

THE ECONOMIC IMPACT OF SPORTS STADIUMS: RECASTING THE ANALYSIS IN CONTEXT

CHARLES SANTO
Portland State University

ABSTRACT: *Independent empirical analyses are often used to refute assertions that sports stadiums can serve as economic catalysts. Criticisms of recent stadium investments, however, are commonly based on studies conducted with data that is out of date. Current generation stadiums typically exhibit a different character and purpose than the multi-use, utilitarian facilities built in the 1960s and 1970s. This study tests the importance of the new context within which stadiums are built by recasting a landmark study with current data. Nineteen metropolitan areas are included in a cross-section time-series analysis, representing every city that gained or lost an NFL or MLB team, or experienced a stadium construction for such a team between 1984 and 2001. These sports-related variables are found to be positively correlated with regional income share for eight of the nineteen metropolitan areas. A closer look at the findings suggests that context matters.*

Since 1990 over \$10 billion in public funds have been allocated for the construction of major league sports facilities across urban America (Rappaport & Wilkerson, 2001). Throughout this boom, subsidized stadiums have often been promoted as economic development tools or key elements of urban revitalization strategies. The emergence of this trend sparked the interest of economists who responded with a host of empirical research, much of which cast doubt on the validity of the stadium as an economic catalyst (Baade, 1996; Baade & Dye, 1990; Coates & Humphreys, 1999; Noll & Zimbalist, 1997; Zimbalist, 1998; Zimmerman, 1997).

As public spending on sports facilities continues into the twenty-first century the surrounding debate has escalated, and empirical findings formerly confined to the pages of academic journals have found their way into the mainstream media. With this increased attention, the nuanced results of numerous individual analyses have become synthesized into a broad message suitable for mass consumption. The following summary statement by Siegfried and Zimbalist (2000) illustrates how the findings of economic research regarding stadium investments are typically depicted:

Few fields of empirical economic research offer virtual unanimity of findings. Yet, independent work on the economic impact of stadiums and arenas has uniformly

**Direct Correspondence to: Charles Santo, School of Urban Studies & Planning, College of Urban and Public Affairs, Portland State University, P.O. Box 751-USP, Portland, OR 97207-0751. E-mail: santoca@pdx.edu*

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found that there is no statistically significant positive correlation between sports facility construction and economic development (p. 98).

Siegfried and Zimbalist declare the case closed, but this is a dangerous generalization that ignores the importance of context. Criticisms of recent stadium investments are often based on empirical analyses built on outdated data. Many of the stadiums built in recent years are constructed with a very different purpose than the multi-use, utilitarian facilities of the 1960s and 1970s. Sports facilities are now designed to serve as architectural symbols with tourist appeal and are often built into the urban fabric to facilitate synergy. This is in contrast to facilities of the previous generation, which were located near interstate exchanges to facilitate a quicker exit after the game.

This study offers new evidence that contradicts the general conclusion that sports facilities can have no significant positive impact on local economies. It begins with a review of two landmark empirical analyses that have contributed to this conclusion (Baade, 1996; Baade & Dye, 1990). New empirical research, derived from recasting the frequently cited study of Baade and Dye with current data, is reported. The findings of this research are supported by a closer examination of previously reported empirical analyses, which indicate that context plays a key role in determining the impact of sports development strategies.

THE EX POST FACTO STANDARD

While stadium promoters often use predictive input-output models to project a facility's economic impacts, the empirical research produced by economists and other critics is based on ex post facto evaluation. These studies typically use regression analysis and a combination of time-series and cross-section data to detect whether the presence of a sports team or facility significantly impacts statistics that represent the strength of a local economy.

Baade and Dye (1990) employed this approach in a study that has become a landmark reference for critics of stadium subsidies. Using two regression equations, the authors examine the effect of National Football League (NFL) teams, Major League Baseball (MLB) teams and new stadiums on metropolitan area income. The methodology is designed to provide a straightforward test of claims that sports-related spending and multiplier effects lead to increased area income. The analysis is based on data gathered from nine metropolitan areas (Cincinnati, Denver, Detroit, Kansas City, New Orleans, Pittsburgh, San Diego, Seattle, and Tampa) during the period of 1965 to 1983. Each of the metropolitan areas included in the sample either gained a new NFL or MLB team, or experienced the construction or renovation of a facility for an NFL or MLB team during the study period.

In the first equation, aggregate standard metropolitan statistical area (SMSA) income is regressed on three sports-related variables. These are dummy variables that indicate the presence of a new or renovated stadium, the presence of a football team, or the presence of a baseball team for each year in the time series. The dummy variables for football or baseball teams are omitted for cases in which there is no change in the presence of a team during the time period. SMSA population and a time trend variable are also included as control variables. The time trend variable is assigned a value of one for 1965 and increases to 19 for 1983.

The results this equation indicate a significant relationship between the sports-related variables and income levels for only one of the metropolitan areas. A new stadium in

conjunction with the presence of a new baseball team had a significant positive effect in Seattle. Baade and Dye also conducted an analysis of pooled data from all nine cities, which indicates a significant negative impact associated with the presence of a football team and a significant positive impact associated with the presence of a baseball. The authors draw few conclusions from these ambiguous results.

The second equation is designed to determine whether a metropolitan area gains a larger share of its region's income as a result of the presence of a sports team or stadium. The dependant variable for this equation is defined as SMSA income relative to regional income. The independent variables remain the same as those used in equation 1, except that population is replaced with SMSA population relative to regional population. Examining the statistics of each metropolitan area relative to its region provides an additional control for unspecified elements that could affect income levels.

Based on the findings of this model, Baade and Dye conclude that sports teams and facilities have a potentially negative impact on metropolitan area economies. The regression results indicate a significant negative correlation between the sports-related dummy variables and regional income share for five of the nine metropolitan areas. The stadium variable had a significant positive coefficient in New Orleans and Seattle, but the presence of a new stadium had a significant negative impact in Cincinnati, Detroit, Kansas City, and Seattle. The presence of a football team had a negative impact on regional income share in New Orleans. The pooled regression also shows a significant negative coefficient for the stadium variable. In all other instances the impact of teams or stadiums were not significant. Baade and Dye offer the following explanation of the negative impacts associated with the construction or renovation of stadiums:

Stadiums divert economic development toward labor-intensive, relatively low unskilled labor (low-wage) activities. To the extent that this developmental path diverges from less labor-intensive, more highly skilled (high-wage) activities characteristic of other economies within the region, it would be expected that the sports-minded area would experience a falling share of regional income (p. 12).

Baade conducted a similar analysis in 1996, again using time-series cross-section data. Forty-eight cities were examined over the period of 1958 through 1987. The sample included all cities that hosted a team from at least one of the four major sports, and 13 cities with no teams. A trend-adjusted measure of real per capita income was regressed on variables representing the number professional sports franchises and the number of new stadiums (less than 10 years old). As in Baade and Dye's earlier study, most of the results in this analysis were not statistically significant. The variable for number of teams was a statistically significant predictor of per capita income for only two cities: Baltimore, where it negatively affected per capita income, and Indianapolis, where a positive effect was found. The presence of a new stadium had a statistically significant negative impact on per capita income in Washington, DC, San Francisco, and St. Louis. For all other cities, and in the pooled regression, the team and stadium variables did not have a statistically significant impact on trend-adjusted per capita income.

RECASTING THE ANALYSIS

While these two studies are frequently cited to criticize stadium investments, they have been subject to criticism as well; the most notable of which is related to the time periods used in the analyses. Even in his 1996 study, the time series of Baade's analysis ended in 1987. This

precludes evidence from stadiums built during the stadium building boom of the 1990s and beyond, which many would argue are of a very different character than prior generation facilities. And although Baade and Dye (1990) conducted their research prior to this trend, their findings from a time series that ended in 1983 are commonly used to criticize today's stadium investments. (Other more recent studies have lumped old and new facilities together. A 1999 study by Coates and Humphreys included all major league sports facilities built between 1969 and 1994.) Chema (1996) expands on the distinction between eras of stadium design:

Baade has researched essentially non-urban facilities which were not intended to be economic development tools. The multi-use facilities that proliferated in the late 60s and early 70s were specifically designed to be apart from the city. The design characteristics give the impression more of a fort than a marketplace. Moreover, during the period surveyed most new venues were located in suburban or rural locations. The relatively few urban venues might as well have been in suburbs because they were separated from their host city by a moat of surface parking (p. 20).

In contrast, the recent wave of stadium construction has been marked by a migration of such facilities back to the urban core with an emphasis on revitalization and tourist appeal (Newsome & Comer, 2000). Recall that in his 1996 study, Baade found a positive relationship between sports teams and per capita income for Indianapolis. He ascribes this relationship to the fact that Indianapolis included sports as part of a larger development strategy in the 1970s and 1980s. While Indianapolis was the only city to utilize this strategy during the era that Baade studied, it is now far more common for cities to tie revitalization efforts to sports-related development.

Chema concludes, "it is not the sport activity, but the context which is key" (p. 20). Theoretically, a retro-style ballpark in a downtown or retail setting is likely to attract visitors from a wider area than its more utilitarian suburban counterpart, and is likely to induce longer stays and greater ancillary spending. If so, it is plausible that the new generation of sports facilities would have more favorable economic impacts than their predecessors.

To test this hypothesis, the cross-section time-series analysis designed by Baade and Dye is recast here with a more current set of data. To the extent that the methodology employed by Baade and Dye is accepted as sound, the new empirical evidence produced by this approach should be considered an equally valid update that reflects the current context of stadium investments.

RESEARCH DESIGN

The new analysis presented here essentially picks up where Baade and Dye left off, with a time period extending from 1984 to 2001. This research provides the most current cross-section time-series analysis of the economic impacts of professional sports teams and facilities. In contrast to other recent studies, this research focuses on the impact of current generation stadiums, excluding older facilities from the analysis. In a study critical of stadium investments, Coates and Humphreys (1999) conducted a cross-section time-series analysis that included data from 1969 to 1994. While this research does incorporate the impact of some current generation facilities, it does not distinguish those stadiums from ones built in the 1970s. If the context of current generation stadiums makes them a better investment than the utilitarian facilities of the previous era, then lumping the two groups together might cloud the analysis.

TABLE 1

Sample Metropolitan Areas

MSA	Baseball Team	Baseball Stadium	Football Team	Football Stadium
Atlanta		Turner Field 1997		Georgia Dome 1992
Baltimore		Oriole Park 1992	Ravens 1996	M&T Bank Stadium 1998
Charlotte			Panthers 1996*	Ericsson Stadium 1996
Chicago		US Cellular 1991		
Cleveland		Jacobs Field 1994	(Browns 1995) Browns 1999	Cleveland Stadium 1999
Denver	Rockies 1993	Coors Field 1995		
Fort Worth-Arlington		The Ballpark 1994		
Houston			(Oilers 1996)	
Jacksonville			Jaguars 1995	Alltel Stadium 1995 renovated
Los Angeles			(Raiders 1994)	
Miami	Marlins 1993			Pro Player Stadium 1987
Nashville			Titans 1999*	The Coliseum 1999
Oakland			Raiders 1995	
Orange Co. (Anaheim)		Edison Int'l Field 1999 renovated	(Rams 1994)	
Phoenix	Diamondbacks 1998	Bank One Ballpark 1998	Cardinals 1988	
St. Louis			(Cardinals 1987)	Edward Jones Dome 1995
Seattle		Safeco Field 1999		
Tampa	Devil Rays 1998	Tropicana Field 1998 renovated		Raymond James Stad. 1998
Washington, DC				Fed Ex Field 1997

Note. Franchise names in parentheses denote teams that left an MSA during the indicated year.

*The Carolina Panthers played at Memorial Stadium in Clemson, South Carolina in 1995. The Tennessee Titans played at the Liberty Bowl in Memphis in 1997 and at Vanderbilt Stadium in 1998.

Nineteen metropolitan statistical areas (MSA) are included in the analysis, representing every city that either experienced a change in the presence of an NFL or MLB team, or experienced a stadium construction or renovation for an NFL or MLB team during the time period. The number of cities included in this analysis is more than double that examined by Baade and Dye, although the period is one year shorter. This is illustrative of the difference between the two eras, reflecting increased stadium construction, team expansion, and relocation during the latter period. The larger sample size should also contribute to enhanced statistical reliability and validity for the pooled regressions. Table 1 lists the metropolitan areas included in this study and indicates the year in which each saw a change in the presence of a team or experienced the construction or renovation of a stadium. (Franchise names in parentheses denote teams that left an MSA during the indicated year.)

The research design used here contains two slight deviations from that employed by Baade and Dye, which enhance the utility of the study. The time period of this study saw a

significant amount of movement among NFL teams. To capture these effects, the analysis includes metropolitan areas that lost teams as well as those that attracted relocated teams or expansion franchises. The impact on a city's economy of losing a team should be as telling as that of gaining one. In addition, rather than using a single dummy variable for the presence of a new stadium, two unique variables are used to indicate either the presence of a new football stadium or the presence of a new baseball stadium. This specification allows the analysis to detect whether a baseball stadium has a different overall impact than a football stadium. It is also partly a matter of necessity since multi-purpose facilities are no longer built and four of the sample cities constructed or renovated separate stadiums for both sports during the study period.

With the exception of the unique football and baseball stadium variables, the two regression equations used in this analysis are identical to those employed by Baade and Dye, and are described below.

Equation 1:

$$Y_i = a_0 + \beta_1 \text{BSTAD}_i + \beta_2 \text{FSTAD}_i + \beta_3 \text{BASE} + \beta_4 \text{FOOT} \\ + \beta_5 \text{TREND} + \beta_6 \text{POP}_i + e_i$$

where,

- Y_i = the i^{th} MSA's real aggregate personal income (in 2001 dollars)
- POP_i = the i^{th} MSA's population
- $\text{BSTAD}_i = 0$ before the i^{th} MSA renovates or builds a baseball stadium; 1 after a stadium is renovated or built
- $\text{FSTAD}_i = 0$ before the i^{th} MSA renovates or builds a football stadium; 1 after a stadium is renovated or built
- $\text{BASE}_i = 0$ if an MLB team is not present in the i^{th} MSA; 1 if an MLB team is present
- $\text{FOOT}_i = 0$ if an NFL team is not present in the i^{th} MSA; 1 if an NFL team is present
- TREND = a variable assigned a value of 1 for 1984 and increasing to 18 for 2001
- e_i = error term

Equation 2:

$$Y_i/\text{YR}_i = a_0 + \beta_1 \text{BSTAD}_i + \beta_2 \text{FSTAD}_i + \beta_3 \text{BASE} + \beta_4 \text{FOOT} \\ + \beta_5 \text{TREND} + \beta_6 \text{POP}_i/\text{POPR}_i + e_i$$

where,

- Y_i/YR_i = the i^{th} MSA's real aggregate personal income as a fraction of the i^{th} region's income
- $\text{POP}_i/\text{POPR}_i$ = the i^{th} MSA's population as a fraction of the i^{th} region's population

Income and population data, including regional data, are taken from the Bureau of Economic Analysis (BEA) (n.d.). Calculations for the regional share variables used in Equation 2 are based on BEA-defined regions (New England, Mideast, Great Lakes, Plains, Southeast, Southwest, Rocky Mountain, and Far West). Aggregate income figures have been converted to 2001 dollars using consumer price index conversion factors published by the Federal Reserve Bank.

TABLE 2
Equation One Results

MSA	Pop	Trend	BSTAD	FSTAD	BASE	FOOT	R-square
Atlanta	78.13**	-3,219,298**	1,777,076	-3,787,657*			0.996
	6.73	-2.95	0.76	-2.06			
Baltimore	50.77	594,527	-4,787,847**	3,330,034**		1,709,893	0.979
	1.18	0.58	-3.22	2.11		0.84	
Charlotte	46.29**	8,630		1,071,831		#	0.992
	3.06	0.02		1.03			
Chicago	32.79**	5,310,800**	-15,812,199**				0.992
	2.81	6.01	-5.09				
Cleveland	-56.39**	771,259**	1,172,395	1,256,781		-1,032,980	0.982
	-3.72	10.31	1.38	1.51		-1.58	
Denver	89.42**	-405,637	-831,040				0.994
	9.62	-1.38	-0.49				
Fort Worth-Arlington	86.95**	-1,571,095**	932,767		-5,882,092**		0.978
	4.83	-2.54	0.44		-3.74		
Houston	44.15**	274,669					0.993
	5.20	0.53					
Jacksonville	4.26	669,971		1,368,767**		#	0.982
	0.13	1.04		2.23			
Los Angeles	98.62**	-6,494,622*					0.925
	3.26	-1.96					
Miami	-22.98	2,089,532					0.919
	-0.33	0.87					
Nashville	24.65	813,385					0.894
	0.37	0.56					
Oakland	114.58**	-2,063,453					0.967
	2.28	-1.17					
Orange Co. (Anahiem)	133.05**	-2,679,828*	7,225,047**				0.994
	3.97	-1.77	4.60				
Phoenix	56.84**	-2,627,994**	4,555,841**				0.995
	5.10	-2.43	3.06				
St. Louis	-10.44	1,354,480					0.970
	-0.11	1.24					
				1,116,316	#	663,492	0.48
				0.44			

TABLE 2 (Continued)

Seattle	25.59	1,527,690	10,096,357**	4.18				0.984
	0.81	1.07						
Tampa	55.53**	-513,499	2,035,197**	4.38	2,035,197**	#		0.987
	2.29	-0.61			4.38			
Washington, DC	150.21**	-6,702,802**			10,259,852**			0.997
	12.22	-7.45			7.72			
POOLED	44.25**	531,175**	4,619,880**	3.85	1,321,021	-8,126,238**	-254,955	0.993
	20.72	4.16			0.99	-4.93	-2.50	

Coefficients are listed above t-scores.

**indicates significance at $p < .05$ *indicates significance at $p < .10$.

#indicates stadium contemporaneous with franchise.

RESULTS

Equation 1 examines the impact of sports-related variables on aggregate MSA income. As summarized in Table 2, the results are mixed. Controlling for population and time trend, sports teams and stadiums are positively related to income in some metropolitan areas and negatively related in others. For example, the coefficient for the baseball stadium variable is significant and positive for Anaheim, Phoenix, Seattle, and Tampa, but significant and negative for Baltimore and Chicago. New football stadiums seem to have a significant positive impact on income in Baltimore, Jacksonville, Nashville, Tampa, and Washington, DC, but the Georgia Dome is shown to have a significant negative impact in Atlanta. The effects associated with the presences of baseball and football teams are equally mixed.

To test the overall impacts of the sports-related variables on MSA income, data from all 19 areas were pooled. The same regression equation was used, with the addition of dummy variables for 18 of the 19 areas to control for differences in the scale of income levels across the areas. The results of the pooled analysis indicate that new baseball stadiums have a significant positive impact on area income, while the presence of a baseball team has a significant negative impact. The coefficients for the other two dummy variables are not significant for the pooled analysis.

Because of the mixed results, it is difficult to draw any clear conclusion from this first set of regressions. Furthermore, a closer examination of the data reveals a potential flaw in the design of Equation 1. Despite the inclusion of the population and time trend variables, this model seems unable to control for unobserved influences on the dependant variable outside of any changes in the sports landscape. In particular, with the dependant variable specified as aggregate MSA income, the control variables used cannot account for the impact of the national recession of the early 1990s.

Chicago, Baltimore, Atlanta, and Denver provide examples of this flaw. Chicago and Baltimore built new baseball stadiums in 1991 and 1992 respectively. Atlanta built a new

TABLE 3

National Income Trends

Year	% Change in Personal Income
1985	3.6
1986	3.8
1987	3.0
1988	3.6
1989	2.7
1990	1.1
1991	-0.5
1992	3.0
1993	1.1
1994	2.4
1995	2.4
1996	2.6
1997	3.6
1998	5.4
1999	2.6
2000	4.5
2001	0.5

football stadium in 1992, and Denver landed an expansion baseball team in 1993. As Table 3 indicates, national income growth was slow or stagnant between 1990 and 1993. Because changes in sports-related variables coincided with slow or stagnant income growth in these cities, the results of Equation 1 indicate a relationship between the two. However, it is plausible that unobserved determinants related to the recession had a more direct impact on area income levels.

In addition, in every case where the sports-related variables were found to have a significant positive impact on aggregate area income, the related stadium construction or change in team location occurred in the late 1990s, during a time of nationwide economic prosperity. Here it is possible that unobserved influences associated with the surging national economy exerted a more direct impact on area income than did sports-related changes. In addition to the shortcomings illustrated above, potential collinearity between the control variables population and time trend creates a problem.

The transformations used to generate Equation 2 adequately address the design issues raised above. By redefining the dependant variable as MSA share of regional income, this

TABLE 4**Equation Two Results**

MSA	Pop/PopR	Trend	BSTAD	FSTAD	BASE	FOOT	R-Square
Atlanta	3.17** 7.16	-0.0018** -4.58	0.0012* 2.00	0.0008 1.29			0.9930
Baltimore	0.23 0.70	0.00002 0.23	-0.0005 -1.43	0.0004 1.11		0.0001 0.15	0.5430
Charlotte	1.35** 3.35	0.00004 0.52		0.0001 0.46		#	0.9860
Chicago	0.28 0.54	0.0011** 3.23	-0.0018 -1.11				0.9340
Cleveland	-2.13* -1.87	-0.0009** -2.78	-0.0007 -1.66	-0.0015** -2.95		0.0008* 2.00	0.9810
Denver	3.64** 6.55	-0.0008* -2.00	0.0099** 3.78		0.0001 0.03		0.9210
Fort Worth-Arlington	0.99** 8.70	0.00004 0.73	-0.0008* -2.00				0.9580
Houston	2.02** 5.87	0.0009** 5.89				-0.0021 -1.15	0.9480
Jacksonville	0.85** 3.55	0.0000 -1.29		0.0004** 2.57		#	0.8880
Los Angeles	1.09** 3.66	-0.0009 -1.60				0.0013 0.68	0.9860
Miami	-0.03 -0.02	-0.0003 -1.43		-0.0003 -0.17	0.0001 0.04		0.7350
Nashville	4.99 1.52	-0.0016** -4.30		0.0030** 2.80		#	0.9580
Oakland	2.47** 4.60	0.0005** 4.43				0.0004 0.58	0.8060
Orange Co. (Anahiem)	1.94** 3.09	-0.00001 -0.12	-0.0007 -0.69			0.0027** 2.39	0.7730
Phoenix	3.28** 11.16	-0.0040** -7.97	0.0001 0.07		#	-0.0002 -0.21	0.9830
St. Louis	1.29** 3.97	0.00001 0.06		0.0000 -1.58		-0.0017 -0.01	0.9440

Seattle	4.26**	0.0002	0.0031**				0.9850
	4.67	1.24	3.60				
Tampa	0.74**	-0.0001**	0.0004**	0.0004**	#		0.4150
	2.72	-2.86	2.33	2.33			
Washington, DC	1.57**	-0.0005		0.0009			0.9830
	5.56	-1.62		1.04			
POOLED	1.33**	-0.0001	0.0022**	-0.0008	-0.0011	-0.0006	0.9980
	24.94	-0.79	2.93	-0.54	-1.63	-1.44	

Note. Coefficients are listed above t-scores.
 #Indicates stadium contemporaneous with franchise.
 *p < .10. **p < .05.

model is able to inherently account for regional and national income trends, like those that affect the results of Equation 1. The population variable is also redefined as regional population share, which resolves potential issues of collinearity among control variables. With these improvements, Equation 2 is likely to produce more valid results.

The results produced by this model with current data are not consistent with the conclusions drawn by Baade and Dye in their original study. This new analysis indicates a significant positive relationship between sports-related variables and regional income share for eight metropolitan areas (Atlanta, Cleveland, Denver, Jacksonville, Nashville, Seattle, and Tampa). These findings are summarized in Table 4. After controlling for time trend and regional population share, the presence of a new baseball stadium is found to have a significant positive impact on regional income share for Atlanta, Denver, Seattle, and Tampa. The impact of football stadium construction or renovation is significant and positive in Jacksonville, Nashville, and Tampa. The presence of a football team shows a significant positive effect on income share for Cleveland and Anaheim. Significant negative coefficients are associated with the presence of a new baseball stadium in Arlington and the presence of a new football stadium in Cleveland.

The results of the pooled regression indicate that the presence of a new baseball stadium has a significant positive impact on regional income share. The other sports-related variables are not significant predictors of regional income share in the pooled analysis. Using unique dummy variables for the presence of football or baseball facilities allows the analyses to distinguish the impacts of each. Baseball facilities host ten times as many home games as football stadiums, and are, therefore, likely to create more economic activity, as these results indicate. None of the cities included in the original study by Baade and Dye built baseball-only facilities during the time period of their study. The results indicate a significant positive correlation between new baseball stadiums and income, but the coefficient for the baseball team variable is not significant. This seems to support the theory that even in cities where teams already play, new stadiums themselves are economic generators, perhaps due to the context of revitalization and tourist appeal in which such facilities are now built. (An alternate explanation focuses on the coefficient associated with the baseball team variable, which is negative and just outside the range of significance. Coates and Humphreys [1999] find evidence that some sports franchises reduce the level per capita income growth. They surmise that this may reflect a compensating differential effect; people might be willing to accept lower wages, all else being equal, in exchange for the amenities associated with professional sports. It may be that the compensating differential effect is associated with the presence of the team, while the stadium is able to generate economic benefits by exporting sports-related activities to visitors from outside the area.)

The evidence presented here is contradictory to the findings of Baade and Dye as well as the general sentiment of other empirical analyses as synthesized by critics of stadium investments. However, instead of offering broad conclusions on the economic merits of sports facilities, it is more useful to examine the context in which sports related variables show a significant impact, because the importance of context is the impetus for this study.

For example, facility location seems to affect the success of stadium investments. The results indicate six cities for which the presence of a new football or baseball stadium is positively correlated with regional income share (Atlanta, Denver, Jacksonville, Seattle, and Tampa). In each of these cases the stadiums in question are set in a downtown or central city environment (Newsome & Comer, 2000). In contrast, The Ballpark in Arlington, set in a suburban location, is one of two new facilities shown to have a significant negative impact on regional income share. Cleveland Stadium is also shown to have a negative impact, but this is offset by the significant positive coefficient associated with the football team that the facility hosts.

Cities that attracted new teams during the study period also seemed to fair particularly well. In Tampa the renovation of Tropicana Field, in conjunction with the arrival of the expansion Devil Rays, shows a significant positive impact on regional income share. The construction of Coors field, built to host the expansion Rockies, shows a significant positive impact in Denver. The new football stadium variable has a significant positive correlation with regional income share in Jacksonville and Nashville, where facilities were built or renovated to host new teams. The presence of a football team has a significant positive impact in Cleveland, which lost the Browns to Baltimore in 1995, but gained an expansion team in 1999. The coefficient of the football team variable is also significant and positive for Anaheim. (Anaheim has not had an NFL franchise since the Rams relocated to St. Louis in 1994.)

It would be a mistake to simply conclude from these findings that sports facilities represent wise investments for localities. The analysis does not speak to the efficiency of such spending, nor does it consider the related opportunity costs. In addition, the positive coefficients are not very large; however, the findings do conflict with the broadly accepted generalization that sports facilities have insignificant or negative impacts on metropolitan area economies. Instead, this analysis supports the claim that context matters. The results indicate that new stadiums in downtown settings are potentially beneficial, as are stadiums built to host new teams. Conventional logic supports both of these conclusions. Stadiums set in downtown locations are more likely to generate ancillary spending before and after games than their suburban counterparts. A city that gains a new team is likely to attract an increased number of visitors from within its region. A realignment of leisure spending within the region could result in a larger share of regional income for the city with the new team. A new team might also generate some economic benefit through import substitution if it causes local residents to spend money inside the local economy that they would have otherwise spent elsewhere. For example, a family might decide to forgo a weekend trip in order to take in a local baseball game.

An alternative explanation for the conflicting results of the original and current studies should also be noted. It is possible that the incongruous findings are simply the result of inherent limitations in the original methodology rather than changes in the character of stadium investments. For instance, variables representing the construction of a new stadium or the gain or loss of a team are treated as exogenous, which assumes that they are not inherently tied to overall economic performance. It could be argued that teams choose to move to "booming" cities, meaning that economic growth influences team location. This might produce biased findings of a positive relationship between the presence of a team and regional income share. (It is more difficult to

make the case that economic growth influences stadium building decisions. In fact, cities facing economic decline or stagnation seem more likely to invest in new stadiums than do prosperous localities.) Bias might also exist due to omitted variables; factors not accounted for in the model that occurred simultaneous to changes in the sports-related variables could have also impacted metropolitan income levels. Consider the findings for Atlanta. Equation 2 indicates a positive relationship between the construction of a baseball stadium and regional income share. However, what is now Turner Field was originally built to host events for the 1996 summer Olympic games and converted to serve as the Braves' home park before the following season. Part of the positive impact attributed to the construction of the baseball stadium is likely the result of Atlanta hosting the Olympic games.

Concluding that the methodology is flawed would indicate that the results of the original Baade and Dye study are also biased, and are, therefore, a poor foundation for arguments in opposition to stadium investments. To the extent that the methodology employed by Baade and Dye is accepted as sound, the new empirical evidence presented here provides an equally valid update that reflects the current context of stadium investments. Additional evidence, as presented below, supports the contention that context matters and that the character of stadium investments has changed.

Supporting Evidence

It is commonly held that independent empirical research has found no evidence of economic benefits related to sports facilities. The results presented here are to the contrary, but this research is not the only incidence of such evidence. The findings of Nelson's (2001) cross-section time series analysis support the notion that context matters. Nelson examined data from 43 MSAs over the period of 1969 to 1994. MSA share of state per capita income is regressed on variables that represent the number of teams present and the locations in which they play. A set of control variables designed to represent characteristics of each MSA's population, labor force, and economic structure is also used. Nelson finds that the association between the number of teams playing in the central business district (CBD) and share of state per capita income is positive, but just out of range of being statistically significant. The association with teams playing outside the CBD is negative and statistically significant. Nelson also finds evidence of agglomeration effects, noting that the coefficient associated with multiple teams playing in the CBD is significant and positive.

The city-specific case studies of Austrian and Rosentraub provide additional evidence of the importance context (1997, 2002). Austrian and Rosentraub (1997) assess the micro-level impacts of sports development in Cleveland. The Gund Arena and Jacobs Field (elements of a series of capital projects known as the Gateway Complex) both opened in 1994 with an estimated total cost of \$467 million. The authors examine the effect of this substantial investment on development and job creation in the surrounding downtown area. The study shows that following the construction of the sports facilities real wages per employee increased in the Gateway area, with a growth rate higher than that of the county and metropolitan area. This excluded player salaries. The authors also find an increase in sports-related jobs for the area following construction. These jobs include those in general merchandise stores, apparel and accessory stores, eating and drinking establishments, hotels and motels, and amusement and recreation firms. Employment in these industries increased by 22.6% between 1992 and 1995. The study area also experienced a net increase in the number of businesses established. While the authors are critical of the cost per job

created during the study period they do not condemn the city's stadium investment strategy. This strategy may or may not have impacted Cleveland's overall income level, but it clearly had positive micro-level impacts.

Austrian and Rosentraub (2002) examine the ability of stadium investment strategies to impact urban revitalization. The authors make an important distinction between such impacts and impacts on overall economic activity:

If the justification for using public resources to build downtown sports facilities is that these structures will shift economic activity to an area that that needs redevelopment, then the issue is not whether overall economic activity increased or decreased, but whether the vitality or centrality of the downtown area was enhanced or sustained (p. 551).

Their approach calls into question the focus of more general cross-section analyses. Austrian and Rosentraub investigate development patterns in four metropolitan areas: Cincinnati, Cleveland, Columbus (Ohio), and Indianapolis. These Midwestern cities have each faced similar struggles related to the migration of population and economic activity to suburban localities. Cleveland and Indianapolis both employed sports development strategies in efforts to revive struggling downtown areas, while Cincinnati and Columbus did not invest in such facilities until very recently. Austrian and Rosentraub present evidence that Cleveland and Indianapolis benefited from their early investment in downtown sports facilities, while Cincinnati and Columbus have continued to struggle. During their study period both Cleveland and Indianapolis saw an increase in the number of downtown jobs. Cleveland's downtown jobs increased despite a continued population loss and a slow regional growth rate. In contrast, the number of downtown jobs in Cincinnati steadily decreased during the study period and Columbus lost downtown jobs despite a growth rate in regional jobs exceeding the national growth rate. Austrian and Rosentraub conclude, "sports and a hospitality concentration did help focus economic attention and political support for the maintenance of a downtown presence for employers in both Cleveland and Indianapolis" (p. 560).

CONCLUSION

Case studies like those conducted by Austrian and Rosentraub, which focus on one or a few cities, are able to inherently account for the context in which sports facilities are built. This focus is important because, as has been illustrated above, a facility's ability to impact its local economy is tied to its context. This point can be overlooked in the analysis and reporting of cross-section time-series research. In addition, when the results of numerous empirical analyses are synthesized into broad conclusions, the nuances of individual findings are eroded.

The broad interpretation of independent economic research regarding sports stadiums is that empirical evidence cannot support a positive relationship between such facilities and economic development. According to many, the case appears to be closed. This study reports new evidence, derived from recasting the landmark study of Baade and Dye with current data, which contradicts this conclusion. The intent of this research is not to criticize the findings of Baade and Dye, *per se*, but to question the use of findings based on stadiums from a past era to criticize the stadium investments of today. The stadiums of the recent construction boom have been built amidst a very different context than those of the previous generation. The new findings reported here, along with a closer examination of previous analyses indicate that context matters.

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