PROFESSIONAL SPORTS AS CATALYSTS FOR METROPOLITAN ECONOMIC DEVELOPMENT

ROBERT A. BAADE*
Lake Forest College

ABSTRACT: Cities throughout the United States are facing an unprecedented number of threats from the professional sport teams they host to build new playing facilities or lose the franchise. The recent moves of NFL teams from Los Angeles, Cleveland, and Houston to St. Louis, Oakland, Baltimore, and Nashville, respectively, have given currency to these threats. To attract or retain a team, cities are offering staggering financial support and rationalize their largesse on economic grounds. Do professional sports increase income and create jobs in amounts that justify the behavior of cities? The evidence detailed in this paper fails to support such a rationale. The primary beneficiaries of subsidies are the owners and players, not the taxpaying public.

The stadium and arena construction business is booming in cities throughout the United States. The Ballpark in Arlington, Camden Yards in Baltimore, Comiskey Park II and the United Center in Chicago, Jacobs Field and Gateway Arena in Cleveland, and Coors Field in Denver represent a sample of cities in which stadiums have been built in the 1990s to replace facilities judged obsolete. Seattle, Houston, Cincinnati, and Milwaukee represent a relatively small sample of other established Major League cities that are planning new facilities for some of their teams. Because even modest sports facilities generally cost more than $100 million, taxpayers are source for billions of dollars for professional sports infrastructure.

* Direct all correspondence to: Robert A. Baade, Department of Economics and Business, Lake Forest College, 555 N. Sheridan Rd., Lake Forest, IL 60045-2399.
To ease taxpayer pain, cities have rationalized the stadium spending spree on investment grounds. Taxpayers are told that professional sports stadiums and teams enrich rather than deplete local treasuries and that paying for professional sports now will mitigate future tax burdens by stimulating local job creation and incomes. In trying to convince Jacksonville, Florida, taxpayers that a National Football League (NFL) expansion team was a worthy investment, the team ownership group contended that their NFL entry would pump $130 million a year into the local economy and create 3,000 jobs (Norton, 1993).

Are sports facilities and teams a gaggle of geese that lay golden eggs? The purpose of this paper is to evaluate the promise that professional sports increase income and jobs in the metropolitan areas hosting teams. This paper proposes a methodology through which estimates of stadium economic impact generated by the gross expenditure and economic multiplier approach, common to the economic impact studies commissioned by teams and cities, can be filtered. The statistical evidence gathered through this study indicates that professional sports as a golden goose ranks among the most enduring and greatest sports myths.

**ROLE OF THIS RESEARCH**

Research assessing the economic impact that professional sports teams and stadiums have on city economies has proliferated. With increasing frequency, scholars have disputed the substantial benefits promised for cities by advocates of professional sports subsidies. Despite mounting independent evidence to the contrary, optimistic appraisals of sports economic potential for host cities persist. For example, in supporting the use of public funds for a retractable dome stadium in Phoenix, one consulting firm projected an annual increase of economic output or income of $162 and $230 million for the City of Phoenix and the State of Arizona, respectively (Deloitte & Touche, 1993).

Benjamin Okner (1974) was one of the first to take issue with the notion that professional sports can boost an area's economy. Okner concluded that owners and players primarily benefit economically from the civic largesse directed at sports.

More recent research has confirmed that professional sports subsidies do little for the communities that provide them. Rosentraub, Swindell, Przybylski, Mullins (1994, p.236) concluded that downtown Indianapolis failed to benefit significantly from substantial investment in sports infrastructure. They observed:

Indianapolis, more than any other city, developed an articulated economic development strategy for its downtown which emphasized amateur and professional sports. This policy was designed to rebuild the core area and avoid a doughnut pattern of prospering areas along an outer beltway surrounding a deteriorating center....

While there were important achievements which should be attributed to Indianapolis's sports strategy, on balance it seems fair to conclude there were no significant or substantial shifts in economic development.

Rosentraub's finding is significant and timely because it directly confronts the microarea (neighborhood) rationale for stadium subsidies. City officials in Cleveland, Baltimore, and
Houston have argued for stadium subsidies on the grounds that sports facilities can revitalize a deteriorating downtown or urban core.

Rosentraub's findings conform to theory and common sense. Stadiums attract funds from outside the facility's neighborhood, but most of the money is quickly dispersed beyond the stadium's environs. Owners, players, and others who conduct stadium commerce do not generally spend stadium proceeds in the facility's immediate neighborhood. In addition, while stadium patrons spend some money on locally produced goods and services, the new genre of stadiums is economically ambitious in ways that frustrate rather than encourage neighborhood economic development. New stadiums provide a staggering array of goods and services ranging from a variety of culinary options and souvenirs to child care. In its efforts to mine every conceivable and meaningful source of revenue, the contemporary sports stadium provides services and appropriates revenues previously reserved for neighborhood commercial entities.

Further, because the life of the events stadiums and arenas host is defined in terms of hours, even the most frequently used facilities, those hosting multiple teams and events, remain unused much of the time. To encourage attendance, facilities require abundant parking nearby (this is particularly true in blighted areas that are perceived as unsafe) and automobile accommodation serves to increase the amount of dead time the stadium and its environs experience. Sustained and expanded neighborhood economic development in a depressed area requires more than a part-time business presence and far greater reclamation than that provided by a stadium.

In light of trends toward economically aggressive stadiums, the uncertainty with regard to where stadium revenues are respent, and the increasingly important role played by county and state governments in subsidizing stadiums, a sports facility's economic impact should be evaluated at the metropolitan or macroarea level as well as at the neighborhood level. While there is no guarantee that the spending that occurs in conjunction with stadium activities stays within the metropolitan economy, it is axiomatic that the size of the multiplier expands in proportion to the size of the urban economy analyzed.

Theoretically, it is possible that the metropolitan or macroarea economy, as well as the local economy, fails to benefit from a stadium. Indeed, if all the players, owners, concessionaires, etc., repatriate stadium proceeds to residences and businesses outside the metropolis, the "leakiest case" scenario, it is conceivable that the metropolitan economy could be harmed rather than enhanced by the stadium and the team.

To date, scholarly analysis of the macrolevel economic impact a stadium and team has on a Metropolitan Statistical Area (MSA) has not revealed a net economic drain or significant gains for most metropolitan areas. Research by Baade (1994), Baade and Dye (1988, 1990), Quirk (1987), Quirk and Fort (1992), Bain (1990, 1992), Euchner (1993), and Greco (1993) generally have concluded that professional sport has had a negligible impact on metropolitan economies.

The persistence of team and city-commissioned studies claiming substantial stadium-induced economic development compels more extensive research on the economic impact of professional sports. This research expands past scholarship on the economic impact of stadiums and teams at the MSA level, particularly as it relates to job creation. The model used in this study is not designed to assess microlevel economic impact and, therefore, should be viewed as a complement to microarea research.
One further qualification is in order. This research concentrates exclusively on economic development either directly or indirectly induced by sports. This focus is compelled by the emphasis on an economic rationale by those who champion public funding of professional sports. Given the model’s construct, any substantial economic stimulus induced by professional sports, to include business relocation, increased city coalescence around a sports theme, and enhanced image, should be detected if it alters the city’s pattern of growth relative to other urban areas. Gradual changes, however, in growth are not likely to surface as statistically significant for any one year and will not be detected by the model. This lends a decidedly short-term character to the model. No attempt has been made in this research to measure the psychic benefits (or costs) often associated with sports. If pro sports provides negligible economic benefit to the host community, then the subsidy debate should properly be moved to the psychological arena.

**DIRECT AND INDIRECT EXPENDITURES**

To my knowledge no analyst has projected stadium direct revenues in excess of all explicit stadium costs to include debt service. In part, this explains the paucity of stadiums funded exclusively by the private sector.

Rationalizing public subsidies for stadiums requires an identification of benefits appro-priable by the public sector in excess of public subsidies (costs). Economic multipliers play a crucial role in rationalizing subsidies. The initial in-stadium and out-of-stadium spending associated with the commercial sporting event is presumed to create considerable secondary or indirect spending. The pyramid of economic benefit defined by a multiple of direct expenditures is generally used to justify the public subsidy for a stadium.

The U.S. Department of Commerce estimates economic multipliers for each state and select geographic areas. For large metropolitan areas, the Department of Commerce generally estimates an amusement industry multiplier of approximately two. The diversification of the area’s economy and the area’s geography, to include its boundaries and size, establishes the multiplier’s value.

Several statistics offer guidance in assessing the direct impact and, therefore, potential overall economic impact a stadium will have on a metropolitan economy. As a first step, con-

**TABLE 1**

<table>
<thead>
<tr>
<th>City</th>
<th>1982 City Capital Expenditures</th>
<th>A $100 Million Stadium Outlay as a % of Total City Capital Outlay Spread over Construction Periods of 1, 2, or 3 Yrs.</th>
<th>A $100 Million Stadium Expense/ Capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>City</td>
<td>Total (Mil $s)</td>
<td>Per Capita</td>
<td>1 year</td>
</tr>
<tr>
<td>Chicago</td>
<td>$1,072.20</td>
<td>$150</td>
<td>9.3%</td>
</tr>
<tr>
<td>Indianapolis</td>
<td>154.86</td>
<td>131</td>
<td>64.5%</td>
</tr>
<tr>
<td>Minneapolis</td>
<td>505.54</td>
<td>233</td>
<td>19.8%</td>
</tr>
<tr>
<td>New York</td>
<td>1,615.50</td>
<td>177</td>
<td>6.2%</td>
</tr>
</tbody>
</table>

TABLE 2


<table>
<thead>
<tr>
<th>Standard Industrialization Classification (SIC)</th>
<th>Receipts ($1000)</th>
<th>Annual Paid ($1000)</th>
<th>Payroll Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>70-89 (Services Rendered)</td>
<td>20,325,014</td>
<td>8,015,936</td>
<td>279,373</td>
</tr>
<tr>
<td>79 except 792, 793, 7984 (Amusement and Recreation Services)</td>
<td>397,614</td>
<td>188,307</td>
<td>6,072</td>
</tr>
<tr>
<td>794 (Commercial Sports)</td>
<td>153,666</td>
<td>128,470</td>
<td>1,223</td>
</tr>
<tr>
<td>79 as a % of 70-89</td>
<td>1.96%</td>
<td>2.35%</td>
<td>2.17%</td>
</tr>
<tr>
<td>794 as a % of 70-89</td>
<td>.76%</td>
<td>1.60%</td>
<td>.04%</td>
</tr>
</tbody>
</table>


consider the fraction of a city’s capital budget constituted by a stadium investment. In Table 1 data for selected cities are summarized on the fraction of total city capital outlays constituted by each $100 million worth of stadium investment.

Although the data are for 1982, assuming the capital budget for cities and stadium construction costs have grown by a similar percentage, at least one conclusion can be drawn. Both in relative and absolute terms, a stadium represents a substantial investment for even the largest cities. As data in Table 1 indicate, however, the relative sacrifice will be inversely related to city population and annual city capital outlays. Naturally, a decision to subsidize a stadium means either a delay or a reduction in other city capital projects or an increase in total outlays and tax burdens, at least in the short term.

Of course, the extent to which the stadium expands the tax base determines the ability of the public to shoulder the additional tax burden. The fraction of a municipal economy constituted by the commercial sports sector (Standard Industrial Classification 794) suggests a facility’s potential for contributing to an economy. Consider the information recorded in Table 2 for Chicago’s economy as it relates to commercial sport.

As the information recorded in Table 2 indicates, commercial sports accounted for less than 1% of services income for Chicago in 1992 and this is for a city with five professional sport teams. Even if all entertainment income was generated in conjunction with the use of Chicago’s stadiums and arenas, less than 2.0% of services income could be attributable to Chicago’s sports facilities. Furthermore, service receipts accounted for approximately 31.22% of the payroll in Cook County in 1992 (U.S. Department of Commerce, 1994b). Should this statistic hold for the City of Chicago, commercial sports (794) and amusement and recreation (79) account for approximately .24 and .61 of 1%, respectively, of Chicago’s personal income.

Further, while service receipts per capita for Chicago with a population of 2.768 million (Statistical abstract of the United States, 1994) equalled $7,342.85, amusement and recreation and commercial sports receipts per capita approximated $143.64 and $55.52, respectively. Professional sports account for approximately only 39% of commercial sports receipts overall (U.S. Department of Commerce, 1994b). Only a relatively small
fraction of these per capita figures originates through the activities of a single professional sports franchise for which a stadium is constructed. Combining statistics, the professional sports industry in total provides roughly $22 on average for each citizen of Chicago.

Given these statistics, it is not surprising that a Chicago citizen who did not probe beyond direct commercial sports expenditures would have been critical of various government subsidies totaling more than $150 million for the construction of Comiskey Park II. To truly evaluate the economic contribution of professional sports to Chicago, however, and the wisdom of sports subsidies requires estimation of sports-induced changes in expenditures overall to include indirect expenditures. Prior to estimating the dollar value of sports-induced changes in direct and indirect spending, it is logical to determine first if the spending changes overall are significantly different from zero.

In addition, any analysis of the impact a stadium or professional sport team has on an economy would not be complete without considering the opportunities a city forgoes by subsidizing the team. The question should not be whether a new stadium would have any net impact on area development, but rather if it has the largest impact on the area from the set of alternative development projects.

Because a stadium may change the structure of the local economy, the long-run impact is not necessarily amenable to prediction with the direct expenditure-multiplier approach. Indeed, when opportunity cost is included, stadium costs may well exceed benefits. The types of jobs induced by stadium activity are low wage and seasonal: ticket takers, ushers, vendors, restaurant and bar workers, taxi drivers, etc. An area development strategy which concentrates on these types of jobs could lead to a situation where the city gains a comparative advantage in unskilled and seasonal labor.

To summarize, it is conceivable that the economic outcome of public subsidies for professional sports may differ substantially from the benefits projected by their advocates. Given the cost to a city of building or refurbishing a stadium or attracting or retaining a team, the economic impact of professional sport requires empirical examination. To supplement and to facilitate an evaluation of sport impact studies, a method for conducting after-the-fact audits of the contributions of professional sports to metropolitan economies would help advance the stadium subsidies debate.

The technique for performing such an evaluation should be designed to serve at least two functions. First, the model must provide evidence on whether sport induces increased economic activity or simply realigns it within the metropolitan area. Second, the model must to provide evidence on the efficacy of a sports development strategy (or for that matter the economic wisdom of building a stadium to placate an owner who threatens to move the franchise) relative to some alternative means for inspiring growth. The manner through which these demands are met by the models employed in this study are discussed next.

THE MODELS

The economic impact of professional sports on city economies usually involves estimates of increased income or jobs. As indicated earlier, the term city in this analysis refers to the MSA. To estimate the effect a new stadium or team has on metropolitan income, Eq. 1 was used. To better understand empirical results derived from Eq. 1 and to assess the effect a new stadium or team has on jobs, Eq. 2 was used.
Professional Sports and Metropolitan Economics

(1) \( \left( y_{i,t} - \sum_{j=1}^{k} y_{j,t} / k \right) - \left( y_{i,t-1} - \sum_{j=1}^{k} y_{j,t-1} / k \right) = \beta_0 + \beta_1 NT_{i,t} + \beta_2 NS_{i,t} + e_t, \)

where, \( y_{i,t} \) = real per capita income in city \( i \) at time \( t \),
\( k \) = number of cities in the sample,
\( n \) = number of years in the sample,
\( NS_{i,t} \) = number of stadiums less than 10 years old in city \( i \) at time \( t \),
\( NT_{i,t} \) = number of professional sports franchises,
\( e_t \) = stochastic error.

Operationally, Eq. 1 allows for an estimation of the extent to which a change in a city’s real per capita income, adjusted for trends in economic activity, correlates with a change either in the number of new stadiums or professional sport franchises a city acquires. In other words, the model was specified to evaluate the extent to which a change in the character of a city’s professional sports industry altered a city’s real per capita income growth relative to other cities in which no change in the professional sports industry occurred. To this end, particular care has been taken in the design of the dependent variable to facilitate a comparison of economic growth in cities that have experienced some change in their professional sports landscape to those that have not.

The trend-adjusted specification of the dependent variable is one method for preventing a netting out of the economic impact induced by changes in the professional sports environment. Because few cities in the sample experienced a change in their professional sports industries concurrently, subtracting the average growth rate of all cities in the sample from an individual city growth rate (city growth adjusted for national trends) ensures that professional sports’ economic contribution is not netted out. An example of the type of question this model is designed to address is as follows: If a city without professional sports adopts a team, does its rate of economic growth more closely approximate that which characterizes cities that have a professional sports presence?

First differencing the dependent variable in the manner described factors out (accounts for) some changes in the pattern of growth attributable to demographic changes, business cycle effects, and the induced effects of tax changes or revenue sharing at both the national level and the city level. At the very least this approach factors out those elements common to the urban US experience and those things which account for a particular city’s economic growth path. If unusually robust growth is experienced, does that performance correlate with the professional sports change? The modeling alternative to the method employed in this study is to identify the list of independent variables which explain a city’s peculiar economic performance.

Of course, in some cities there are concurrent economic developments that obscure the impact of sports on a municipal economy. My sense, however, is that this bias usually works in favor of detecting a statistically significant economic impact induced by professional sports. If it so happens that a few cities for which the professional sports landscape changes are cities that are simultaneously inducing growth in other ways, professional sports will appear to be a greater catalyst for growth than it actually is.

Indianapolis is a case in point. While Indianapolis articulated and implemented a strategy of growth through sport, it simultaneously invested heavily in government and university infrastructure. As a consequence, professional sports in Indianapolis may statis-
tically surface as far more economically important than it actually is. On the hand, suppose a city-sponsored referendum to subsidize the construction of a new stadium fails and the team relocates to another municipality as a consequence. Further, suppose the city uses the funds proposed for the stadium for some other purpose so that overall city economic activity is left unaltered. In this instance, the team would emerge as statistically inconsequential to the city.

The large sample used in this study arguably allows for the detection of a pattern of sport induced economic development, should one exist, despite the sort of complication posed by the cases noted above. If professional sports is important in inducing economic growth, it should be evident in at least some municipalities that comprise this statistical sample.

Several other features of the model should be noted. First, the specification of the dependent variable in this equation builds on previous work which substantially reduces the need to experiment with econometric design (Baade & Dye, 1990). Ideally, it would be preferable to develop an econometric construct that included the myriad of independent variables that influence city growth patterns so that the economic impact of the team or stadium could be isolated. Arguably, there are no urban growth models yet conceived that are complemented by all the necessary data that would allow an unbiased consistent estimate of a stadium’s or team’s impact on a city’s economy. Clearly, there is not a model that would isolate the stadium or team effect for the more than 30 cities that adopted a professional team in one of the four major sports or built a new stadium for a team between 1958 and 1987.

Second, in specifying the length of time a stadium or arena could be considered new, earlier research about the duration of a new stadium novelty effect was used. Specifically, Noll (1974) determined that the novelty of a new stadium in baseball lasted somewhere between seven and 11 years. For the purpose of this analysis, stadium is considered new for ten years.

Third, first differences for real, per capita personal incomes for individual cities were used to more completely capture the change in a city’s economic activity induced by a stadium or team. Had an average of city real, per capita income over the sample time period been deducted from the observed level of city economic activity in year $t$, the impact of a sports change in the initial year of that change would have been muted. Using an average would have reduced the likelihood that a sport induced change would have been found because the economic impact of a team or stadium in its first year would have been averaged over the stadium or team history. Therefore, the model represented by Eq. 1 increases the likelihood of statistically significant coefficients for the stadium and team variables.

Fourth, because the professional sport industry is small, relative to a large city’s economy, finding a city in which professional sports is statistically significant in determining per capita real income is arguably unlikely. To establish that professional sport contributes positively to metropolitan economies, however, the method employed here requires only that sport be significant in determining changes in city per capita income not explained by trends (urban growth trend for the country and a particular city’s growth trend). In the absence of a statistically significant relationship between professional sports and that portion of changes in real per capita income not explained by trend, it is reasonable to conclude that professional sport is of little consequence to the conduct of an urban econ-
Fifth, the number of teams and new stadiums are not highly correlated. In the overwhelming majority of cases, new stadiums have been or are being constructed for teams currently residing in those cities or for teams taking up residence in a city that already has an appropriate facility. To be more precise, of the 155 changes in the professional sports industry among the 35 Major League cities analyzed during the 1958 through 1987 sample period, 11 of the changes combined a new team with a new stadium.

Tests were conducted for individual cities and for all cities in the sample. The panel used for the pooled analysis consists of 48 cities (13 of which have no professional sports teams) over a 30 year period (1958-1987). For the pooled analysis, there are a total of 2880 ($48 \times 30 \times 2$) possible observed changes from one year to the next in the number of franchises hosted or stadiums built by cities. One hundred fifty-five of these cells exhibit some change in a city’s professional sports environment defined by a change in the number of teams hosted or the number of new sports stadiums built. In considering the number of changes for metropolitan areas individually, cities typically experienced three or four changes during the sample period. However, some cities endured a number of changes far greater than the average. For example, Los Angeles experienced 12 changes in its professional sports industry over the 30 year sample period.

In this paper’s sample, no change in a city’s professional sports industry occurs for one of two reasons. First, more than 25% of the sample consists of cities that have no professional sports presence in baseball, basketball, football, or hockey. Second, cities do not usually adopt teams or build stadiums at the same time.

If through the empirical application of Eq. 1, it is determined that professional sport is of little or no economic consequence to a city, an explanation must be found. After all, sport spectating involves spending and it is axiomatic that one person’s spending constitutes income for others.

Thus, the partial equilibrium estimates characteristic of many economic impact studies tacitly assume that spending in conjunction with sport spectating represents spending that would not otherwise occur. Such an assumption is not entirely realistic. Spectating at a sporting event is but one option with regard to the use of leisure time and money. If aggregate spending does not increase with a city’s acquisition of a new stadium or professional sports franchise, it may well be because sports expenditures replace spending on other leisure pursuits. If Eq.1 fails to confirm a connection between professional sports and city per capita income, it may well be because sport spending substitutes for other forms of leisure spending. If leisure spending substitutions by a municipality’s citizens are complete, professional sports will induce economic growth only if it attracts money from outside the city (exportation of sports services) or keeps money inside the city previously spent outside the city’s walls (import substitution). Eq. 2 is designed to provide evidence on the extent to which professional sport increases city spending and income through improving its balance of trade position with the outside world.

\[
CE_{i,t,SE_{j,t}} = \beta_0 + \beta_1 CRPCY_{i,t,SRPCPY_{j,t}} + \beta_2 CAWW_{i,t,SAWW_{j,t}} \\
+ \beta_3 CPOP_{i,t,SPOP_{j,t}} + \beta_4 NT_{i,t} + \beta_5 NS_{i,t} + \beta_6 TRENDE + e_t,
\]
where,

\[ CE_{i,t}/SE_{j,t} = \text{city } i\text{'s share of state employment in the amusement and recreation} \]
\[ \text{industry (SIC 79) or the commercial sports industry (SIC 794) at time } t, \]
\[ CRPCY_{i,t}/SRPCY_{j,t} = \text{ratio of city } i\text{'s real per capita personal income to state } j\text{'s at time } t, \]
\[ CPOP_{i,t}/SPOP_{j,t} = \text{city } i\text{'s share of state population at time } t, \]
\[ CAWW_{i,t}/SAWW_{j,t} = \text{ratio of average hours worked per week in the durable goods sector} \]
\[ \text{in the city relative to the state at time } t, \]
\[ NT_i = \text{number of professional sports teams in city } i \text{ at time } t, \]
\[ NS_j = \text{number of new stadiums in city } i \text{ at time } t, \]
\[ TREND = \text{a variable assigned a value of 1 for the first observation and numbered consecutively for each observation thereafter}, \]
\[ e_i = \text{stochastic error}. \]

Two observations with regard to data need to be noted. First, statistics were constructed from Bureau of Labor Statistics, *County Business Patterns*. In constructing the data set, care was taken to ensure consistency. Any scholar who has used metropolitan statistics over time is aware that the Department of Commerce frequently changes its definition of a metropolis (MSA statistics were used in this study) and its SIC classification of various goods. All changes in SIC classifications were considered to ensure a uniform data set.

Second, consistent information for average hours worked per week were available for the durable goods industry only. Thus, data for this industry were used as a proxy for leisure time for the city and state economies.

Regression analysis for a sample consisting of 48 cities (cities that comprise the sample are identified in Table 3) in the United States over the period 1958 through 1987, a sample that included every city that hosted a professional team in one of the four major team sports (baseball, football, basketball, and hockey) as well as other cities, was undertaken for Eq. 1. Ten cities for periods ranging from 1964-1989 (Cincinnati) to 1977-89 (Denver) constituted the sample for which regressions were run for Eq. 2.

**TABLE 3**

<table>
<thead>
<tr>
<th>Cities Constituting the Sample for Eq. 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Region</strong></td>
</tr>
<tr>
<td>Far West</td>
</tr>
<tr>
<td>Great Lakes</td>
</tr>
<tr>
<td>Midwest</td>
</tr>
<tr>
<td>New England</td>
</tr>
<tr>
<td>Plains</td>
</tr>
<tr>
<td>Rocky</td>
</tr>
<tr>
<td>Mountain</td>
</tr>
<tr>
<td>Southeast</td>
</tr>
<tr>
<td>Southwest</td>
</tr>
</tbody>
</table>
EMPIRICAL RESULTS AND ANALYSIS

The results of the empirical tests based on Eq. 1 were statistically insignificant for all but a few cities. The number-of-teams variable was statistically significant for Indianapolis (positive correlation) and Baltimore (negative correlation). As Rosentraub and colleagues (1994) indicated, during the sample period identified in this research, Indianapolis had implemented a development strategy of which sport was only a part. The statistically significant team variable for Indianapolis may well have occurred because the model failed to separate the various parts of Indianapolis's development program. The stadium variable positively correlated with trend-adjusted, real, per capita personal income for none of the 35 cities in the sample that hosted a professional sports team during the sample period. A negative correlation, however, for the stadium variable was found for Washington, D.C., San Francisco/Oakland, and St. Louis. For the collection of cities, the coefficients for new teams and stadiums were statistically insignificant as well.

Two observations with regard to the regression analysis need to be noted. First, although the specification of the dependent variable involved the use of first differences, the independent variables were not expressed as first differences. Consequently, the regressions were run using the Cochrane-Orcutt procedure to address a potential autocorrelation problem. Second, a test for heteroscedasticity for the pooled data was not conducted for two reasons: (a) individual cities represented the paper's primary focus and (b) the results for almost all the cities were insignificant, and the insignificant results for the panel data confirmed what individual city results suggested. For a comprehensive discussion of those results see Baade (1994, forthcoming).

Even though the results based on Eq. 1 with few exceptions indicated no statistical significance, other economic impact estimates, though substantial in terms of absolute dollars, would not be statistically significant for a large urban economy. For example, it may be that a $100 million economic impact would not surface as statistically significant for New York or Chicago. It is, however, far more likely that trend-adjusted city statistics, those used in this analysis, would correlate with changes in a city's professional sports character.

Because economic impact studies are prospective in nature, we cannot compare economic activity at the same point in time in one city with a team or new stadium to one without. To offer some perspective, we have calculated a ratio for the trend-adjusted, real per capita personal income figures for this study and inflation-adjusted estimates of economic impact for the New Orleans Superdome over the first ten years of its life, 1975–1985. The Superdome economic impact estimates were derived from the study undertaken by Eddystone C. Nebel, III, (1986). It should be noted that the figure used in the Nebel study was the event impact only. New Orleans was chosen because estimates on the Superdome's economic impact were available over an extended period of time and the Superdome is arguably the most elaborate and expensive structure in real terms of any stadium or arena in the United States.

Real per capita changes for New Orleans’ economy estimated as attributable to the Superdome are on average 1.1 times as large as the trend-adjusted, real per capita statistics used in this analysis (Nebel’s estimates of stadium impact alone account for more than 110% of all New Orleans growth not explained by trend). If the estimates were accurate representations of the Superdome’s economic impact and if our investigation of New
Orleans revealed a statistically significant impact from professional sports, then we would expect a statistically significant correlation between the dependent variable and estimate of the Superdome’s impact provided by Nebel. The coefficient for the Superdome, however, was neither positive nor significant. In light of the statistical evidence, it is reasonable to conclude that the economic impact estimates for the Superdome exaggerate its importance.

Why are the vast majority of real per capita outcomes statistically insignificant? Regression results based on Eq. 2 provide a partial answer to this question. The results of those regressions are recorded in Tables 4 (SIC 79 results) and 5 (SIC 794 results).

In reviewing the results recorded in Tables 4 and 5, several statistical procedures or outcomes of procedures should be noted: (1) The Cochrane-Orcutt method was used to deal with the serial correlation problem for cities taken individually. (2) For the pooled city data, heteroscedasticity was determined not to be a problem. (3) The cross-correlation coefficients matrix for independent variables indicated multicollinearity was not an issue and (4) although heteroskedacity was not judged to be a problem, there is no assurance that all other classical error assumptions hold. Indeed, had there been sufficient degrees of freedom.

**TABLE 4**

Estimating the Impact of Stadiums and Teams on Employment in the Amusement and Recreation Industry for Selected Cities in the United States

<table>
<thead>
<tr>
<th>City/Stat</th>
<th>β₀</th>
<th>β₁</th>
<th>β₂</th>
<th>β₃</th>
<th>β₄</th>
<th>β₅</th>
<th>β₆</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cincinnati</td>
<td>.19</td>
<td>−.17</td>
<td>.10</td>
<td>.04</td>
<td>.006</td>
<td>.008</td>
<td>.001</td>
<td>.63</td>
</tr>
<tr>
<td>Denver</td>
<td>−.51</td>
<td>.45</td>
<td>.33</td>
<td>.69</td>
<td>.001</td>
<td>−.001</td>
<td>−.01</td>
<td>.52</td>
</tr>
<tr>
<td>Detroit</td>
<td>.73¹</td>
<td>04</td>
<td>−.32</td>
<td>.39</td>
<td>.01</td>
<td>.005²</td>
<td>N.A.</td>
<td>.89</td>
</tr>
<tr>
<td>Kansas City</td>
<td>−.18</td>
<td>−.67</td>
<td>1.23</td>
<td>−.49</td>
<td>.04agnetic</td>
<td>.01</td>
<td>.001</td>
<td>.50</td>
</tr>
<tr>
<td>New Orleans</td>
<td>3.81</td>
<td>−.65</td>
<td>.80</td>
<td>−.392</td>
<td>N.A.</td>
<td>(1.25)</td>
<td>N.A.</td>
<td>.16</td>
</tr>
<tr>
<td>Pittsburgh</td>
<td>−.13</td>
<td>.25</td>
<td>.10</td>
<td>.07</td>
<td>8.70</td>
<td>N.A.</td>
<td>(1.12)</td>
<td>.06</td>
</tr>
<tr>
<td>San Diego</td>
<td>−1.10</td>
<td>.55</td>
<td>.78</td>
<td>−.51</td>
<td>.015²</td>
<td>.01</td>
<td>.01¹</td>
<td>.95</td>
</tr>
<tr>
<td>Seattle</td>
<td>13.79¹</td>
<td>−.11</td>
<td>−.126²</td>
<td>−.367</td>
<td>−.14³</td>
<td>.03</td>
<td>.07¹</td>
<td>.76</td>
</tr>
<tr>
<td>Tampa Bay</td>
<td>−.09</td>
<td>−.66</td>
<td>.29</td>
<td>3.65</td>
<td>−.01</td>
<td>.02²</td>
<td>.00</td>
<td>.65</td>
</tr>
<tr>
<td>All</td>
<td>−.27</td>
<td>.61</td>
<td>.28</td>
<td>.97²</td>
<td>−.01</td>
<td>.01</td>
<td>N.A.</td>
<td>.80</td>
</tr>
</tbody>
</table>

¹The data on amusement and recreation receipts (commercial sports receipts in 4.3 as well) were derived from: Bureau of Labor Statistics, County Business Patterns, (Washington, D.C.: U.S. Government Printing Office). It should be noted that in constructing the data set care was taken to ensure its uniformity. The same counties that identified an MSA (as opposed to MSA, PMSA, SMSA, etc.) were used throughout and, when certain goods were recategorized by SIC, all reclassifications were taken into account to ensure a uniform database. In part, the labor intensive nature of this work as well as reliable data and their availability limited the number of cities in this sample and the number of years.

²Significant at the 1% level.

¹Significant at the 5% level.
TABLE 5

Estimating the Impact of Stadiums and Teams on Employment in the Commercial Sports Industry for Selected Cities in the United States¹

<table>
<thead>
<tr>
<th>City/State</th>
<th>( \beta_0 )</th>
<th>( \beta_1 )</th>
<th>( \beta_2 )</th>
<th>( \beta_3 )</th>
<th>( \beta_4 )</th>
<th>( \beta_5 )</th>
<th>( \beta_6 )</th>
<th>( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cincinnati</td>
<td>.28</td>
<td>.02</td>
<td>-.35</td>
<td>1.53</td>
<td>-.02</td>
<td>.02²</td>
<td>.003²</td>
<td>.59</td>
</tr>
<tr>
<td></td>
<td>(.38)</td>
<td>(.07)</td>
<td>(-.63)</td>
<td>(1.94)</td>
<td>(-1.36)</td>
<td>(.271)</td>
<td>(3.71)</td>
<td></td>
</tr>
<tr>
<td>Denver</td>
<td>-9.40³</td>
<td>.93</td>
<td>-.54</td>
<td>16.77¹</td>
<td>.04</td>
<td>.07</td>
<td>-.01</td>
<td>.67</td>
</tr>
<tr>
<td></td>
<td>(-2.73)</td>
<td>(.80)</td>
<td>(-.33)</td>
<td>(2.62)</td>
<td>(1.51)</td>
<td>(1.92)</td>
<td>(-1.33)</td>
<td></td>
</tr>
<tr>
<td>Detroit</td>
<td>-.04</td>
<td>.44</td>
<td>-.04</td>
<td>.51</td>
<td>N.A.</td>
<td>.02²</td>
<td>-.006²</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-.09)</td>
<td>(1.86)</td>
<td>(-.07)</td>
<td>(1.13)</td>
<td>N.A.</td>
<td>(2.44)</td>
<td>(-3.53)</td>
<td>.50</td>
</tr>
<tr>
<td>Kansas City</td>
<td>.02</td>
<td>-.51</td>
<td>1.23¹</td>
<td>-2.2²</td>
<td>.04²</td>
<td>.008</td>
<td>.006²</td>
<td>.72</td>
</tr>
<tr>
<td>Minneapolis</td>
<td>4.43³</td>
<td>-1.29⁴</td>
<td>-1.05</td>
<td>-3.29</td>
<td>N.A.</td>
<td>.04¹</td>
<td>.002²</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.02)</td>
<td>(-1.64)</td>
<td>(3.04)</td>
<td>(-3.32)</td>
<td>(4.95)</td>
<td>(1.62)</td>
<td>(3.89)</td>
<td></td>
</tr>
<tr>
<td>New Orleans</td>
<td>1.29</td>
<td>-.51</td>
<td>.11</td>
<td>.04</td>
<td>-.04</td>
<td>-.00</td>
<td>-.01¹</td>
<td>.23</td>
</tr>
<tr>
<td></td>
<td>(.14)</td>
<td>(-.86)</td>
<td>(.28)</td>
<td>(.02)</td>
<td>(-1.83)</td>
<td>(-.001)</td>
<td>(-5.39)</td>
<td></td>
</tr>
<tr>
<td>Pittsburgh</td>
<td>-1.95</td>
<td>-.53</td>
<td>-.49</td>
<td>14.45</td>
<td>N.A.</td>
<td>-.03</td>
<td>.02</td>
<td>.74</td>
</tr>
<tr>
<td></td>
<td>(-.85)</td>
<td>(-1.19)</td>
<td>(-1.11)</td>
<td>(1.47)</td>
<td>N.A.</td>
<td>(-.73)</td>
<td>(1.47)</td>
<td></td>
</tr>
<tr>
<td>San Diego</td>
<td>-1.44³</td>
<td>.76²</td>
<td>1.19²</td>
<td>-4.26</td>
<td>.02²</td>
<td>.002</td>
<td>-.01¹</td>
<td>.15</td>
</tr>
<tr>
<td></td>
<td>(-.503)</td>
<td>(6.58)</td>
<td>(8.49)</td>
<td>(-2.56)</td>
<td>(8.50)</td>
<td>(.47)</td>
<td>(-1.10)</td>
<td>.98</td>
</tr>
<tr>
<td>Seattle</td>
<td>39.82⁴</td>
<td>-1.65</td>
<td>-33.26</td>
<td>-14.68</td>
<td>-.18</td>
<td>-27¹</td>
<td>.15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2.23)</td>
<td>(-2.00)</td>
<td>(-2.71)</td>
<td>(-2.50)</td>
<td>(-1.95)</td>
<td>(-3.34)</td>
<td>(2.66)</td>
<td>.37</td>
</tr>
<tr>
<td>Tampa Bay</td>
<td>-.08</td>
<td>-.013</td>
<td>.06</td>
<td>1.24</td>
<td>.01</td>
<td>-.02²</td>
<td>-.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-.10)</td>
<td>(-.13)</td>
<td>(.29)</td>
<td>(.76)</td>
<td>(1.28)</td>
<td>(-.30)</td>
<td>(-1.58)</td>
<td>.73</td>
</tr>
<tr>
<td>All</td>
<td>-.29</td>
<td>.50²</td>
<td>-.17</td>
<td>.90²</td>
<td>.00</td>
<td>.01</td>
<td>N.A.</td>
<td>.71</td>
</tr>
</tbody>
</table>

¹The data on amusement and recreation receipts (commercial sports receipts in 4.3 as well) were derived from: Bureau of Labor Statistics, *County Business Patterns* (Washington, D.C.: U.S. Government Printing Office). It should be noted that in constructing the data set care was taken to ensure its uniformity. The same counties that identified an MSA (as opposed to MSA, PMSA, SMSA, etc.) were used throughout and, when certain goods were recategorized by SIC, all reclassifications were taken into account to ensure a uniform database. In part, the labor intensive nature of this work as well as reliable data and their availability limited the number of cities in this sample and the number of years.

²Significant at the 99% level.

³Significant at the 95% level.

Note that the dependent variable for Eq. 2 was defined as the city’s share of the state value for employment in either the amusement and recreation or commercial sports industry. By specifying the dependent variable this way, it was expected, in part, that the same factors that account for trends in the leisure industry for cities and states (demographic changes or the business cycle, for example), separate from the independent variables specified, would be factored out. For example, a general downward trend in economic activity for the state imitated exactly by the city would leave the city-state ratio of overall economic activity unaltered. If leisure spending traced general economic activity for both the state and city, the ratio of city-state leisure spending would be unaffected by changes in general business conditions (i.e., the effect of the business cycle would be accounted for) and there would be no need to specify the variables that determine changes in business conditions.
It was expected that a city’s share of state amusement and recreation or leisure spending would vary directly with the ratio of city to state real per capita income (income effect). Similarly, it is plausible that the availability of leisure time in the city, relative to the state, would determine the city’s share of the state’s leisure industry. In reflecting on our representation of the available leisure time variable, we expected the city’s share of state employment in the amusement and recreation industry to vary inversely with the ratio of average hours worked per week in the city relative to the state. Further, it seemed likely that the more the state’s population is concentrated in a city, the greater the concentration of state amusement and recreation (commercial sports) jobs in that city.

If professional sports induce job growth, it was expected that a city’s share of state jobs in the amusement and recreation industry (commercial sports industry) would increase with an addition of a professional sports team or stadium. This expectation echoes the theory alluded to above. Professional sports must export their services to the rest of the state (region), create an import substitution industry, or in some other way increase aggregate spending to represent an economically significant addition to the city’s economy.

In the analysis that follows it is tacitly assumed that the demand for labor in any industry is derived from the spending on the industry’s products. The regression results based on Eq. 2 recorded in Table 4 for all cities conform to expectations about the relationship between a city’s share of state jobs in the amusement and recreation industry and per capita personal income, population, and leisure time (negative coefficient, but statistically insignificant). In the presence of these variables for the ten sample cities taken collectively, adding professional sports teams and stadiums has no statistically significant impact on job creation in the city’s amusement and recreation industry. Apparently, adding a professional sports team or stadium to a city’s economy does not increase aggregate spending in the city, through increased exports or import substitutions, in an amount sufficient to increase the city’s share of employment in the amusement and recreation industry.

This result suggests two things. First, adding a professional sports team or stadium to a city’s economy appears to realign leisure spending rather than adding to it and is, therefore, neutral with regard to job creation. Second, the fan base supporting professional sports appears to be insufficiently foreign to the city to contribute significantly to metropolitan economic activity. The exportation of the services of the teams or stadiums and/or the import substitution created is generally insufficient to induce job growth that is measurably different from zero.

Regression results using the city’s share of state employment in the commercial sports industry (SIC 794) as the dependent variable are generally consistent with the previous results. These regression results are reported in Table 5.

One interpretation of these results is that the substitutions in leisure spending induced through changing a city’s professional sports landscape may in large measure occur in some cases in the commercial sports sector. Noll (1974) and Baade (1990) indicate that individuals and/or families budget a certain amount of time and money for commercial sports activities and, therefore, substitute spending across teams and seasons within a city. A stadium or team would not induce any statistically significant change in economic activity if the realignment of leisure spending is such that no net jobs are created. The $\beta_4$ or $\beta_5$ coefficients could be positive or negative depending on how labor intensive the expanding professional sports industry in a particular city is relative to the contracting leisure indus-
try. Therefore, the negative coefficient for the stadium for Tampa Bay may imply that the stadium uses labor less intensively per dollar spent on its activities than the leisure activity for which it substitutes.

One alternative explanation for the negative Tampa Bay stadium coefficient is that leisure time spent at Tampa Bay’s stadium translates into fewer dollars (and fewer jobs) than the leisure activities for which the stadium substitutes.

A word of caution is advisable at this point. Given the paucity of data (for example for San Diego and Seattle there are only ten observations), any conclusions for individual cities are highly tenuous. Indeed, some of the signs for coefficients for individual cities run counter to expectations. For example, the population coefficients in Table 5 for Seattle, San Diego, and Kansas City were negative. It may be that over the sample period, the leisure industry in rapidly expanding Western cities did not develop as quickly as other industries (it took Los Angeles and Seattle longer to acquire a major league baseball team than their growth and populations would have suggested). Such an interpretation, however, does not fit any theory developed in this paper and as a consequence could be viewed as ad hoc. Suffice it to say that, given the paucity of data, it may be premature to decide sport subsidy policies based on these individual city observations.

With this caveat in mind, the largest positive statistically significant $\beta_4$ coefficients for the amusement and recreation industry were found in Kansas City. (It is interesting to note that statistically significant, positive coefficients were found only in cities west of the Mississippi.) It may be that Western cities in the United States are more geographically isolated in a sports sense and are, therefore, more likely to have a regional following. In other words these cities are more likely to export their sports services and thus add to aggregate spending in the city. If we multiply the Kansas City $\beta_4$ coefficient by the number of amusement and recreation jobs in the state for Kansas City, a professional sports franchise accounted for 601 jobs in Kansas City in 1987. No city exhibited a positive statistically significant stadium coefficient for amusement and recreation jobs, but for Tampa Bay a negative statistically significant $\beta_5$ coefficient was found.

Consistent with the results recorded in Table 4 for cities taken together (our panel contains more than 130 observations), sports teams and stadiums have an insignificant impact on jobs in the commercial sports industry. Once again all the signs for the statistically significant coefficients conform to a priori expectations and the adjusted correlation coefficients and F statistics suggest a reasonably robust model. Based on the evidence recorded in Table 5, professional sports do not seem to create jobs for their city hosts, certainly not in the numbers promised by their boosters.

**CONCLUSIONS AND POLICY IMPLICATIONS**

Public subsidies for professional sports have been rationalized on the grounds that teams and stadiums induce economic expansion and create jobs. One measure of economic development is real income. In an earlier paper, Baade (1994) found few instances of a correlation between a city’s adoption of a team or construction of a stadium and increases in city real per capita income. One purpose of this paper was to provide cities with a methodology and statistics for enhancing their perspective on a second rationale for public subsidization of professional sports, job creation.
For jobs to be created within a metropolis, professional sports would have to either induce an increase in aggregate spending on city goods and services or induce spending shifts toward industries that exhibit a more labor-intensive character. In general, the results of this study do not support a positive correlation between professional sports and job creation. This finding, coupled with the absence of a positive correlation between professional sports and city real per capita income, suggests that professional sports realign economic activity within a city’s leisure industry rather than adding to it. These results are at odds with what has been promised (often articulated through economic impact studies) by sports boosters.

These results suggest that professional sports have been oversold by professional sports boosters as a catalyst for economic development. Regional economic models, even the sophisticated models constructed by Regional Economic Models Incorporated (REMI), are potentially misleading if those estimating the impact of professional sports do not conduct their analyses through general rather than partial equilibrium systems. Mills (1993) has provided extensive critiques of the economic impact studies commissioned by advocates of subsidies for professional sports. Cities should be aware that the professional sports industry is relatively small and involves substitutions in leisure spending that can mute an impact identified in a partial equilibrium framework. As a consequence, cities should be wary of committing substantial portions of their capital budgets to building stadiums and to subsidizing professional sports in the expectation of substantial income and job growth. As a catalyst for economic development, professional sports’ batting average resembles that of a replacement player rather than a major leaguer.

ACKNOWLEDGMENT: Special thanks to the Kemper Foundation for helping fund this research, to Ms Sheila Somers, my senior research assistant, for compiling the data that were essential for this study, and to the anonymous reviewers who provided substantial and constructive criticisms.

REFERENCES


