

Should Cities Be Ready for Some Football?

Assessing the Social Benefits of Hosting an NFL Team

BY GERALD A. CARLINO AND N. EDWARD COULSON

Are the large public expenditures on new stadiums a good investment for cities? Does hosting a major sports team have benefits? Although public subsidies for professional sports teams are controversial, the answer to these questions may well be yes. In this article, Jerry Carlino and Ed Coulson report the results of their 2003 study: When quality-of-life benefits are included in the calculation, building new stadiums and hosting an NFL franchise may indeed be a good deal for cities and their residents.

Rapid population growth in many metropolitan areas in the United States has made them economically viable locations for professional sports franchises such as those of Major League Baseball (MLB) or the National Football League (NFL). But since all four of the major sports leagues tightly control both the creation of new franchises and the relocation of teams, cities' demand for teams far exceeds the supply.¹

¹ The other major sports leagues are the National Hockey League (NHL) and the National Basketball Association (NBA).



Jerry Carlino is a senior economic advisor and economist in the Research Department of the Philadelphia Fed.

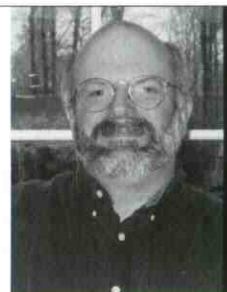
As a result, the price cities have to pay to get teams has gone up. Cities have offered favorable stadium deals in their efforts to retain or attract teams. Partly as a result of this fierce competition for teams, "America is in the midst of a sports stadium construction boom," as noted by Roger Noll and Andrew Zimbalist. Professional sports teams are demanding — and receiving — subsidies from local governments for the construction or restoration of sports stadiums. According to Raymond Keating, the total cost of 29 sports facilities that opened between 1999 and 2003 is expected to be around \$9 billion. Keating found that taxpayers' money financed around \$5.7 billion, or 64 percent, of this \$9 billion.

The boom in stadium construction coupled with the increased public support for these facilities raises the question: "Are subsidies to sports teams a good investment for cities?" The answer has been controversial.

Often, subsidies are justified by claims that attracting or retaining sports teams more than pays for itself in increased local tax revenue by creating new jobs and more spending. More recently, local officials have come to view a downtown stadium project as an important part of the revitalization of the central city's urban core. Advocates of this approach point to Jacobs Field in Cleveland, Coors Field in Denver, and Camden Yards in Baltimore as models of how stadium-based development can work. However, independent studies by economists often indicate that taxpayers may not be getting such a good deal. Most studies that have attempted to quantify the creation of jobs, income, and tax revenue have found that the direct monetary impact felt by a city hosting a sports team is less than the sizable outlay of public funds. Yet civic leaders continue to make the case for professional sports and the beneficial role they play in the community.

Recently, economists have pointed out that previous studies missed a basic point: Professional sports teams add to residents' quality of life in cities that host teams. It's possible that people obtain benefits from having a local sports team even if they never go to a game. They root

Visiting Scholar **Ed Coulson** is a professor of economics at the Pennsylvania State University, University Park, Pennsylvania.



for the local athletes, look forward to reading about their success or failure in the newspaper, and share in the city-wide joy when the home team wins a championship.

Economists have long studied the effects of an area's quality of life on wages and the cost of housing. Past studies have found that people are willing to pay indirectly for local amenities, such as good weather, scenic views, and nearness to the ocean, in the form of higher rents and lower wages. Similarly, if people benefit from having a professional sports franchise in their community, they are presumably willing to pay for it — if not directly through the purchase of tickets, then indirectly through an increased willingness both to pay more for housing in the area and to accept lower wages.

We did a study in 2003 in which we looked at the quality-of-life benefits residents receive in cities that host an NFL team. We found that once quality-of-life benefits are included in the calculus, the seemingly large public expenditure on new stadiums appears to be a good investment for cities and their residents.

THE POLITICAL ECONOMY OF SPORTS FRANCHISES

Professional sports teams play in facilities heavily subsidized by local governments. Typically, cities use general revenue bonds to finance their share of the cost of a stadium. These bonds are paid off through a variety of sources, for example, ticket surcharges, taxes on hotel rooms and car rentals, and state lottery proceeds. These stadiums are usually publicly owned and leased to teams. A city derives revenue from publicly built stadiums in a number of ways. Chief among them are rental payments made by teams; the local government's share of parking, concessions, and luxury boxes; prop-

erty taxes on the stadium paid by the team; and rent received for nonsports activities, such as concerts.

On the cost side, the city must account for depreciation and maintenance of the stadium, and the city's share of the cost of providing utilities, refuse collection, and police, fire, and rescue services. In addition, municipalities must account for what economists call opportunity costs: local governments' spending on stadiums lowers spending for other worthy

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projects or programs. For example, suppose the annual cost of a stadium in City A is \$20 million a year for the next 30 years. If an entry-level teacher's salary (including benefits) runs about \$60,000 annually, one measure of the opportunity cost of the stadium is the 333 teachers that could have been added to the city's school system. Indeed, to keep the Cincinnati Bengals from making good on a threat to move to Baltimore in 1995, local officials agreed to a \$540 million deal for two new stadiums (one for the Reds, too). Although the action might not have been linked to the stadium-funding bill, *The Economist* noted that shortly before the vote on the stadium-funding bill, Cincinnati laid off 400 staff members from its school district, including 200 teachers.²

In principle, cities could set rental payments to cover all the costs associated with constructing and operating municipal stadiums. In practice,

since all four major sports leagues exercise considerable control over the geographic mobility of established teams as well as over the creation of new franchises, cities do not set rental payments in this way. In the intense competition for teams, cities have offered favorable stadium deals in their efforts to retain or attract sports franchises.

Numerous independent studies by economists have shown that any revenue cities receive typically fails to cover costs because of favorable clauses in the lease regarding rent; the teams' share of parking, concessions, and luxury boxes; and partial or full forgiveness of property taxes. For example, according to Michael Leeds and Peter von Allmen, the NFL's Baltimore Ravens pay no rent, while MLB's Chicago White Sox pay \$1 a year for the use of New Comiskey Park. In examining 25 sports facilities built between 1978 and 1992, James Quirk and Rodney Fort calculated that the annual subsidy to professional sports teams averaged \$9.2 million (or \$12.3 million in 2002 dollars). Even then, the annual subsidy is underestimated because data were not available for investments made to facilities subsequent to original construction. Quirk and Fort also estimated that the annual subsidy jumps to \$20 million (\$29 million in 2002 dollars) for the average stadium when investments subsequent to original construction are included in the calculus.³

THE ECONOMIC DEVELOPMENT RATIONALE AND EVIDENCE

The question becomes: Why do local governments provide

² "Footloose Football," *The Economist*, September 9, 1995, p. 90.

³ John Siegfried and Andrew Zimbalist point out that the escalating costs of recent stadium construction suggest that the average subsidy has surely grown since 1992.

such large subsidies to professional sports teams? One justification for the subsidy has been that sports teams increase employment and income and promote growth of the local economy. Obviously, public investment in stadiums can be beneficial, but how do we evaluate a new sports facility's contribution to local economic growth?

To address this question, most proposals to use public funds for building stadiums are accompanied by an economic impact analysis. These studies attempt to evaluate the costs and benefits of a new stadium.

The costs and benefits fall into four broad categories: direct benefits, indirect benefits, construction costs, and operating expenses. Direct benefits stem from new spending that a team generates for the city. This includes spending by fans in local restaurants and hotels and for souvenirs and spending by players and other team employees and the team's spending for local goods and services.

These direct expenditures by teams, their employees, and their fans become income for other city residents, who then re-spend part of this income when purchasing other local goods and services. This re-spending process, which continues through second, third, and subsequent rounds, is the indirect benefit. Since direct expenditures lead to indirect expenditures, the direct expenditures are said to have a "multiplier" effect on the local economy. Thus, for example, if a dollar of direct spending resulted in an additional dollar of indirect spending in the local economy, total spending in the local area would be \$2 and the multiplier's value is 2.⁴ According to Joseph Bast, impact studies have used multipliers with values as high as 3.

⁴ Jordan Rappaport and Chad Wilkerson provide summary details for a representative sample of recent stadium impact studies.

One potential shortcoming of impact studies is that they are often commissioned by proponents of the stadium projects, such as teams themselves, and conducted by accounting

sports teams, economists have used other sorts of calculations to study this impact. These studies have attempted to measure the local impact of hosting a team using three different methods.

Because of the difficulties in using "multiplier analysis" to assess the economic impact of professional sports teams, economists have used other sorts of calculations to study this impact.

firms or local chambers of commerce. According to Noll and Zimbalist, the authors of impact studies tend to make very favorable assumptions about the income and number of jobs generated and how much of this income stays in the local economy. In addition, they may make unrealistic assumptions regarding construction and operating costs and fail to account for the opportunity cost of the funds tied up in these projects; therefore, the net benefits of stadium projects can be vastly overstated depending on the assumptions made.

For example, in its analysis of the new stadium being built for the NFL's Baltimore Ravens, the Maryland Department of Business and Economic Development estimated an annual economic benefit to the Baltimore metropolitan area of \$111 million and the creation of almost 1400 new jobs. According to Leeds and von Allmen, independent analysis found a much smaller impact on annual income (\$33 million) and jobs (534). In general, independent studies by economists suggest that the value of local multipliers is at most 1.25, less than one-half of the value suggested in some impact studies.

Because of the difficulties in using "multiplier analysis" to assess the economic impact of professional

First, some studies have compared the growth rates of income or employment in cities and metropolitan areas that have teams with growth rates of these variables in cities that do not have teams. For example, in a 1994 study, Robert Baade found no significant difference in per capita personal income growth during the period 1958 to 1987 between metropolitan areas with major league sports teams and those without.

Another way to measure teams' impact on the local economy is to compare growth before and after the acquisition of a new major league team. In a 1997 study, Baade and Sanderson looked at the impact on employment and output in 10 metropolitan statistical areas (MSAs) that had acquired new teams between 1958 and 1993. They found that while certain sectors closely related to professional sports do show some employment gain, aggregate employment shows little impact from the existence of sports teams.

A final way is to measure the impact of a specific team (such as the Baltimore Orioles) on economic development in a specific location (Maryland). For example, in a 1997 study Bruce Hamilton and Peter Kahn found that even at Camden Yards — widely believed to have been a good investment for Baltimore — public expen-

diture cannot be justified on grounds of local economic development. They estimate that Maryland and its municipalities lose about \$9 million annually on Camden Yards.⁵ They report that the stadium generates enough revenue to cover capital and maintenance costs, but under the conditions of the lease, the team's owners keep most of this revenue.

Regardless of the method used by independent researchers, the bottom line is that subsidies to sports teams appear to be much greater than the economic benefits they generate for cities. Findings such as these led Siegfried and Zimbalist to conclude that "few fields of empirical research offer virtual unanimity of findings. Yet, independent work on the economic impact of stadiums and arenas has uniformly found that there is no statistically significant positive correlation between sports facility construction and economic development."

Moreover, economists have pointed out that local spending related to professional sporting events may result in less spending on other recreational activities. While the attraction of a new team to a city or the construction of a new stadium may lead to entirely new spending in the local economy, it's more likely that much of the local spending by fans is redirected from activities occurring elsewhere in the local economy. Since households have limited budgets for and time to spend on leisure activities, sporting events may merely shift the timing

and location of spending within the metropolitan area but leave aggregate spending unchanged.⁶

One exception would be if sports events attracted a large number of "out-of-town" fans, thus bringing new spending into the region. According to Noll and Zimbalist, these types of fans account for only 5 percent to

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20 percent of all fans attending major league sporting events. Siegfried and Zimbalist point out that there is considerable evidence that out-of-state fans do not come to town because of regular season sporting events. They are in town for other reasons, such as a business trip or a visit to family and friends. Thus, if they had not attended a regular season game, they would have spent money on other types of leisure activities the region has to offer.

These findings pose the question: Is there an economic justification for subsidizing professional sports teams in an era in which local governments' budgets are under intense pressure and given the sizable opportunity cost associated with these types of projects?

⁶ The shift in spending may be meaningful to an area's central city if sports fans who spend money because they are attending games would have patronized suburban establishments in the absence of a game.

EXTERNAL BENEFITS TO THE RESCUE

The subsidies granted to professional sports teams, in some sense, suggest that civic leaders and residents view professional sports teams as valued assets of a city. Frequently, civic leaders speak of the intangible benefits of hosting major league sports, such as civic pride. A typical statement expressing these sentiments comes from Philadelphia's mayor, John Street: "We are incredibly fortunate to be the home of great professional sports franchises. They enrich our community, fortify our tax base, and provide major support for the region's future economic growth. And then there are the intangible benefits: These Phillies [Philadelphia's major league baseball team], if we give them our full support, will bring us together [and] solidify a sense of community with civic pride as they drive toward the pennant."

Similarly, economists have noted that professional sports teams contribute to the *quality of life* in an area by increasing the satisfaction or happiness of residents in general, not just those who attend games. As we noted earlier, it's likely that many city residents get pleasure from the presence of local professional sports teams even when they neither attend games nor pay for sports programming on cable TV. Mayor Street's words speak to the "civic pride" that can result from a successful franchise. Therefore, perhaps residents should think of a professional sports team in the way they think of a new art museum or new symphony hall or, indeed, an environmental resource such as an old-growth forest: It's a commodity from which they receive enjoyment just by having it around.

The interest that professional sports franchises generate suggests they are far more important than these other public goods. In the controver-

⁵ According to Hamilton and Kahn, the cost to the Maryland Stadium Authority for operating the stadium is approximately \$20 million annually (\$14 million in real interest and depreciation and \$6 million in maintenance). The Maryland Stadium Authority receives approximately \$6 million in rent annually from the Orioles and another \$5 million in admission tax revenue; therefore, it incurs a deficit of approximately \$9 million per year.

sial words of Art Modell, owner of the Cleveland Browns-Baltimore Ravens franchise:⁷ "The pride and the presence of a professional football team is far more important than 30 libraries" [quoted in Leeds and von Allmen's book].

So teams create value for local residents that owners of sports franchises cannot capture. That is, the team can't charge a fan for just being a fan. But that doesn't make this "external benefit" any less real. If the value of these external benefits is large enough, they alone might justify the subsidies that local taxpayers grant to teams. But because no one is excluded from enjoying the external benefit generated by local sports team, it becomes difficult to know how much this matters to people, precisely because you can't charge them for the privilege of being a fan. While these benefits are hard to measure in dollar terms, economists have made significant strides in quantifying the value residents place on similar types of quality-of-life benefits, such as clean air, scenic views, nearness to the ocean, or good weather.

Measuring the External Benefit. The value of a city's special traits, such as good weather or the existence of professional sports teams, is determined by what people are willing to pay in order to live there. This amounts to the sum of what people are willing to pay for each local character-

istic that either adds to or reduces the quality of life in an area. The trick is to determine the prices of these local amenities, or traits, since they are not bought and sold in markets.

Even though there is no explicit price for local amenities such as the presence of an NFL team, there is an *implicit* price. Suppose you are considering moving to either City A, which has an NFL team, or City B, which does not. Other than their NFL status, these cities are alike in all other aspects. Because the presence of an NFL team is something you value, you

Teams create value for local residents that owners of sports franchises cannot capture.

are willing to pay some extra amount, say, \$1000, for having a team in your city.

There are two ways in which you could pay your extra \$1000. One is by bidding up land prices, and ultimately rents, in City A relative to City B. But it is not necessarily the case that you will ultimately pay \$1000 more to rent a house in City A. Part of the cost of living in a city with an NFL team could be paid in the form of lower wages than you would have accepted in City B. What must be true is that rent and wage differentials sum to \$1000. Thus, the extent to which land rent is higher and wages are lower is the extent to which the amenity value of an NFL team is capitalized into local land markets and local labor markets. Put differently, since NFL status is the only difference between the two cities, a household's willingness to pay the extra \$1000 to live in City A must be due to the difference in NFL status.

Measuring the Amenity

Value of the NFL. Economists have developed statistical techniques to measure the variation in rents and wages that are attributable to each of the local area's traits, and economists have used these estimated implicit prices of amenities to rank areas according to their attractiveness. In our 2003 study, we argued that if people like having professional sports teams in their community, they are presumably willing to pay for it — if not directly through the purchase of season tickets, then indirectly through an increased willingness to pay for housing in the area and an increased willingness to accept marginally lower wages.

Bruce Hamilton and Peter Kahn first broached the idea that differentials in local wages and rents may provide a basis for valuing the social benefit of sports teams. They argued that while such differentials may exist, correlations between the presence of sports teams and wages and rents will surely be confounded by the correlation between these variables and city size (and perhaps other city-specific characteristics).⁸ For example, because rents tend to increase with city size and large cities tend to host NFL teams, isolating the effects of an NFL team's presence on rents may be difficult.

In our study we confronted this issue in a number of ways. We focused our attention on NFL football franchises in the 1990s, since there was movement and expansion of NFL teams in both moderate-size cities (Jacksonville, Nashville, and Charlotte) and exit of franchises in larger metropolitan areas such as Los Angeles and Houston, the nation's second and fifth largest metropolitan areas,

⁷ In validating the bonds to construct Raymond James Stadium in Tampa, home to the NFL Buccaneers, the Florida Supreme Court described the public benefits of stadium construction in *Poe v. Hillsborough County*. The court explained: "[T]he Court finds that the Buccaneers instill civic pride and camaraderie into the community and that the Buccaneer games and other stadium events also serve a commendable public purpose by enhancing the community image on a nationwide basis and providing recreation, entertainment and cultural activities to its citizens."

⁸ See also the article by Rappaport and Wilkerson.

respectively. We assume that the movement and expansions will weaken the correlation between city size and NFL teams sufficiently to facilitate estimation of an NFL effect. Still, only eight of the 32 cities had a change in their NFL status between 1993 and 1999, the period of our study, making it hard to identify an NFL effect in local wages and rents.

In addition to looking at the recent movement to moderate-size cities, we focused our attention on NFL football franchises, for two more obvious reasons. The first is the pre-eminent attention the NFL receives among all sports in the United States. If any professional sport generates a measurable differential in wages and rents across cities, football is likely to be the one. Moreover, the most serious rival for that attention, Major League Baseball, has had very little expansion in recent years and no franchise movements since the early 1970s. The NFL, on the other hand, has had a bit more expansion and substantially more franchise movement.

Perhaps more important, the location of NFL franchises probably has less to do with city-specific characteristics, such as population size and growth, than in any other major sports league. Most of an NFL franchise's revenue comes from an egalitarian split of the national TV contracts, and even locally generated stadium ticket revenue is split more equitably (60 percent to the home team, 40 percent to the visiting team) than in other sports leagues. In contrast, baseball team revenue is far more heavily weighted toward local sources, particularly local TV contracts.

In our study, we estimated the change in rents and wages resulting from a change in NFL status between 1993 and 1999. We estimated two equations: one for wages and another for rents. We found that the presence

of an NFL team raises annual rents, on average, 8 percent. We also found that wages were about 2 percent lower in cities that host an NFL team, but the differential was not statistically significant. Perhaps the demand for labor adjusts more rapidly than the supply of housing, and this more rapid adjustment tends to ameliorate the effect on wages. In addition, if the NFL amenity makes workers more productive, the demand for labor could also increase, and the effect on wages would be ambiguous. In what follows, we will focus only on the rental premium.⁹

Cost-Benefit Analysis.

Since the 53 cities in our sample had, in 1999, an average monthly rent of \$500, the finding of an average rental premium of 8 percent implies an NFL amenity premium of about \$40 a month per housing unit, or \$480 annually, on average, in cities hosting NFL

teams. In 1999, there were approximately 290,000 households in a typical central city, so \$480 per household implies that the aggregate amenity value to a city that hosts an NFL team is, on average, about \$139 million per year (or about \$184 per person).¹⁰

How do the estimates of the amenity value of hosting an NFL team compare with the subsidies? Earlier we pointed out that James Quirk and Rodney Fort calculated that the annual subsidy to professional sports teams, including investment subsequent to the original cost, averaged \$20 million in 1989 dollars (or \$27 million in 1999 dollars).¹¹ The annual quality-of-life benefit of \$139 million found in our study is substantially larger than the annual subsidy, suggesting that these subsidies were good investments for the typical city. Our study showed that the quality-of-life benefit to households easily exceeds the subsidies granted in all cities that hosted an NFL team during the 1990s.

Cost-Revenue Analysis.

While the finding that the aggregate value of the quality-of-life benefit may justify the subsidies is good news for city residents, public officials may be more concerned with the impact these subsidies have on local budgets. Our results suggest that team subsidies can also potentially pass the cost-revenue test. This means that if cities could effectively appropriate through taxation the rise in property values that resulted

⁹ Our study uses regression analysis in which we relate the level of rents and the level of wages in a city in each of two years to whether the city had an NFL franchise in 1993 or 1999. We control for city-specific traits that did not change between 1993 and 1999, such as nearness to an ocean, and we controlled for a variety of city characteristics that did vary between the two years, such as city size, city population growth, the rate of crime, local fiscal variables, and so forth. In addition, we also controlled for a large number of individual housing characteristics, such as number of rooms and age of the unit, and a random effect that controls for individual characteristics that do not vary over time. The implicit price of a professional sports franchise is measured by the coefficient of a dummy variable indicating the presence of an NFL franchise in the particular city and year. Given the existence of city-specific traits, the identification of this NFL effect comes from league expansion and franchise movements into and out of cities over the years between the two panel observations. As indicated in this article, eight of these cities had a change in NFL team status between 1993 and 1999. Six cities (Baltimore, Charlotte, Jacksonville, Nashville, Oakland, and St. Louis) did not have an NFL franchise in 1993 but had gained one by 1999. Two cities (Houston and Los Angeles) hosted an NFL team in 1993, but not in 1999. Twenty-four cities hosted an NFL team in both 1993 and 1999.

¹⁰ The average central city in our sample had a population of 753,705 in 1999. According to the *Statistical Abstracts of the U.S.*, there were 2.6 people per household in 1999, suggesting there are almost 290,000 households in a typical central city.

¹¹ Interestingly, in their 2000 study that examined the 1995 budgets for eight cities, Donald Alexander, William Kern, and Jon Neill found an annual stadium subsidy in the range of \$22 million to \$29 million, depending on the city under consideration.

from the local team's existence, any such subsidy has the potential to be self-financing. This is because higher rents imply higher housing prices for cities that host NFL franchises. The higher property values will lead to increased tax revenues for central cities when properties are reassessed.

Consider our representative city once again. In 1999, the median price of a house across the cities in our sample was \$123,433. If 8 percent of this value reflects an NFL premium in these cities and if we use the average property tax rate of 1.75 percent, available for 50 of the 53 cities in our sample, that means the NFL premium yields property tax revenue of just under \$173 per year per household.¹² This could potentially be worth about \$50 million a year in tax revenue for our representative city with 290,000 households if it hosted an NFL team. The potential increase in property tax revenue of \$50 million associated with hosting an NFL team is almost twice as large as the \$27 million annual subsidy reported by Quirk and Fort, suggesting that, on average, these subsidies are good investments for cities. Those who benefit from the team in terms of higher property values would be paying for its subsidization. If the city could not effectively design a property tax in this way, the stadium subsidies would come out of general funds. In that case, subsidies may crowd out other expenditures that may have even greater benefits. Thus, our results do not constitute a blanket endorsement for stadium subsidies.¹³ We found that the potential increase

in property tax revenue exceeds the known subsidies granted to NFL teams in 22 of the 25 cities that provided stadium subsidies (see *Costs and Benefits to Individual Cities*).¹⁴

Other Studies. While these estimates of the benefits may appear large, they are broadly consistent with estimates found in other studies that have quantified the benefits for various types of amenities. For example, Joseph Gyourko and Joseph Tracy found that the annual value for just one extra sunny day is \$7 per year per household, and Glenn Blomquist, Mark Berger, and John Hoehn found an annual value of \$12.¹⁵ Based on these studies, Jordan Rappaport and Chad Wilkerson estimated that a metropolitan area with 2 million people should be willing to pay between \$14 million and \$24 million a year for just one additional sunny day. While direct comparisons are always difficult, Rappaport and Wilkerson's numbers, along with ours, suggest that the addition of an NFL franchise makes up for a week or so of cloudy days.

In their study, Rappaport and Wilkerson also noted that cities' aggressive bids to replace teams further supports the view that the external benefits associated with hosting an

NFL team may exceed the cost of doing so. They point out that of the six cities that have lost NFL teams since 1980, "all but Los Angeles subsequently allocated considerably more public financing to attract a new NFL team than it would have cost to keep their old team." For example, voters in St. Louis approved \$280 million in public funds to build a new football stadium after the Cardinals departed for Arizona in 1987. St. Louis voters declined to allocate \$120 million toward a new stadium when the Cardinals were playing in St. Louis.

In February 2000, Bruce Johnson, Peter Groothuis, and John Whitehead conducted a survey of residents of the Pittsburgh metropolitan area, asking them how much they would be willing to pay in higher taxes to keep the NHL Pittsburgh Penguins from leaving the city.¹⁶ The average response was \$5.57 per household per year. Since there are almost 960,000 households in the Pittsburgh metro area, Johnson and his co-authors report that this gives an aggregate quality-of-life value of almost \$5.2 million per year — a present value of \$66 million if we use an 8 percent interest rate and assume a stadium life of 30 years.

According to Rappaport and Wilkerson, between 1994 and 2000, the average public contribution to NBA/NHL sports arenas was \$84 million. The quality-of-life-benefit of \$66 million represents only about 80 percent of the average subsidy. While the \$5.2 million annual quality-of-life benefit associated with hosting the

¹² We were limited to 50 of the 53 cities in calculating the potential increase in property tax revenue, since the property tax rate was not available for three cities. The median house price of \$123,433 is based on the 50 cities for which property tax rates are available.

¹³ The cost-revenue analysis we have presented here is for an average, or representative, city. Of course, the costs and revenue associated with hosting an NFL team will differ widely across cities.

¹⁴ The 8 percent increase in rents is an average effect across the 53 cities comprising our study. In addition, we assume that the effect on rents is the same for cities that gain a team as for those that lose one. In the long run, the supply of housing may increase and rents and housing prices may go up by less than the initial increases. Still, the greater number of housing units will lead to increased property tax revenue without the need to reassess housing values for tax purposes.

¹⁵ The annual values are expressed in 1999 dollars.

¹⁶ At the time of the survey there was some concern that the Penguins could not survive in Pittsburgh. The Penguins declared bankruptcy in October 1998. In addition, they continue to play in the oldest arena in professional hockey, and Pittsburgh is a relatively small market.

Costs and Benefits to Individual Cities

The cost-benefit analysis reported in the text is for a representative, or average, city used in our 2003 study. Obviously, the analysis will differ dramatically across cities. Three things will affect the potential increase in property tax revenue for a given city: the increase in property values (actually in assessed property values), the number of housing units, and the property tax rate. Obviously, property tax revenue will increase with all three variables.

The table gives the present value of the potential increase in property tax revenue, assuming that the median price of housing reflects either an 8 percent premium in cities that currently host an NFL team or a similar increase in housing values in cities that do not currently host a team. Recall that the 8 percent housing price premium is an average across cities, and this premium may be somewhat larger or somewhat smaller in any particular city. In addition, reassessment practices are not uniform across cities, and these conventions will also influence the potential increase in property tax revenue that comes from hosting an NFL team. The values shown in the second column of the table assume that the median house value in each city has been reassessed to reflect the 8 percent NFL premium.*

The table shows the cities ranked in terms of the present value of the potential increase in property tax revenue, based on a 6 percent interest rate and a stadium life of 30 years. The present value of the potential increase in property tax revenue is largest in New York City: more than \$12 billion. Second largest is Los Angeles, at \$3.6 billion, underscoring the need to have an NFL team in the area. Among cities that host an NFL team, the present value of the potential increase in property tax revenue is smallest in St. Louis: \$140.6 million.

The final column of the table shows all sources of public subsidies (state and local) provided to NFL

teams for the construction of new stadiums in 1999 dollars, obtained from the National Conference of State Legislators, in an April 1998 report called "Playing the Stadium Game." The subsidy exceeds the present value of the potential increase in property tax revenue in only three of the 25 cities that provided subsidies (New Orleans, Pittsburgh, and St. Louis). In Cincinnati and Kansas City, the present value of the potential increase in property tax revenue is only somewhat larger than the subsidy.

The escalating costs of recent stadium construction suggest that the average subsidy has surely grown over time, potentially putting more cities on the unfavorable side of the cost-revenue analysis. In the 1970s, cities contained stadium costs by building stadiums that were used for both baseball and football. Today, stadiums are dedicated to single use and include more costly features, such as luxury boxes and skyboxes. For example, Three Rivers Stadium in Pittsburgh, which opened in September 1970, cost \$159 million in current dollars and was home to both the NFL Steelers and the NL Pirates. Heinz Field, which opened in August 2001, cost \$281 million and is home to the Steelers only. The Pirates play in PNC Park, which opened in the spring of 2001 and cost \$216 million. Together these two parks cost almost \$500 million to construct, with state and local governments footing two-thirds of the cost.

In 1999, recognizing the increasing cost of stadiums, the state of Pennsylvania created the Redevelopment Assistance Fund to finance the four stadiums in Philadelphia and Pittsburgh, as well as the Giant Center in Hershey and other sports and arts facilities. The state capped its contribution at no more than one-third of the costs. Despite the escalation in the cost of stadiums, our findings suggest that team subsidies can potentially pass the cost-revenue test for the vast majority of cities that provide these subsidies.

* For any given city, we assumed that an 8 percent increase in rents resulting from the NFL premium also leads to an 8 percent increase in housing prices.

TABLE

Potential Cost and Benefit to Individual Cities for Hosting an NFL Team **(millions of 1999 dollars)**

City	Value of the Potential Increase in Property Taxes ^a	Subsidies ^b	City	Value of the Potential Increase in Property Taxes ^a	Subsidies ^b
New York	12254.5	219.5 ^c	Denver	305.6	6.9
Los Angeles	3629.3		Cleveland	296.4	
Chicago	3037.1	21.9	Memphis	289.3	
San Francisco	2414.9	138.3	New Orleans	280.3	414.3
Houston	1619.5	166.7	Minneapolis	263.0	117.7
San Jose	1326.2		Las Vegas	259.1	
San Diego	1205.3	134.5	Cincinnati	227.0	198.7
Seattle	1107.6	330.8	Sacramento	214.7	
Dallas	990.0	143.9	Raleigh	200.4	
Philadelphia	867.0	205.5	Fort Lauderdale	189.5	
Detroit	804.8	172.4	Newark	179.6	
Austin	720.9		Oklahoma City	172.0	
Phoenix	670.7	5.7	Salt Lake City	167.8	
Boston	607.1	0.0	Rochester	161.6	
Milwaukee	546.9		Kansas City	150.7	85.6
Washington	501.5	105.7	Pittsburgh	148.3	149.8
Jacksonville	475.7	132.8	Tampa	145.8	30.0
Columbus	474.1		St. Louis	140.6	313.7
Baltimore	447.9	204.4	Orlando	129.6	
Nashville-Davidson	446.7	319.2	San Antonio	120.6	
Atlanta	430.0	254.1	Greensboro	115.4	
Oakland	422.9	131.2 ^d	Hartford	108.7	
Miami	417.9	0.0	Providence	106.0	
Indianapolis	416.3	76.1	Grand Rapids	103.9	
Fort Worth	395.2		West Palm Beach	55.6	

^a Based on an estimated increase in property tax revenue resulting from an 8 percent increase in median housing price. The annual stream of property tax revenue is converted into present value terms using a 6 percent rate of discount and assuming a stadium life of 30 years.

^b Source: National Conference of State Legislators: www.ncsl.org/programs/fiscal/lfp106tb.htm. The source provided information only about subsidies for cities that had an NFL team in 1995. (Los Angeles and Cleveland did not have teams that year.)

^c It's not clear whether the money came from New Jersey or New York.

^d The cost of the original stadium was \$131.2 million. Currently, \$127.0 million of renovations are under way.

Penguins seems small, the external benefit is likely to be much larger for other professional sports, such as football. In the United States, hockey continues to have the smallest fan base

of the four major league sports. According to Rappaport and Wilkerson, in 2001, nine of the 24 NHL teams (38 percent) did not have local network television contracts. They also point

out that ratings for televised NHL games are only half those of NBA games.

The evidence provided in our study combined with the high valu-

ation placed on other quality-of-life characteristics found in other studies and the increased willingness to expand public funding for new NFL stadiums, even after a city has lost a team, substantially demonstrates that the quality-of-life benefits associated with hosting an NFL team may justify the seemingly large public expenditures.

Still, assessing the benefits and costs associated with sports teams is a complex problem. Despite our careful attempt to control for the many local factors that could affect rents, it's possible that our estimate of the implicit value of an NFL amenity is overstated because we failed to control for some factor that is positively correlated with both the presence of an NFL team and rents. If our estimate of the implicit price of an NFL amenity is overstated, our estimate of the benefits used in the cost-benefit analysis is overstated.¹⁷ On the cost side, while the dollar amount to build a stadium is

known, the opportunity cost of funds may be harder to estimate.

CONCLUSION

Public officials and civic boosters are often criticized for encouraging the provision of subsidies to sports franchises. But if the subsidization we discuss in this article is

¹⁷ To see if our findings hold up under scrutiny, we performed a variety of tests. For example, we controlled for the presence or absence of museums, another recreational amenity, and found that this variable was not statistically significant, regardless of whether the NFL variable was included in or excluded from the regression. We also found an 8 percent rental premium associated with NFL status, regardless of whether city population size was included in or excluded from the regressions. In addition, baseball added two teams during our sample period (one in Phoenix and one in Tampa Bay) that started playing in 1998. After controlling for the addition of these new teams, we found the quality-of-life premium associated with hosting an NFL team fell slightly below the 8 percent effect on rents reported in this article. The decline, however, does not appreciably affect the findings and conclusions reported here.

so politically unpopular, it is doubtful that officials would be so much in favor of it. But as we have argued, the debate over public subsidies to stadiums has focused on job and income creation in the cities in which the facilities are built. Although on that score stadium subsidies appear to be a bad idea, the range of potential effects goes beyond those involving income and job creation. While large public expenditures on the construction of new sports stadiums are, and will continue to be, controversial, our findings suggest that sports are popular, and once the quality-of-life benefits are included in the calculus, public spending on new stadiums may be a good investment for central cities and their residents. This, of course, is not the same thing as recommending that cities immediately decide to fund stadiums if only because the opportunity cost of appropriating such funds is the elimination of other, possibly more worthy programs, such as building new schools. 

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