construction, even if team owners do not discount the future. The paper thus provides a deeper understanding of the motives behind the lobbying efforts of professional sports team owners in seeking public subsidies.

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Table 1: 2002 Stadiums Built Before 1990

Team	Stadium	Year Opened	Construction Cost (Real 2002 Dollars)	Public Finance Proportion
Boston Red Sox	Fenway Park	1912	$650,000*	0.0%
Chicago Cubs	Wrigley Field	1914	$250,000*	0.0%
New York Yankees	Yankee Stadium	1923	$2,500,000*	0.0%
L.A. Dodgers	Dodger Stadium	1962	$136,904,762	17.0%
New York Mets	Shea Stadium	1964	$147,398,844	100.0%
Anaheim Angels	Anaheim Stadium	1966	$132,596,685	96.0%
St. Louis Cardinals	Busch Stadium	1966	$138,121,547	80.0%
Oakand Athletics	Network Associates Coliseum	1966	$140,883,978	100.0%
San Diego Padres	Qualcomm Stadium	1967	$149,193,548	100.0%
Cincinnati Reds	Cinergy Field	1970	$208,333,333	100.0%
Philadelphia Phillies	Veterans Stadium	1971	$200,000,000	100.0%
Kansas City Royals	Kauffman Stadium	1973	$283,400,810	100.0%
Minnesota Twins	Hubert H Humphrey Metrodome	1982	$139,664,804	97.3%
Average (1962 - 1982)			*$167,649,831*	*89.0%*

*Seasonally Adjusted CPI not available for 1912, 1914, and 1923

Table 2: 2002 Stadiums Opened 1990-2002

Team	Stadium	Year Opened	Construction Cost (Real 2002 Dollars)	Public Finance Proportion
Chicago White Sox	US Cellular Field	1991	$220,607,662	100.0%
Baltimore Orioles	Oriole Park at Camden Yards	1992	$128,205,128	100.0%
Cleveland Indians	Jacobs Field	1994	$212,378,641	48.0%
Texas Rangers	Ameriquest Field	1994	$231,796,117	71.0%
Atlanta Braves	Turner Field	1997	$263,157,895	100.0%
Seattle Mariners	Safeco Field	1999	$558,963,283	66.0%
Houston Astros	Minute Maid Park	2000	$261,233,020	68.0%
San Francisco Giants	SBC Park	2000	$266,457,680	0.0%
Detroit Tigers	Comerica Park	2000	$313,479,624	38.0%
Pittsburgh Pirates	PNC Park	2001	$265,989,848	81.3%
Milwaukee Brewers	Miller Park	2001	$406,091,371	78.0%
Average			*$284,396,388*	*68.2%*

Table 3: Summary Statistics

Variable	Mean	Std. Dev.
Real Franchise Value	203000000	108000000
Real Per Capita Income	32629.35	4418.259
SMSA Population	4674193	3283690
Team Winning Percentage	501.2308	69.78258
Lagged Team Winning Percentage	499.8669	67.38866
Stadium Age	30.1716	24.40059
Age of Team	73.86391	40.58722
Tenure in City	57.97929	38.97374
Privately Owned Stadiums	0.204142	0.4036708
n	338	

Table 4

Dependent Variable: Log of Real Team Franchise Value

Model	**1**	**2**	**3**	**4**	**5**
Intercept	14.24374***	14.7302***	14.41158***	14.43349***	14.15988***
	2.316335	*2.359887*	*2.298477*	*2.306191*	*2.322058*
Log of Real Per-capita Income	0.265987	0.2219265	0.2927276	0.2882827	0.2705483
	0.2237044	*0.2273032*	*0.2224856*	*0.2243932*	*0.2240027*
Log of SMSA Population	0.1195067**	0.1175212**	0.0933814*	0.0946953*	0.1214541**
	0.0565972	*0.0562964*	*0.0542452*	*0.0543678*	*0.0566885*
Winning Percentage	0.0006301***	0.0006291***	0.0006262***	0.0006266***	0.0006321***
	0.0001118	*0.0001119*	*0.0001111*	*0.0001114*	*0.000112*
Lagged Winning Percentage	0.0004567***	0.0004569***	0.0004262***	0.0004258***	0.0004543***
	0.0001101	*0.0001102*	*0.00011*	*0.0001103*	*0.0001105*
Stadium Age	-0.0066157***	-0.0066522***	-0.0064038***	-0.0061522**	-0.0059346**
	0.0024173	*0.0024154*	*0.0023721*	*0.0027639*	*0.0026941*
Stadium Age Quadratic Term	0.0000566	0.0000571	0.000055	0.0000521	0.0000486
	0.0000368	*0.0000368*	*0.0000361*	*0.0000396*	*0.0000394*
Age of Team	-0.0078749	-0.0084358	-0.0067315	-0.0065908	-0.0067991
	0.008824	*0.0088047*	*0.0084813*	*0.0086247*	*0.0089635*
Age of Team Quadratic Term	0.0000562	0.0000619	0.0000459	0.0000447	0.0000474
	0.0000617	*0.0000617*	*0.0000595*	*0.0000607*	*0.0000631*
Years in City	0.0107296	0.0113765	0.0084322	0.0083586	0.0096521
	0.0090703	*0.0090512*	*0.0087611*	*0.0088631*	*0.0092031*
Years in City Quadratic Term	-0.0000743	-0.0000803	-0.0000591	-0.0000584	-0.0000658
	0.0000634	*0.0000634*	*0.0000614*	*0.0000623*	*0.0000647*
Stadium Age - Private Financing Proportion Interaction	0.0038313	0.0029927	-0.0063556	-0.0064901	0.0031502
	0.0048578	*0.0049204*	*0.0056244*	*0.0056818*	*0.0049932*
Stadium Age - Private Financing Proportion Interaction Quadratic Term	-0.00000833	0.0000284	0.0002156**	0.000217**	-0.00000438
	0.0000674	*0.0000758*	*0.0000932*	*0.0000935*	*0.0000677*
Sadium Age - Private Ownership Dummy Interaction	-	-0.0025606	0.0185678***	0.0177701***	-
		0.0024065	*0.0068171*	*0.0081222*	
Sadium Age - Private Ownership Dummy Interaction Quadratic Term	-	-	-0.0003337***	-0.0003258***	-
			0.0001015	*0.00011*	
Private Ownership Dummy	-	-	-	0.0148966	0.0397416
				0.0834405	*0.0649171*

Standard Errors are given below the parameter estimates

*Table continued on next page

Table 4 – Continued

d1990	-0.460214***	-0.4614644***	-0.4752323***	-0.4756602***	-0.4632025***
	0.0670466	*0.0670254*	*0.0655251*	*0.0658331*	*0.0671372*
d1991	-0.5123435***	-0.5163667***	-0.5273889***	-0.5278817***	-0.5144807***
	0.0674302	*0.0675299*	*0.0660078*	*0.0663512*	*0.0674477*
d1992	-0.621675***	-0.6254588***	-0.6364634***	-0.6367101***	-0.6231076***
	0.0640277	*0.0641266*	*0.0627313*	*0.0629591*	*0.0640003*
d1993	-0.6419987***	-0.6465167***	-0.6566021***	-0.656945***	-0.6432963***
	0.0630505	*0.0632029*	*0.0618693*	*0.0621262*	*0.0630307*
d1994	-0.669801***	-0.6745092***	-0.684053***	-0.6840455***	-0.6699663***
	0.0598977	*0.0600753*	*0.0588383*	*0.0589732*	*0.0598476*
d1995	-0.6708641***	-0.6734981***	-0.6839827***	-0.6838305***	-0.6712524***
	0.0564767	*0.0565411*	*0.055485*	*0.0555908*	*0.0564406*
d1996	-0.5548749***	-0.5569667***	-0.5669657***	-0.5667532***	-0.5551039***
	0.0531188	*0.0531702*	*0.0522666*	*0.0523633*	*0.0530949*
d1997	-0.2170261***	-0.2181281***	-0.2285896***	-0.2286528***	-0.2181757***
	0.0486774	*0.0487061*	*0.0480031*	*0.0481319*	*0.0487047*
d1998	-0.1457435***	-0.1454422***	-0.1575888***	-0.1574864***	-0.1468201***
	0.0441055	*0.0441243*	*0.0436636*	*0.0437573*	*0.0441521*
d1999	-0.0899428**	-0.0905437**	-0.0930193**	-0.0925096**	-0.0889268**
	0.0403738	*0.0403942*	*0.0398616*	*0.0399865*	*0.0404302*
d2000	-0.0418286	-0.0417888	-0.0482836	-0.047886	-0.0414406
	0.034073	*0.0340901*	*0.0337997*	*0.0339093*	*0.0341228*
d2001	-0.0125282	-0.0121153	-0.0138845	-0.013824	-0.0126942
	0.025077	*0.0251029*	*0.0249624*	*0.0250201*	*0.0251307*
R-sq: Within	0.8007	0.7999	0.8089	0.8091	0.8027
R-sq: Between	0.5651	0.5704	0.6158	0.6141	0.5565
R-sq: Overall	0.7036	0.7084	0.7349	0.7343	0.7005
Number of Observations	338	338	338	338	338
Breusch and Pagan Lagrangian Multiplier Test for Random Effects (Ho: Random effects not present):	397.00***	393.06***	369.59***	347.81***	397.75***
Hausman Test for Random Effects (Ho: individual effects uncorrelated with regressors)	8.97	11.06	8.05	20.3	11.45
Wooldridge Test for an AR1 Process (Ho: No First-Order Autocorrelation Present	65.102***	65.696***	63.046***	62.786***	65.056***

*** significant at the 1% level or better
** significant at the 5% level up to but not including the 1% level
* significant at the 10% level up to but not including the 5% level

Standard Errors are given below the parameter estimates

Figure 1
Predicted Value - Getting a New Stadium (Old Public Stadium Age = 40)

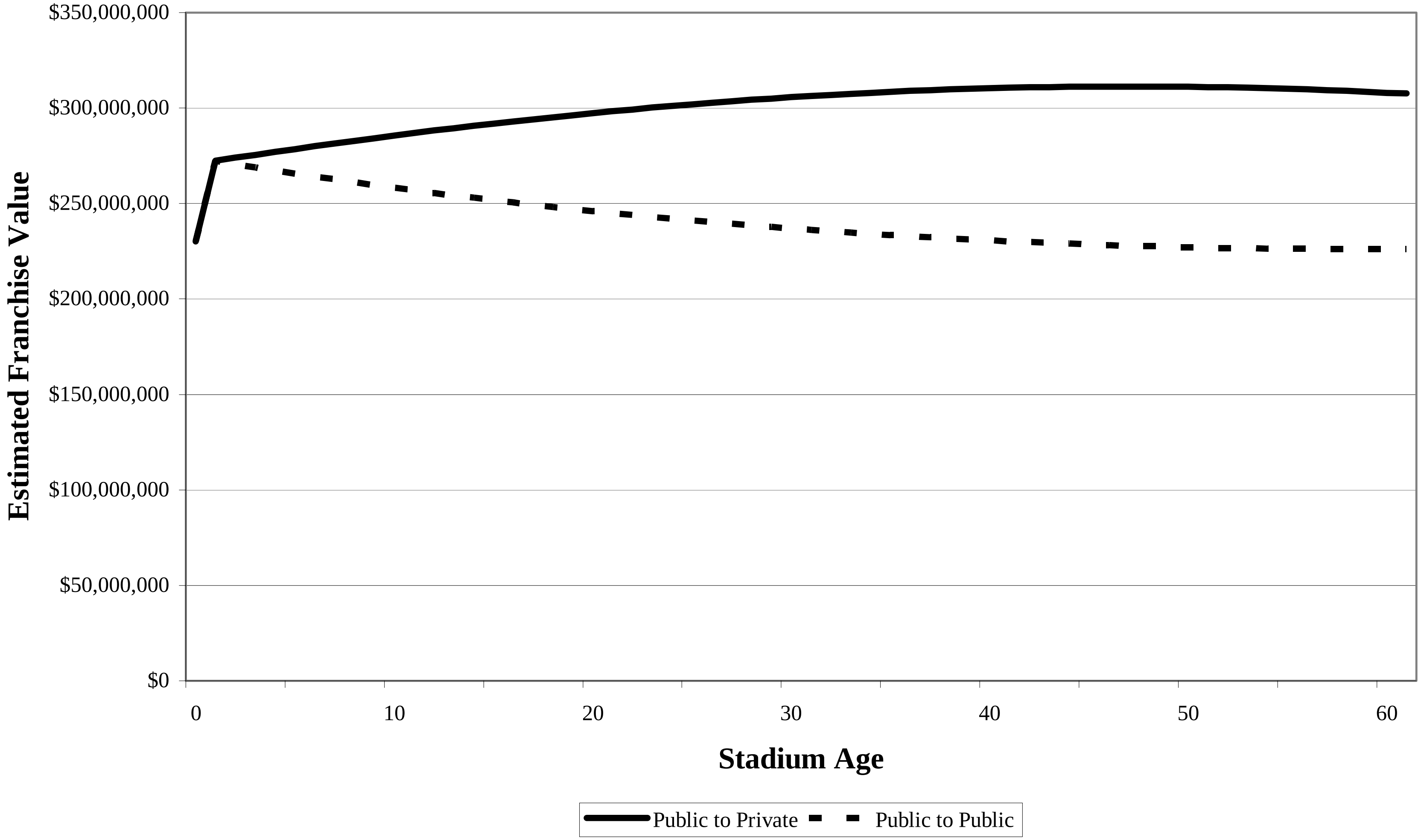
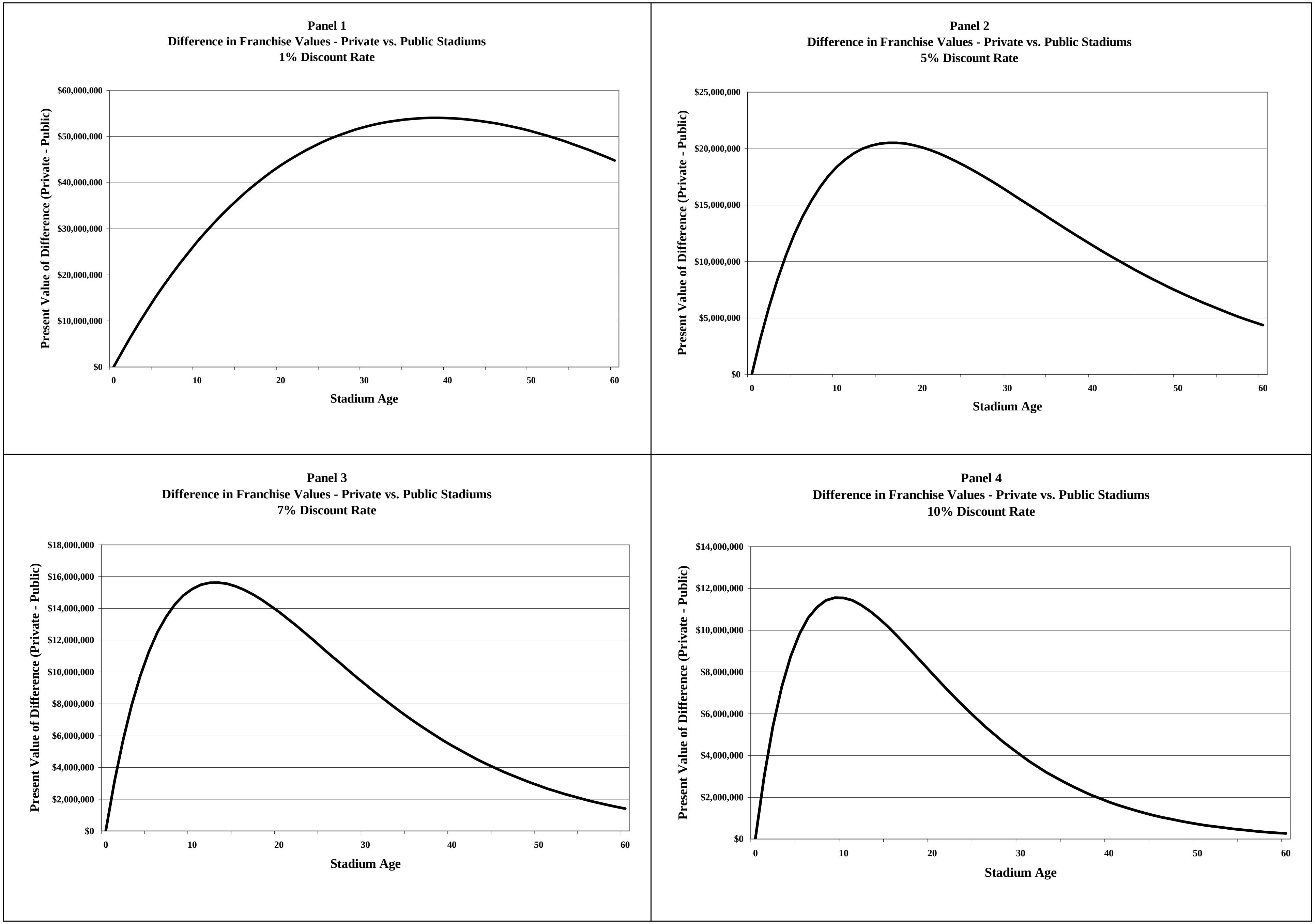


Figure 2



Panel 1
Difference in Franchise Values - Private vs. Public Stadiums
1% Discount Rate
$60,000,000
$50,000,000
$40,000,000
$30,000,000
$20,000,000
$10,000,000
$0
0
10
20
30
40
50
60
Present Value of Difference (Private - Public)
Stadium Age
Panel 2
Difference in Franchise Values - Private vs. Public Stadiums
5% Discount Rate
$25,000,000
$20,000,000
$15,000,000
$10,000,000
$5,000,000
$0
0
10
20
30
40
50
60
Present Value of Difference (Private - Public)
Stadium Age
Panel 3
Difference in Franchise Values - Private vs. Public Stadiums
7% Discount Rate
$18,000,000
$16,000,000
$14,000,000
$12,000,000
$10,000,000
$8,000,000
$6,000,000
$4,000,000
$2,000,000
$0
0
10
20
30
40
50
60
Present Value of Difference (Private - Public)
Stadium Age
Panel 4
Difference in Franchise Values - Private vs. Public Stadiums
10% Discount Rate
$14,000,000
$12,000,000
$10,000,000
$8,000,000
$6,000,000
$4,000,000
$2,000,000
$0
0
10
20
30
40
50
60
Present Value of Difference (Private - Public)
Stadium Age

[i] The assumption of perfect foresight is made for simplicity
[ii] During 1990-2002, only one team played in a stadium that it partially owned: the Milwaukee Brewers own 36% of Miller Park.
[iii] The lease payment can take the form of a rental fee for the use of the building or it can come in the form of shared revenue where the team gives a proportion of its revenues generated during the year as payment for use of the stadium. For example, the St. Louis Rams currently keep only 75% of the naming rights income for the dome in which they currently play (Noll and Zimbalist, 1997).
[iv] For simplicity, assume these costs do not occur until the team begins play in the new stadium.
[v] Public subsidization comes in a variety of sources. A government can subsidize the construction costs of building the structure (a construction subsidy), it can subsidize the costs of providing infrastructure around the building (an infrastructure subsidy), or it can simply give the team a transfer payment. For simplicity, we focus on construction subsidies.
[vi] There is a possibility that particular owners, in practice, may shy away from adding revenue-enhancing amenities for fear that they would induce increases in costs elsewhere, like player salaries. Such behavior is assumed away for simplicity.
[vii] This is based upon sale price and franchise value data obtained from Rod Fort's website and supported by press articles obtained by the author from various web sources. These results are available upon request by the author.