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Abstract

One of the most interesting issues in state and local public finance over the last 10-15 years has been the debate over state and local contributions to professional sports stadiums. Despite a large amount of empirical evidence indicating that state and local governments receive very little, if any economic benefit from the stadiums they help build, for some reason they keep building them (Bade, Rosentraub). Much research has gone into this issue, and essentially the same result was found each time: stadiums are poor investments for governments.

Professional Sports Attendance as a Proxy for New Stadium Spillover Benefits

By Ken Perry

I. INTRODUCTION

One of the most interesting issues in state and local public finance over the last 10-15 years has been the debate over state and local contributions to professional sports stadiums. Despite a large amount of empirical evidence indicating that state and local governments receive very little, if any economic benefit from the stadiums they help build, for some reason they keep building them (Bade, Rosentraub). Much research has gone into this issue, and essentially the same result was found each time: stadiums are poor investments for governments.

Good financial investments though, are not the only things governments spend money on. Certainly no one would argue that parks are good financial investments for cities, yet they are built. Counties participate in a variety of activities that probably do not have the financial return of a U.S. Government Bond or some other form of investment. Very little research though, has been done evaluating other possible gains from a new stadium, otherwise called spillover benefits, similar to those coming from a park or other public goods. This paper attempts to identify and to a certain degree quantify these benefits through stadium attendance levels, with the hope of giving cities a way to refute stadiums as being poor investments. Section two of this paper will explore why stadiums are bad investments. Section three will examine research to date on this topic. Section four will explain my theory in attempting to quantify these spillover benefits and examine my research design. Section five will present my results. And Section six will conclude the paper and offer any implications it might have.

II. STADIUMS AS BAD INVESTMENTS

When governments attempt to convince voters that their area is in need of a new stadium for its professional teams, the most often used reason for the subsidy is that the new stadium will help the local economy. The theory is that a new stadium will bring with it new jobs (through construction and stadium workers), an increase in tourism, general entertainment spending, and a host of other factors that will help increase the financial position of the area. Empirical evidence shows this is simply not the case.

Robert Baade, one of the foremost authorities on the economics of professional sports, specifically relating to stadiums, has shown time and again that professional sports and the places in which they play have no impact on an area's economy (Baade, 1997). Baade conducted a case study in 1997 regarding the recently built Safeco Field in Seattle, WA. Using research data compiled by the State of Washington when it considered subsidizing the project, as well as economic data from Phoenix, AZ (the site of a recently built similar stadium), Baade was able to show that by investing the taxpayers money in this stadium as opposed to other alternative avenues of investment the county gains no economic benefits. Other rates of return are given, as are three projected rates for the stadium (optimistic, moderate and pessimistic). All three rates show less than a 2% rate of return for taxpayers, compared to as much as a 13.5% rate for the other forms of investment. In addition Baade points out that if the county were to own the stadium, as the plan called for, risks would increase as well. Should the team move, the area would have accepted a huge cost that would eventually then amount to very little long-term gain. Clearly then, Baade is able to show that stadiums simply do not make good economic investments.

III. THEORY

It is clear that stadiums do not provide the economic windfall that localities would like them to provide. However, the point is that stadiums are still being built mostly at taxpayer expense. The question now is why? One argument is the idea that stadiums

provide some form of spillover benefit similar to a park or a zoo. The logic here is that people benefit from the stadium as a form of entertainment, like they would if they were to go to the civic opera, or symphony orchestra. Watching a football team, although certainly different in nature, would provide similar entertainment benefits.

Looking broadly first, one important theory on local spending comes from Charles Tiebout (1956). He argues that cities attempt to reach an optimum fiscal level, for him this being the maximization of their optimum size. He feels that governments will attempt to match the preferences of people with the hope of achieving their ideal population. People will then find a city where their utility of government policies is maximized. Applying this to local stadium expenditures, it seems that those cities with stadiums then, are building them to attract (in most cases) more citizens to their city, or to meet the preferences of those already living in the area. Since cost and investment figures are ignored in his theory, and it is clear that new stadiums do seem to provide some additional utility to the local area, Tiebout's argument might seem to support government's subsidizing stadiums. If people did not want these new stadiums, they would leave cities that were continuously financing new stadiums for teams, according to Tiebout.

To apply this theory to a real world situation, let us examine Seattle, Washington. Recently, the area of Seattle decided to contribute significantly to the building of new stadiums for both the Seattle Seahawks and Seattle Mariners teams. If Tiebout were right, and people did not want such spending, they should theoretically leave the area. Of course applying such theory to the real world is difficult. People do not live in a vacuum and each decision affects countless others. Certainly it seems plausible that people may not have agreed with the government's decision to help the teams but may not leave the area for a variety of other reasons such as jobs, family, school, etc.

Despite the economic evidence against them, many sports economists and studies have argued for such intangible benefits created by stadiums. Despite the countless evidence he himself has found calling for an end to stadium subsidizing by state and local governments, Robert Baade is still able to see a stadium's intangible benefits. In a 1996 article refitting a paper written in response to something he had previously written, Baade argues: "The most significant contribution of sports is likely to be in the area of intangibles. The image of a city is certainly affected by the presence of professional franchises. Professional sports serve as a focal point for group identification. Sports contests are a part of civic culture. There may well be a willingness of voters to pay taxes to subsidize this kind of activity just like there is for parks and museums."

Even from a man who is clearly able to see stadiums as poor governmental investments, we still see a justification for the subsidizing of stadiums. If sports and conduits of sport such as stadiums, are considered part of the civic culture, some justification can be made for the public funding of them. Certainly other portions of civic culture such as parades, fairs, performances and displays are financed by the government. Justifying a stadium in this sense then, seems reasonable as well. Furthermore, if these stadiums serve some role in group identification, this only furthers such a justification for stadium expenditure. Regardless, Baade, one of the foremost authorities on the topic, seems to feel that stadiums do provide some form of spillover benefits to the community.

Others have even attempted to identify and quantify these benefits in the form of an empirical study. The first was published in 1998 by Mark Rosentraub and David Swindell, two other leading authorities on stadium financing. They conducted a survey in which they set out to quantify these spillover benefits. In addition to the survey, their paper also explains some theory regarding these spillover benefits. Rosentraub and Swindell argue that many intangible benefits can be brought to a city by a new stadium. They see an increase in a city's image, coming from a high-profile team or sporting event like the Super Bowl. They talk of a celebratory benefit to even those non-fans should teams win a championship or find great success. Essentially, they feel that in a culture where sports play a huge role, teams create a level of civic pride for the area. Such contributions to the quality of life in a given area seem to justify governments paying for athletic facilities.

They also are able to justify public spending on stadiums in terms of professional sports not necessarily beomg a public good, like a park or national

defense, but something more along the lines of a "toll" good. In essence, Swindell and Rosentraub point out that, although games can be considered a form of joint consumption (all can watch without hurting others enjoyment), stipulations can be put on the good to charge viewers to see the product. For those attending the game it is the price of the ticket and for those watching on television or listening to the radio, their "fee" is the commercials which are a portion of the broadcast. This fee, be it in ticket price or in dealing with commercials is the "toll" consumers are then forced to pay. Despite this toll however, Rosentraub and Swindell feel that if spillover benefits can be generated by teams and, in effect, stadiums, justification can be found for supporting teams through tax dollars.

With that, they conducted a telephone survey of 1,536 citizens of Indianapolis in 1996. They attempted to measure "cultural identity and civic pride" associated with local teams, sporting events such as the Indianapolis 500, and other local points of interest. Top responses included the two professional teams, the NFL's Colts and NBA's Pacers, with the top response being the Indianapolis 500. In addition they were also able to show a strong correlation between attending the events and amount of civic pride associated with a city. Their findings lead them to make the statement that "Sports teams are clearly critical in establishing the sense of pride respondents have in living in Indianapolis" (Swindell & Rosentraub, 1998).

Such a statement leads one to believe that spillover benefits might exist from professional sports. Although I may not necessarily agree with their definition of professional sports as a toll good, I do feel their argument regarding spillover benefits is highly significant. It seems that the majority of costs they identify, in terms of those viewing the game, seem to come in the form of advertising on television or radio. In my opinion, neither provides little if any costs to the consumer, especially when considering that consumers can merely leave the room or change the channel. With such little costs imposed on those watching the game, is it still fair to argue that these costs even exist?

Another study attempting to identify the spillover benefits created by athletics was done in 1997. Bruce Johnson attempted to capture the public value of the University of Kentucky Wildcats Men's Basketball by means of a contingent valuation method (CVM) approach. The CVM approach is commonly used when measuring the value of environmental projects. Such an approach is able to capture both non-use value (those not attending the games but concerned nonetheless) and use values (those actually attending the games). Non-use was captured by identifying those who "talked about games or read or listened to results and commentary about them in newspapers, on the radio, etc" (Johnson & Whitehead, 2000). What Johnson found was not surprising.

Of the 230 returned surveys out of the 500+ sent out, only 7.4% claimed to have never watched a game. Furthermore, approximately 88% professed to be at least casual fans of the Wildcat program. In addition, almost half believed the quality of life in Kentucky would decrease without the team. Even ignoring the probable selection bias that such a mail-in survey would create, such results are hard to ignore. Clearly, this team plays a huge role in the community.

Johnson next attempts to place a value on these benefits by asking how much each respondent would be willing to spend on building a new stadium for the team. His results seem, like most attempts to value a public good, undervalued. This undervaluing, caused by a phenomenon known as the "free rider," occurs when consumers of a good, in this case UK basketball, think that regardless of how much they spend to buy/keep the good, others will pay the difference. As a result each person surveyed will undervalue the good, thus underestimating the good's true worth.

Perhaps the most important theoretical work done on stadium financing by state and local governments was done by Siegfried and Zimbalist (2000). They argue that stadiums do in fact provide spillover benefits for their community. As the authors see it, stadiums and the teams that play in them "create external benefits for local residents". Some of these benefits include, giving a city "major league" status, creating an incentive for the team to continue performing well, and making the team less likely to stay in the community. But perhaps the most important argument is in regards to the way these benefits in

part amass: "...there are direct benefits that accrue to hometown fans who attend games" (101). Such logic is essentially the foundation for this research. By assuming these benefits accrue through attendance, measuring the change in attendance can in some way quantify these benefits.

IV. RESEARCH DESIGN

These theories all seems to point to the idea that stadiums do in fact provide some form of spillover benefits for local citizens. People seem to benefit in some way from the existence of professional teams. Furthermore, it also seems clear that citizens benefit from a new stadium being built as well. It seems fairly certain that we have been able to identify that these benefits do in fact exist. The problem though, is in attempting to assign a value to these benefits. To date, no study has really attempted to quantify these benefits. Such is the goal of this research.

By examining attendance levels at both the old stadium and new stadium, it seems that we would be able, in part, to see how people value the new stadium. If attendance levels significantly increase, people are making the decision to attend the game as opposed to some other activity they may have chosen otherwise. It is this change that is significant. For if a person chooses to go to a ball game on a Saturday night instead of the theatre, that person feels he is better off as a result of watching the game compared to attending the play. If his decision before the new stadium was the play, and now it is the game, and the only thing that changes is the stadium, it seems plausible then that it is the stadium itself that is making this person better off. It is my contention that these new stadiums do provide some form of spillover benefit and that as a result the surrounding area is better off. People could be doing otter things and spending their leisure budgets elsewhere (movies, museums, etc.) like they were before the stadium was built. Now they are not. Theoretically, this is because their preferences led them to this new stadium.

To test this theory, all '20 professional sports teams in the National Basketball Association (NBA). National Football League (NFL) National Hockey League (NHL) and Major League Baseball (MLB) have been examined. Despite the research implications of this study dealing primarily with state and local funding of stadiums, it seems reasonable that only using publicly funded stadiums would not be necessary. Regardless of how each stadium is funded, the new stadium should provide the same spillover benefits. The only difference then, is how these benefits were paid for. In addition to including both government and non-government funded stadiums, in order to increase the number of cases. The teams themselves became the unit of analysis, and not the stadium. The reason for this is that some teams, such as the Chicago Bulls and Blackhawks play in the same stadium, and theoretically, should then provide the same spillover benefits. Again, to increase our caseload, each team is treated individually, almost as if they played in two separate stadiums. The idea here being that if the other team did not play in the stadium, the stadium would still be providing benefits to the community.

For each team, the opening date of the stadium currently being played is identified, and the attendance level data (per year) for the five years prior to completion of the stadium and five years after is used. NFL, and NHL data was compiled from a comprehensive website for stadiums, www.ballparks.com. NBA data was found at the official NBA website www.nba.com. MLB data was taken from the 2000 edition of The Sporting News Complete Baseball Record Book. An average for the five-year periods was taken and a composite number far both before the stadium and after the stadium was created. For cases that do not have five years of data for both periods, the data available was averaged. For example, if a team's stadium was built in 1997, only three seasons have been played since the stadium's opening. As a result, only those three years are averaged.

Of the 120 teams, 67 have been included in the study. The other 53 that were lost were mostly NHL and NFL teams playing in stadiums built early on in the century. It is unknown as to whether attendance figures exist for this time-period in these leagues, or simply if this data is unavailable.

These composite averages were compared using the differences of means test to see if the differences between the two averages (pre and post stadium) were statistically significant, by taking into account the standard deviations of the sets of cases, as

well as the number of cases in each set (Mansfield, 1994). Four comparisons were made as follows in order to partially control for some of the other factors affecting sporting attendance:

OVERALL. The entire pool of 67 teams with attendance figures were first taken and tested. This is the initial test to identify if the theory in general is to hold.

SPORT. After collecting the data, it became apparent that huge discrepancies exist between sports. For example, baseball plays 100+ games while football plays 16. Basketball stadiums can hold roughly 20,000 fans, while a football stadium can hold well over 50,000 people. Baseball and football are played primarily outdoors, where fans must endure the weather. Hockey and basketball are played indoors, where the weather will probably not keep people away. As a result, it seemed necessary to control for these differences. For this comparison, the 67 teams were split into their four respective leagues, NBA, NHL, NFL, and MLB, and the averages were compared for each sport.

YEAR. Another possible factor in stadium attendance levels is the time period in which the stadium opened. Professional sports have grown over the last 100 years to become one of the most prominent factors in our society. Because of this growth, there may be differences in attendance levels when Boston's Fenway Park opened in the early 1900's is compared to Chicago's New Comisky Park which opened in 1991. Furthermore, spending and economic levels certainly were different as time went on as well. This leads one to believe that the time period in which a stadium opened may have played a role as well. Also, the media's portrayal of both professional sports, and the stadium has changed over time, another possible factor pointing to a difference in time periods. To examine this phenomenon, the 67 cases were broken down into two time periods, early and modern. Early stadiums are considered to have been built before the stadium boom started in the 1980's. Modem stadiums are considered to have been built after 1980. It should also be noted here again, that a majority of data regarding the NHL and NFL, especially in the early time period is not available, thus significantly lowering the number of cases in that category.

TEAMS SUCCESS. Denunert (1973) found a significant relationship between a team's success and attendance levels, leading one to believe that a team's performance may affect an attempt to measure these spillover benefits. To control for this, each team's winning percentage for the years in question was found, and averaged to create an index, just like the one for attendance. Teams were then put into one of four groups: teams that were winners both in the old stadium and the new, teams that were losers in both the old and new stadiums, teams that won in the old but not in the new stadium, and teams that lost in the old and won in the new stadium. Teams were defined as to be a "winning team" if their percentage was over .500, and a "losing team" if they were under .500. Again, the averages between these were compared in each group to see if the differences in average attendance levels were still significant.

Assuming all four tests show the differences in attendance to be significant in the positive direction, it would seem that the idea that stadiums provide some sort of spillover benefit may he enhanced to a certain degree.

V. RESULTS

The results of the first differences in means test were essentially as expected. The results cast be found in Table 1. Even without the statistical test, it is clear that some difference can be found. An almost 300,000 average person difference seems to tell a significant portion of the story. It is clear that something is affecting behavior in a fairly large way. Looking at the results of the difference of

Table 1: Results of Differences of Means Test 1

Comparison 1: Overall	**Old Stadium**	**New Stadium**	
Mean:	798,658	1,093,018	Difference: 294,359
Standard Deviation	566,887	816,843	
Critical Result	2.37*		

Table 2: Results of Difference of Means Test 2

Baseball (21 Cases)	**Old Stadium**	**New Stadium**	
Mean:	1,345,500	1,965,618	
Standard Deviation	701,539	930,255	Difference: 620,118
Critical Result	2.44*		
Basketball (21 Cases)			
Mean:	535,316	671,963	Difference: 136,647
Standard Deviation	184,218	185,347	
Critical Result	2.40*		
Football (6 Cases)			
Mean:	392,809	531,826	Difference: 139,017
Standard Deviation	81,702	33,625	
Critical Result	3.85**		
Hockey (16 Cases)			
Mean:	578,761	710,814	Difference: 132,053
Standard Deviation	113,284	79,780	
Critical Result	3.81***		

*Significant at 95% Confidence Interval
**Significant at 98% Confidence Interval
***Significant at 99% Confidence Interval

means test, this difference can be explained more readily. As Table 1 points out, a Critical Result of 2.37 leads to a significance at the 95% Confidence Interval, meaning that there is a 95% chance that the difference between the means is statistically significant. This seems to lend a fair amount of credibility that a new stadium makes a difference inattendance figures, and seems to support Swindell and Rosentaub (1998), as well as Baade (l996) who argue that spillover benefits from teams and stadiums attendance figures, and seems to support Swindell and Rosentaub (1998), as well as Baade (l996) who argue that spillover benefits from teams and stadiums do exist.

The results of the second difference of means test, controlling for sport can be found in Table Two.

The results of the second test once again show a high degree of confidence in the difference between the means. For all four sports we are able to argue with a high degree of probability that the differences of means is significant. As can be seen in the table, baseball and basketball are significant at the 95% confidence interval while football is significant at the 98% and hockey is significant at the 99%.

The results of the third test does not lend the support of the first two. These results, controlling for the year each stadium was built, can be found in Table 3.

As Table 3 shows, the Critical Results from the differences of means tests controlling for the year the stadium was built are not as high, statistically compared to what was found in the previous tests. Perhaps this shows that the year stadium was built, and

Table 3: Results of Differences of Means Test 3

Stadiums Prior to 1990(22 Cases)	**Old Stadium**	**New Stadium**	
Mean:	813,700	1,203,126	Difference: 389,426
Standard Deviation	522,279	854,028	
Critical Result	1.83**		
Stadiums After 1990(42 Cases)			
Mean:	790,780	1,035,343	Difference: 244,563
Standard Deviation	594,895	801,105	
Critical Result	1.59*		

*Significant at 80% Confidence Interval
**Significant at 90% Confidence Interval

Table 4: Results of Differences of Means Test 4

Losers/Losers(24 Cases)	**Old Stadium**	**New Stadium**	
Mean:	573,040	797,335	Difference: 224,294
Standard Deviation	223,143	385,417	
Critical Result	2.46*		
Losers/Winners(11 Cases)			
Mean:	890,468	1,298,211	Difference: 507,742
Standard Deviation	631,143	1,000,400	
Critical Result	1.42		
Winners/Losers(9 Cases)			
Mean:	792,309	905,744	Difference: 113,435
Standard Deviation	558,773	762,477	
Critical Result	.360		
Winners/Winners(16 Cases)			
Mean:	1,021,763	1,364,256	Difference: 342,493
Standard Deviation	763,600	1,001,321	
Critical Result	1.23		

*Significant at 95% Confidence Interval

the time period being considered does in fact play a role in the differing attendance levels. Another possibility might be the way the data set was split. It was thought that by finding a near symmetrical split to the data would be best in that the number of cases in each set would be somewhat the same. By doing this though, the cutoff year was pushed later on in the century, primarily because the majority of the data set comes from the 1980's and 1990's. Using an earlier year as the cutoff, possibly near the middle of the century, may alter the findings significantly.

The results of the fourth control, teams levels of success, can he found in Table 4.

The results of the fourth control, those dealing with a team's level of success, specifically controlling by a team's winning percentage before and after the stadium, are clearly the least supportive test to the idea that stadiums might provide public benefits to communities. Only one of the four groups, the one dealing with losing teams both before and after stadium completion showed a high confidence interval, its being 95%. The other three tests, as shown in the table, were not significant at any level.

Findings from this test may lead to various conclusions. First of all, it seems natural that the unsuccessful teams would increase attendance. For if a team were unsuccessful, most people would not want to go see them play. However, if that team were to get a new stadium, people might want to go and see the building. In that type of situation, the only thing that would drive up attendance would be the new stadium. It is unclear though as to why the other three groupings in this test did not show any significant changes in attendance. When examining the descriptive statistics, table 4 shows that all three have very high standard deviations, which probably accounts for the for the low critical results, since differences between the means remains relatively the same. In addition, all four tests have a low numbers of cases, which drops the critical result as well. Furthermore, the huge differences between the sports pointed out before, are once more not controlled thus skewing the data again, especially the standard deviations. With such a small number of cases, those differences in sports attendance levels is magnified even more, which is probably why it was not picked up in the overall test and time period test.

Of course, it should be once again pointed out that this is not the entire set of cases, but merely as complete a set as could be put together. However, it should also be noted that in only three instances did attendance levels actually decrease when a team changed venues, Boston's Fenway Park in 1912, Seattle's Key Arena built in 1983, and Chicago's Wrigley Field which opened in 1914.

VI. CONCLUSIONS AND POLICY IMPLICATIONS

As these difference of means tests show, the opening of a new stadium appears to have a statistically significant impact on attendance levels. Some further points however, need to be made.

First, it should he noted that the number of cases is a little more than half of the entire population of major professional teams in he U.S. and Canada. Although there is no reason to believe that this section of data is not representative of the entire population, it still should be noted that this is not a complete picture being examined. It is merely as much of the picture as is available to us. Second, it should also be noted hat this increase in attendance is not a clear definitive argument for the increase in spillover benefits from a new stadium. Attendance is only being used as a proxy for these benefits, based in part on theory from Siegfried and Zimbalist (2000), which may or may not be representative of the benefits attempting to be measured. It would also be useful to run the same tests, using some level of radio or television viewers, however data for such an examination was not available. However, the results of this research do seem to support Baade (1996), Johnson and Whitehead (2000), and Swindell and Rosentraub (1998) in that it seems to argue that people seem to at least think of themselves as better off for going to these stadiums as opposed to somewhere else. It may also lend some support to Tiebout (1956) in that communities may actually want these stadiums, again because they feel they are better off for having them.

Finally, it is also important to point out that this paper has not been able to show that stadiums are to be considered sound financial investments. Merely, it has shed some further light on the idea that an increase in public utility may come from the building of a new stadium, similar to the increase seen if a

new park or zoo is constructed. It suggests to local governments who may be considering building a new stadium, that they must look beyond the numbers and see if a new stadium might be able to increase civic pride, public morale, or some other aspect of society. It also points to the idea that Cost/Benefit analysis which attempts to numerically value a new stadium project may not be enough. Cost/Benefit analysis may ignore a significant portion of the benefits and civic good the stadium can provide. This does not however mean that stadiums can now be considered sound investments. This is not the scope of the work. Merely, this research is pointing to the idea that more needs to be considered when deciding whether or not a stadium should be built.

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