Full Count

The Real Cost of Public Funding
for Major League Sports Facilities

JUDITH GRANT LONG
Rutgers University

Governments pay far more to participate in the development of major league sports facilities than is commonly understood due to the routine omission of public subsidies for land and infrastructure, and the ongoing costs of operations, capital improvements, municipal services, and foregone property taxes. Adjusting for these omissions increases the average public subsidy by $50 million per facility to a total of $177 million, representing a 40% increase over the industry-reported average of $126 million, based on all 99 facilities in use for the "big four" major leagues during 2001. For all 99 facilities, these uncounted public costs total $5 billion.

Keywords: public subsidies; sports facilities; ballparks; stadiums; arenas

That governments spend a lot of money on major league sports facilities is hardly breaking news: Analyses of public funding for sports facilities are ubiquitous in academic and public policy circles, with most offering the same conclusion of spiraling costs (Baade, 1987, 1996a, 1996b; Baade & Dye, 1988, 1990; Danielson, 1997; Fort & Quirk, 1995; Greenberg, 2000; Keating, 1999; Noll & Zimbalist, 1997; Petersen, 1996; Quirk & Fort, 1997; Rosentraub, 1997; Siegfried & Zimbalist, 2000; Zimmerman, 1996). These studies, however, focus on measuring the public benefits of sports facilities, particularly the creation of new jobs and tax revenues. Although acknowledging the omission of public subsidies for land,

infrastructure, lease-based expenses, and property tax exemptions, they generally treat the measurement of public cost as a secondary concern. In part, this is because most cost-benefit studies find that sports facilities produce negligible benefits when compared to construction costs alone, so adding the omitted subsidies would only serve to reinforce a case already made. As a result, there has been little incentive to undertake the cumbersome data-collection process necessary to enumerate and estimate these uncounted public costs.

For these reasons, most existing estimates of public subsidies for sports facilities are significantly underestimated. Moreover, in studies that present comparative statistics among facility types, among leagues, or for time, these inaccuracies are compounded by inconsistencies in measurement techniques among locations. The purpose of this study is to fill this data gap by providing accurate and consistent estimates of public subsidies for all 99 major league sports facilities in use for the "big four" major league sports in 2001, as well as a set of complementary comparative statistics. I present a cost model that estimates the present value of all public subsidies for each facility, including construction, land, and infrastructure, as well as ongoing costs for operations, capital improvements, municipal services, and foregone property taxes, in 2001, based on leases in effect in 2001, and assuming 30-year lease terms.

The analysis reveals that public cost is underreported by an average of $50 million per facility, or $5 billion for all 99 facilities in use in 2001. Across leagues, the average public subsidy for a Major League Baseball (MLB) ballpark is underreported by $53 million, calculated by subtracting the average subsidy as reported by industry sources of $165 million from the adjusted subsidy of $218 million including land, infrastructure, and ongoing public costs. Comparatively, the average public subsidy for a National Football League (NFL) stadium is underreported by $41 million, versus $53 million for a National Basketball Association (NBA) arena and $46 million for a National Hockey League (NHL) arena. Among facility types, the average subsidy for a stadium is underreported by $54 million, compared to $44 million for arenas and $66 million for joint NBA-NHL arenas.

METHOD

Study Population

The analysis includes all 99 stadiums and arenas currently in use for the big four major league sports as of 2001 (Table 1). During 2001, 120 major league teams played in 100 facilities. Of these 120 teams, 20 shared facilities: Five stadiums host both MLB and NFL teams, 13 arenas host both NBA and NHL teams, 1 stadium hosts 2 NFL teams, and 1 arena hosts 2 NBA teams. Of these 100 facilities, Husky

TABLE 1: Public Subsidies for Major League Sports Facilities, Adjusted for Cost Omissions: All Facilities In Use for MLB, NFL, NBA, and NHL at 2001 (PV at 2001, Millions)

Case #	Date Opened/ Renovated	Host City	Facility Name In 2001 (Current) (R- Renovated)	Total Development Cost[a]	Reported Public Subsidy[b]	Public Subsidy After Adjustments[c]	Change in Public Subsidy	Public Share[d]
MLB Only								
1	1966/1998	Anaheim	Edison Intl. Field (R)	132	32	62	30	47%
2	1994	Arlington	Ballpark at Arlington	226	192	249	57	110%
3	1997	Atlanta	Turner Field	269	0	95	95	35%
4	1992	Baltimore	Oriole Park	221	122	195	72	88%
5	1912	Boston	Fenway Park	29	0	32	32	110%
6	1914	Chicago	Wrigley Field	18	0	25	25	141%
7	1991	Chicago	New Comiskey (US Cellular)	247	205	296	91	120%
8	1970	Cincinnati	Cinergy Field	249	185	258	72	103%
9	1994	Cleveland	Jacobs Field	328	178	359	181	109%
10	1995	Denver	Coors Field	249	226	295	69	118%
11	2000	Detroit	Comerica Park	365	116	115	(2)	31%
12	2000	Houston	Enron (Minute Maid Park)	269	217	250	33	93%
13	1973	Kansas City	Kauffman Field	119	77	158	81	133%
14	1962	Los Angeles	Dodger Stadium	186	0	66	66	36%
15	2001	Milwaukee	Miller Park	357	207	436	229	122%
16	1976	Montreal	Olympic Stadium	1,412	706	942	236	67%
17	1964	New York	Shea Stadium	161	161	115	(47)	71%
18	1923/1974	New York	Yankee Stadium (R)	309	301	269	(33)	87%
19	1998	Phoenix	Bank One Ballpark	376	269	78	(190)	21%
20	2001	Pittsburgh	PNC Park	262	239	303	64	116%

(continued)

121

TABLE 1 (continued)

Case #	Date Opened/ Renovated	Host City	Facility Name In 2001 (Current) (R- Renovated)	Total Development Cost[a]	Reported Public Subsidy[b]	Public Subsidy After Adjustments[c]	Change in Public Subsidy	Public Share[d]
21	2000	San Francisco	Pacific Bell Park	343	15	142	127	41%
22	1999	Seattle	SafeCo Field	538	430	553	124	103%
23	1966	St. Louis	Busch Stadium	160	0	96	96	60%
24	1990/1998	St. Petersburg	Tropicana Field (R)	236	191	321	130	136%
25	1989	Toronto	SkyDome	492	231	351	120	71%
Joint MLB-NFL								
26	1987	Miami	Pro Player Stadium	186	0	95	95	51%
27	1982	Minneapolis	HHH Metrodome	141	105	(107)	(212)	−76%
28	1966/1996	Oakland	Net. Assoc. Col. (R)	234	213	211	(2)	90%
29	1971	Philadelphia	Veterans Stadium	191	191	92	(99)	48%
30	1968/1997	San Diego	Qualcomm Stadium (R)	169	150	167	17	99%
NFL Only								
31	1992	Atlanta	Georgia Dome	271	252	329	76	121%
32	1998	Baltimore	PSINet (Ravens Stadium)	323	203	363	160	112%
33	1971	Boston/Foxboro	Foxboro Stadium	27	0	2	2	9%
34	1973/1999	Buffalo/Orchard Park	Ralph Wilson (R)	130	122	239	116	184%
35	1996	Charlotte	Ericsson Stadium	277	23	173	149	62%
36	1924	Chicago	Soldier Field	292	292	270	(22)	92%
37	2000	Cincinnati	Paul Brown Stadium	475	377	579	203	122%
38	1999	Cleveland	Clev. Browns Stadium	333	244	332	88	100%
39	1971	Dallas/Irving	Texas Stadium	119	119	116	(3)	97%
40	2001	Denver	Invesco Field	510	310	463	153	91%

122

#	Year	City	Venue					
41	1975	Detroit	Pontiac Silverdome	159	159	95	(64)	60%
42	1976	East Rutherford/NYC	Giants Stadium	178	178	117	(61)	66%
43	1957	Green Bay	Lambeau Field	8	8	43	35	514%
44	1983	Indianapolis	RCA Dome	119	73	141	68	118%
45	1946/1995	Jacksonville	ALLTEL Stadium	166	166	207	41	125%
46	1972	Kansas City	Arrowhead Stadium	115	83	124	41	108%
47	1999	Nashville	Adelphia (Titans) Coliseum	282	213	295	81	104%
48	1975	New Orleans	Louisiana Superdome	463	457	565	109	122%
49	1958	Phoenix/Tempe	Sun Devil Stadium	17	17	18	2	110%
50	2001	Pittsburgh	Rooney (Heinz Field)	233	196	271	75	116%
51	1958	San Francisco	3Com (Candlestick Park)	126	126	50	(76)	40%
52	1995	St. Louis	TransWorld (Ed. Jones) Dome	322	322	377	55	117%
53	1998	Tampa Bay	Raymond James Stadium	179	179	226	47	127%
54	1997	Washington	FedEx Field	270	0	101	101	37%
NBA Only								
55	1988	Charlotte	Charlotte Coliseum	81	81	76	(4)	95%
56	1994	Cleveland	Gund Arena	212	119	199	80	94%
57	1988	Detroit/Auburn Hills	Palace at Auburn Hills	97	0	25	25	25%
58	1975	Houston	Compaq Center	51	51	34	(17)	67%
59	1999	Indianapolis	Conseco Fieldhouse (R)	201	190	210	20	105%
60	1999	Miami	American Air. Arena	263	0	149	149	57%
61	1988	Milwaukee	Bradley Center	152	0	51	51	33%
62	1990	Minneapolis	Target Center	163	73	145	73	89%
63	1966/1997	Oakland	Oakland Arena (R)	162	140	93	(47)	58%
64	1989	Orlando	TD Waterhouse Center	150	150	165	15	110%
65	1995	Portland	Rose Garden	301	0	96	96	32%
66	1988	Sacramento	Arco Arena	56	0	35	35	64%
67	1991	Salt Lake City	Delta Center	130	0	79	79	61%
68	1993	San Antonio	San Antonio Dome	224	224	265	41	118%
69	1970s/1995	Seattle	Key Arena	137	86	105	19	77%

(continued)

123

TABLE 1 (continued)

Case #	Date Opened/ Renovated	Host City	Facility Name In 2001 (Current) (R- Renovated)	Total Development Cost[a]	Reported Public Subsidy[b]	Public Subsidy After Adjustments[c]	Change in Public Subsidy	Public Share[d]
Joint NBA-NHL								
70	1999	Atlanta	Philips Arena	222	136	160	24	72%
71	1995	Boston	Fleet Center	185	0	84	84	46%
72	1994	Chicago	United Center	238	0	60	60	25%
73	2001	Dallas	American Airlines Arena	380	125	220	95	58%
74	1999	Denver	Pepsi Center	187	0	61	61	33%
75	1981	East Rutherford	Continental Air. Arena	151	151	64	(88)	42%
76	1999	Los Angeles	Staples Center	415	0	193	193	46%
77	1968/1991	New York	Madison Sq. Garden (R)	260	0	77	77	30%
78	1996	Philadelphia	First Union Center	243	0	114	114	47%
79	1992	Phoenix	America West Arena	118	35	77	42	66%
80	1999	Toronto	Air Canada Center	216	0	25	25	11%
81	1995	Vancouver	General Motors Place	129	0	25	25	19%
82	1997	Washington	MCI Center	280	0	152	152	54%
NHL Only								
83	1993	Anaheim	Arrowhead Pond	145	145	72	(73)	50%
84	1996	Buffalo	HSBC Arena	137	60	129	69	94%
85	1983	Calgary	Pengrowth Saddledome	191	191	178	(12)	94%
86	2000	Columbus	Nationwide Arena	152	0	62	62	41%
87	1979	Detroit	Joe Louis Arena	57	57	82	25	145%
88	1974	Edmonton	Skyreach Center	148	148	179	31	121%

124

89	1998	Miami	Natl. Car (Office Depot) Arena	225	196	272	75	121%
90	2000	Minneapolis/St. Paul	Xcel Energy Center	131	96	82	(14)	62%
91	1996	Montreal	Le Centre Molson (Bell)	180	0	25	25	14%
92	1997	Nashville	Gaylord Ent. Center	155	155	164	8	105%
93	1972	New York/Uniondale	Nassau Vets. Mem. Col.	100	100	126	25	125%
94	1996	Ottawa/Kanata	Corel Center	163	0	30	30	19%
95	1961	Pittsburgh	Mellon (Civic) Arena	163	163	179	15	109%
96	1999	Raleigh	Raleigh Sports (RBC) Arena	160	139	167	28	104%
97	1993	San Jose	San Jose Arena (HP Pavillion)	196	160	214	54	109%
98	1994	St. Louis	Savvis (Kiel) Center	198	0	107	107	54%
99	1996	Tampa	Ice Palace (St. Pete's Times)	162	100	167	67	103%

a. Total development cost is the sum of all land, building, and infrastructure costs, including soft costs such as fees and financing.

b. Amount of public subsidy reported in team and industry publications.

c. Total public subsidy after adjusting for land, infrastructure, net annual costs, and forgone property taxes.

d. Total public subsidy divided by total development cost. Public share outcomes below 0% indicate that public participation in ongoing facility operations has more than repaid upfront public development costs. Outcomes more than 100% indicate that public participation in ongoing facility operations does not repay upfront public development costs; instead, it presents additional public expenses.

125

Stadium in Seattle, Washington, is eliminated from the population because it is only in use during the interim period between the demolition of the Kingdome and the opening of the new NFL Seahawk's stadium. I also consider the subset of 65 "new" facilities opened after 1990 to illustrate recent and emerging trends.

Public Cost Model

Measuring public subsidies for sports facilities, beyond industry reports of construction costs, is the subject of only a limited number of academic studies (Baim, 1994; Okner, 1974; Quirk & Fort, 1997; Rosentraub, 1997). These studies borrowed from financial models used to evaluate other types of public investments. Okner (1974) pioneered the measurement of operating subsidies and pointed specifically to the issue of foregone property taxes. Baim (1994) applied the analytical technique of net present value to measure cumulative annual subsidies over a period of years. Quirk and Fort (1997) argued that the public investment in sports facilities should be determined by following the same rules that govern private development. Rosentraub (1997) provided an *ex ante* cost-estimation model that forecast both the public's capital and operating costs during the life of the lease, expressed as a present value. Although each study provides insights for the construction of a comprehensive cost model, they are generally less useful in the context of the complex deal structures and lease arrangements prevalent during the 1990s, with the important exception of Rosentraub's study of the Cleveland Gateway complex. Pragmatically, data from these studies are of limited use for this study, either because the facilities have since been replaced or because they consider a relatively small sample.

The cost model presented here draws on this earlier work and is designed to consistently and accurately count the total public subsidy for all types of major league sports facilities, adjusting for the omitted subsidies. I estimate the total public subsidy by calculating the present value (PV) of all public costs including public development costs (building, land, and infrastructure), annual public costs (maintenance, capital improvements, and municipal services), net of annual public revenues (rent and other revenue sharing as specified in the lease), and foregone property taxes for an average 30-year lifespan, discounted to 2001. The discount rate is 7%, the average return on 30-year government bonds at 2001, to reflect the public cost of capital for a term similar to the life of the project.[1]

The model includes three adjustments for uncounted public costs: (a) land and infrastructure, (b) net annual public cost, and (c) foregone property taxes. Accordingly, total public subsidy is the sum of the present value at 2001 of public development, net annual public costs, and foregone property taxes (Equation 1).

$$PV_{2001} \text{ Public Subsidy (\$)} = \quad PV_{2001} \text{ Public Development Cost} \quad (2)$$
$$+ PV_{2001} \text{ Net Annual Public Cost} \quad (3) \quad (1)$$
$$+ PV_{2001} \text{ Foregone Property Taxes} \quad (4)$$

The first adjustment, *public development cost*, estimates the present value of all public expenditures for building, land, and infrastructure, adjusted to 2001 using the Construction Cost Index (CCI) and an average inflation adjustment of 3.5% for the land component (Equation 2). The second adjustment, *net annual public cost*, estimates the present value of all annual public expenses (maintenance, capital improvements, and municipal services), minus the sum of all annual public revenues (base rent, ticket surcharges, and shares of revenues from gate, premium seating, concessions, advertising, naming rights, parking, other major league tenants, and other tenants), based on lease terms in effect in 2001 and discounted to 2001 based on an average lease duration of 30 years (Equation 3). The third adjustment, *foregone property taxes*, is estimated at 2% of replacement value, incurred during a 30-year lease and discounted to 2001 (Equation 4).

Adjustment #1: Public Development Cost

The first adjustment captures uncounted public costs for the development of the facility, focusing on land and infrastructure. *Public development cost* is the sum of the present value of all public expenditures for building, land, and infrastructure, adjusted to 2001 using the CCI and an average inflation adjustment of 3.5% for the land component (Equation 2). Although development costs typically occur in the 5-10 years prior to the facility opening, for simplicity they are treated as occurring the year of opening.

$$PV_{2001} \text{ Public Development Cost (\$)} = \quad \begin{aligned} &PV_{2001} \text{ Public Building Cost} \\ &+ PV_{2001} \text{ Public Land Cost} \\ &+ PV_{2001} \text{Public Infrastructure Cost} \end{aligned} \quad (2)$$

Public building cost is defined as total public hard costs (materials, labor) and soft costs (financing, fees), including cost overruns, adjusted to 2001 using the CCI. Among all public costs for new sports facilities, the cost of constructing the building itself is generally the most accurate and accessible data, with the exception of renovations and overruns. Only renovations totaling more than $50 million (in 2001 dollars) are included; otherwise, the data-collection process would be stymied by small-scale improvements undertaken almost every season. Cost overruns are reported where reliable data are available, but determining the nature and magnitude of cost overruns for some recently opened facilities was problematic, particularly if responsibility for the additional costs is in dispute.

Public land cost is defined as the market value of the land, as determined by public or independent sources, adjusted to 2001 using an average annual inflation rate of 3.5%. Regardless of whether the land stays in public ownership, if it was provided by the public sector, its cost is counted as a charge against the facility. For renovated facilities, public land cost is estimated at 25% of the original cost adjusted to

2001, because many of these renovated facilities were originally built during the 1960s and 1970s, when land and infrastructure costs were in the range of 10 to 30% of total cost. Land salvage value is not included as the terminal variable in the present value analysis because it is difficult to appraise the future value of defunct sports facilities in a meaningful way. In part, this is because the rate of appreciation varies between markets depending on local conditions. Additionally, although most sites gain value via assembly and improvements, the appropriate adaptive reuses for former sports facility sites are not yet clear. Finally, demolition costs can be unpredictable and can significantly offset gains in land appreciation.

Public infrastructure cost is defined as road, highway, transit, water, sewer, and other improvements built partly or fully to support a sports facility project, adjusted to 2001 using the CCI. During the 1980s and 1990s, infrastructure costs began to disappear from facility cost reports, in part because it is difficult to disentangle benefits to the sports facility from those enjoyed by adjacent sites and also because taxpayers are less likely to question infrastructure spending because it is generally perceived as a legitimate function of local governments, especially if the facility is deliberately sited in an underused urban area. Public infrastructure costs in the vicinity of a new sports facility are charged exclusively to the facility when *but for* the facility, the improvement would not have been made. Facilities located within a complex of two or more facilities are apportioned infrastructure costs based on site area.

Building, land, and infrastructure cost data are cross-referenced from different sources, including academic case studies[2] (Baim, 1994; Keating, 1999; Noll & Zimbalist, 1997; Quirk & Fort, 1997; Rosentraub, 1997), industry publications[3] (Greenberg, 2000; Petersen, 1996; Team Marketing Report, 2001), general interest publications[4] (Benson, 1989; Gershman, 1993; Lowry, 1986; Reidenbaugh, 1983) and Lexis/Nexis searches of major newspapers and periodicals for each facility.

Adjustment #2: Net Annual Public Cost

The second adjustment captures uncounted annual public cost (net of revenues) for the life of the facility. Many governments require that teams make rental payments and share profits to offset the initial public investment. In general, the public sector participates in facility revenues and expenses only when it owns the facility, as is the case for 67 of the 99 facilities studied.[5] This income should be credited against the public cost but must be net of public expenses, including maintenance, capital improvements, municipal services, and other operating expenses. Accordingly, *net annual public cost* is the sum of all annual public expenses, including maintenance, capital improvements, and municipal services, minus the sum of all annual public revenues, including base rent, ticket surcharges, and shares of revenues from gate, premium seating, concessions, advertising, naming rights, parking, other major league tenants, and other tenants, based on lease terms in effect in 2001

and discounted to 2001 based on an average lease duration of 30 years (Equations 3, 5, and 6).

$$PV_{2001} \text{ Net Annual Public Cost (\$)} = \begin{array}{l} (PV_{2001} \text{ Public Revenues (5)} \\ - PV_{2001} \text{ Public Expenses) (6)} \end{array} \qquad (3)$$

where

$$PV_{2001} \text{ Public Revenues (\$)} = \begin{array}{l} PV_{2001} \text{ Base Rent} \\ + PV_{2001} \text{ Ticket Surcharges} \\ + PV_{2001} \text{ Share of Total Facility Revenues} \\ + PV_{2001} \text{ Share of Gate} \\ + PV_{2001} \text{ Share of Premium Seating} \\ + PV_{2001} \text{ Share of Concessions} \\ + PV_{2001} \text{ Share of Advertising} \qquad (5) \\ + PV_{2001} \text{ Share of Naming Rights} \\ + PV_{2001} \text{ Share of Parking} \\ + PV_{2001} \text{ Share of Other ML Tenant Revenues} \\ + PV_{2001} \text{ Share of Other ML Revenues} \\ + PV_{2001} \text{ Share of Non-ML Revenues} \end{array}$$

and where

$$PV_{2001} \text{ Public Expenses (\$)} = \begin{array}{l} PV_{2001} \text{ Share of Maintenance} \\ + PV_{2001} \text{ Share of Capital Improvements} \\ + PV_{2001} \text{ Municipal Services Expenses} \qquad (6) \\ + PV_{2001} \text{ Share of Other Expenses} \end{array}$$

Net annual public cost is treated as occurring during a 30-year period because it approximates the average lease length for all facilities currently in use in 2001 and because public owners often seek to match the value of the asset (the team and its revenues) with the duration of the debt. Furthermore, I assume that the lease provisions in 2001 represent a stabilized year in the lease, and I make adjustments for inflation or changes in payments in only if specified in the provisions as in 2001. Given that leases are rarely renegotiated unless extended, those in effect in 2001 are a fair representation of the lease in its entire length. Practically, this assumption allows the use of 2001 cost data for items such as ticket prices, attendance, and concession prices as the basis of revenue projections.

Annual public revenue and expense data are cross-referenced from industry publications (Greenberg, 2000; Petersen, 1996; Team Marketing Report, 2001) and selected academic studies (Danielson, 1997; Forsythe, 2000; Noll & Zimbalist, 1997; Rosentraub, 1997).[6] Of particular importance to this study is *Inside the Own-*

ership of Professional Sports Teams, an annual publication by Team Marketing Report, Inc. (TMR), that provides a summary of the lease details for each facility including the start date and duration, the base and percentage rent, the naming rights deal, premium seating information, and average attendance for the past 5 years. Another TMR product, the *Fan Cost Index* , estimates the average cost for a family of four to attend a major league game (for all four sports) at each facility, including four average-price tickets, four small soft drinks, two small beers, four hot dogs, two game programs, parking for one vehicle, and two adult-size caps.

Annual Public Revenues

Annual public revenues are organized into 12 categories based on commonalities in lease structure including base rent, ticket surcharges, and shares of revenues from gate, premium seating, concessions, advertising, naming rights, parking, other major league tenants, and other tenants, based on lease terms in effect in 2001 and discounted to 2001 based on an average lease duration of 30 years (Forsythe, 2000; Equation 5).

Base rent is expressed as a dollar fee, per year or per game, and may also include other types of revenues such as ground lease payments. During the life of the lease, base rent may remain unchanged or may increase or decrease each year by a fixed amount or percentage, and it may be adjusted for inflation using a standard index such as the CPI. To estimate base rent expressed per game, the annual payment is calculated based on regular-season games only, because postseason participation is difficult to predict and is often subject to more restrictive public revenue sharing. To estimate rent under "greater/lesser of" conditions, I use the average ticket price in 2001 and average attendance during the past five seasons (1996-2001). In some cases, teams may pay a fixed fee not expressly labeled rent, which may or may not extend for the life of the lease. Finally, teams playing in privately owned facilities that are sited on public land might be required to make ground lease payments. Because all teams share some percentage of gate receipts with visiting teams, it is assumed that net outflows to visiting teams roughly equal net inflows from away games.

Ticket surcharges, or ticket taxes, are per-ticket fees added to the ticket price, which are collected by the team for remittance to the public sector in a manner similar to a sales tax. Ticket surcharges are typically expressed as a flat charge per ticket or as a percentage of the ticket face value, and are sometimes scaled to attendance. Annual ticket-surcharge revenues are estimated based on average attendance for the past five seasons.

Share of total facility revenues is a relatively rare lease arrangement by which the public sector shares in the total revenues earned at the facility, expressed as percentage rent. The annual share of total facility revenues is estimated based on the corresponding annual estimates for the 11 other revenue line items.

Share of gate is the public share of all tickets sold for game events, but not including club seats or luxury suites (which are considered premium seating; see below), expressed as a simple percentage or as a percentage scaled to attendance, and may include a guaranteed minimum. Share of gate is estimated based on average attendance throughout the past five seasons.

Premium seating is the public share of revenues from luxury suites, club seats, and party suites rented on a per-game basis, typically expressed as percentage rent with suite and club seat revenues handled separately. Share of premium seating is estimated based on 2001 fees and assumes a 100% occupancy rate.

Concessions revenues are public revenues from all food, beverage, and novelty item sales, typically expressed as percentage rent. Concession revenues are estimated based on the 2001 *Fan Cost Index* concession and merchandise components, and are based on the average attendance for the past five seasons, assuming a 40% profit margin.

Advertising revenues are public revenues derived from interior signage; it is, however, relatively rare for a public landlord to negotiate a substantial share of advertising revenues. The ability to attract advertising is intrinsic to the draw of the tenant rather than to the facility itself, and consequently, advertising revenue data are generally considered proprietary. To estimate advertising revenues when they are shared with the public sector, it is possible to make educated assumptions based on data that are publicly available, adjusting for league, market size, and facility type. For MLB, NFL, and NBA teams in large markets and new facilities, advertising revenue estimates in the $6 million range are appropriate based on an assessment of facilities for which such data are available. For NHL teams, and MLB, NFL, and NBA teams in smaller markets and older facilities, estimates in the $3 million range are more appropriate.

Naming rights are public revenues from the sale of exterior signage. Typically, naming rights are sold for a period of 5 to 30 years, with the average between 15 and 20 years, with payments made on an annual basis. It is not unusual for the public sector to share some percentage of annual naming rights revenues, and these are estimated assuming that fees are paid in equal installments for the duration of the deal.

Parking revenues are public revenues collected for major league events and only for stalls on the same site as the facility. In general, the public share of parking revenues is expressed as percentage rent, but in some cases, the team may pay a flat fee per year for the right to operate parking on game days or for all events during the year. Parking revenues are estimated assuming a game-day occupancy rate of 100%.

Other major league tenant revenues are payments made to the public sector from another major league team sharing the facility. In 2001, there were 18 facilities shared by two major league teams. For each of these facilities, both leases are considered in determining public revenues and expenses. For facilities that were

formerly shared but are now single-use, an estimated share of public revenues is included for each year that the second team played there.

Other major league revenues are public revenues not covered in the above line items. An example is the rare case in New York City, where public stadium landlords share in baseball broadcast revenues. These revenues are estimated on a case-by-case basis.

Non–major league revenues are public revenues from other events at the facility, including other sports events, such as Major League Soccer or the WNBA, and nonsport events such as concerts. The public share of non–major league revenues is typically expressed as a percentage and may be restricted to specific types of events (such as those of a civic nature) or specific revenue streams (such as gate and parking). I estimate non–major league revenues assuming that every facility earns an average of $2 million per year in net revenues from non–major league events. In reality, this revenue stream will vary depending on the facility type (arenas book more non–major league events than stadiums), the local demand for events, and the local supply of public assembly facilities, and may vary substantially from year to year. By keeping this line item constant among facilities, however, the focus on the impact of major league tenants is retained, which is appropriate given that it is these primary tenants who drive new facility construction decisions.

Annual Public Expenses

Annual public sector expenses are organized into four categories based on commonalities in lease structure including maintenance, capital improvements, municipal services, and other public expenses, based on lease terms in effect in 2001 and discounted to 2001 based on an average lease duration of 30 years (Equation 6).

Maintenance expenses are those public costs associated with keeping the facility ready for use including cleaning, trash removal, landscaping, and some ongoing operating expenses (utilities, insurance, administration) but unless specified does not include game-day expenses paid by the team. Maintenance cost data for private facilities are generally not available due to its propriety nature, and public facilities data available in summary form are at least one decade out of date: Baim (1994) provided data up to 1991, and Quirk and Fort (1997) provided data from 1989. Consequently, it is necessary to make educated assumptions about maintenance expenses. Maintenance costs differ among facility types and leagues according to such factors as the number of home games per year, whether or not the facility is shared, the age of the facility (because "new" does not necessarily imply reduced operating costs), and the nature of the local climate. Based on discussions with industry analysts and a review of a small sample of facilities, annual average maintenance are estimated as follows: For new MLB facilities, average annual maintenance expenses are estimated at $3 million per year, and if the facility has a roof, $4 million per year. For older MLB facilities, the estimated average is $2 million per

year, and $3 million if it has a roof. For new NFL facilities, because they have fewer game days than any other facility type, it is estimated that average annual mainte- nance expenses are $2 million per year, $3 million if it has a roof. For older NFL sta- diums, expenses are $1 million per year, or $2 million if it has a roof. If a stadium is used for both MLB and NFL teams, or for two NFL teams, $1 million per year is added. For all arenas, I assume annual maintenance costs of $2 million per year, only slightly lower than stadiums because of its smaller capacity and fixed roof.[7]

Capital improvements are public expenses for repairs above those included in general maintenance. In a manner similar to replacement reserves, annual pay- ments are made into the capital improvements fund, which can be drawn on for spe- cific projects subject to the approval process set out in the lease. The public share of these expenses is typically expressed as a percentage but can also be expressed as a flat fee. To estimate capital improvement expenses, an average payment of $1 mil- lion per year is assumed, which is consistent with provisions in many current leases (Forsythe, 2000).

Municipal services are public expenses incurred by the host locality that are a direct result of the operation of the facility, including police, fire, water, and sewer costs. The public is typically responsible for 100% of municipal service expenses. I estimate the cost of municipal services at $2 million per year for all facilities, a con- servative estimate because these costs generally range from $2 million to $5 million per year (Andrew Zimbalist, personal communication, 2002).

Other public expenses are public subsidies specified in lease or other agree- ments that are not covered by maintenance, capital improvements, and municipal services. The State of Florida, for example, established a special fund to attract new major league franchises, promising annual sales tax rebates of up to $2 million per year for stadium-related expenses. These other public expenses are handled on a case-by-case basis.

Adjustment #3: Foregone Property Tax Revenues

The third adjustment captures the significant and uncounted public opportunity cost associated with either keeping land on which a facility sits in public ownership, or granting private owners a property tax exemption. *Foregone property taxes* are estimated as an annual cost occurring for a 30-year period, discounted to present value at 7% in 2001 (Equation 4). Because most of these facilities are publicly owned and have never been assessed for tax purposes, I estimate foregone property tax revenues as 2% of the replacement cost of the facility in any given year (Quirk & Fort, 1997, p. 171). Replacement value is estimated on the basis of the original cost at the year of opening (including land, infrastructure, and building), adjusted to cur- rent dollars using the construction cost index, including the cost of major renova- tions more than $50 million also adjusted to the current dollars, less accumulated depreciation, calculated on a base of 40 years using the straight-line method.

Comparing Subsidy Outcomes

Subsidy outcomes among locations, facility types, and leagues are compared by measuring the share of total costs paid by the public sector (*public share*) relative to that paid by the private sector, indicating the nature of the underlying public-private partnership. *Public share* (Equation 7) is defined as the total public subsidy (Equation 1) divided by total development cost (Equation 8).

$$\text{Public Share (\%)} = \frac{PV_{20001} \text{ Public Subsidy} \quad (1)}{/ PV_{2001} \text{ Total Development Cost} \quad (8)} \quad (7)$$

where

$$PV_{2001} \text{ Total Devp. Cost (\$)} = \begin{array}{l} PV_{2001} \text{ Total Cost Building} \\ + PV_{2001} \text{ Total Cost Land} \\ + PV_{2001} \text{Total Cost Infrastructure} \end{array} \quad (8)$$

Public share is the preferred measure for comparisons because it indicates the relative responsibility between the public and private sectors while controlling for physical differences in facilities across jurisdictions. For example, if the public paid $100 million toward a $200 million facility, the public share is 50%; one can then compare public share outcomes as "apples to apples"—a 50% public share in City A versus a 75% public share in City B—without resorting to endless adjustments for capacity, amenities, and other facility- and location-specific characteristics.

There are two important caveats to the use of the public share measure. First, the numerator includes both development and annual costs, whereas the denominator includes only development costs. The difference arises from the objective of accounting for those instances when public participants earn net income from facility operations that are intended to either directly or indirectly service any publicly issued development debt, sometimes referred to as *lease give-backs*. As conceptualized, the public share formula takes into account the degree to which facilities "pay for themselves" from the public sector perspective. If parity in terms for both the numerator and denominator were the goal, the resulting measure would be the public subsidy relative to total cost for both capital and operating components. The construction of such a measure, however, is neither feasible nor desirable. It is not feasible because although the calculation of total capital costs is straightforward, the calculation of total operating income for the life of the facility is not. Such calculations would require major league tenants to make public highly sensitive proprietary information, which they have been traditionally reluctant to do. Furthermore, the operation of the facility is only one profit center for teams, and it would be difficult to apportion overall revenues such as broadcast rights or expenses such as player salaries to the facility component. Also, teams may seek to minimize tax lia-

bilities by forming a separate entity for the facility component of their operations or by structuring the entire franchise as a subsidiary of a larger corporation, further complicating the task of identifying operating income for the facility. Finally, it would be very difficult to construct such a denominator, and even if one could, for a 30-year operating period it is likely that a proper accounting for operating income would completely offset the development cost, resulting in a zero or negative denominator. Even if it were possible to construct such a measure, it would not be desirable for the purposes of this study. Because the goal is defensible comparisons between locations, the inclusion of total facility income in the denominator would reintroduce the significant variability of team profitability between locations.

Second, public share outcomes can fall outside the range of 0% to 100%. Public shares less than 0% indicate that the public sector has more than offset its initial investment through annual revenues. Conversely, public shares greater than 100% indicate that the public sector has not paid back any of the upfront development costs through facility operations and instead is continuing to pay out additional subsidies year after year.

FINDINGS AND DISCUSSION

The real cost of public subsidies for sports facilities is significantly higher than commonly reported, and, as a result, governments and taxpayers underestimate the magnitude of their ongoing financial commitment. Specifically, land and infrastructure costs, the annual public costs associated with the operation of the facility, and foregone property taxes are routinely ignored. I estimate that the real cost of public funding is underreported by an average of $50 million per facility, representing a 40% increase in the total public cost (Table 2). Whereas industry sources report an average public subsidy of $125 million per facility based on a total development cost of $222 million, I estimate the average public subsidy at $175 million. For all 99 facilities, I estimate the total value of the underreported public subsidy at $5 billion. More worrisome is that the gap between reported and actual costs is widening: For the 65 new facilities opened between 1990 and 2001, the average uncounted public cost increases to $71 million per facility, bringing the average public subsidy to $195 million based on a total development cost of $242 million.

Land and infrastructure costs are unreported in 46 of 99 cases, and their omission accounts for $17 million toward the total $50 million in uncounted public costs (Table 2). The omission of these costs from facility cost data is a recent phenomenon. In the 1960s and 1970s, land and infrastructure costs were typically included in the cost reports for new sports facilities because of progressive attitudes toward civic improvements in growing cities and counties, the exclusive control of governments over the projects, as well as the low cost and high availability of large parcels of land in the suburbs. These costs began to disappear from facility cost reports during the 1980s and 1990s when it became fashionable to site new sports facilities in urban locations. Land costs soared as extensive site-selection processes were

TABLE 2: Average Public Subsidy and Public Share, by Facility Type: All Facilities In Use In 2001, and Facilities Opened After 1990 (PV at 2001, Millions)

Data Set	Average Total Development Cost	Average Reported Public Subsidy	Adjustment #1 Land & Infrastructure	Adjustment #2 Net Annual Public Expenses	Adjustment #3 Foregone Property Taxes	Average Adjusted Public Subsidy	Average Change in Public Subsidy
ALL FACILITIES ($t = 99$)	222	125	17	(10)	43	175	50
Average Public Share		56%				79%	23%
Opened 1990+ ($t = 65$)	242	124	24	(1)	48	195	71
Average Public Share		51%				80%	29%
STADIUMS ($t = 54$)	257	168	20	(17)	51	222	54
Average Public Share		65%				87%	21%
Opened 1990+ ($t = 30$)	286	187	29	(7)	60	269	82
Average Public Share		65%				94%	29%
ARENAS ($t = 45$)	179	73	14	(1)	32	118	45
Average Public Share		41%				65%	25%
Opened 1990+ ($t = 33$)	202	66	18	3	39	126	60
Average Public Share		33%				62%	30%
SHARED ARENAS ($t = 13$)	233	34	26	1	39	100	66
Average Public Share		15%				43%	28%
Opened 1990+ ($t = 12$)	240	25	28	16	41	110	85
Average Public Share		10%				46%	35%

undertaken, followed by piecemeal assembly via eminent domain (including the cost of resolving attendant lawsuits), the relocation of existing residents and businesses, and, in some cases, environmental remediation. Land cost data are tricky because of the complexity of appraising these sites, and because both team owners and some government officials have an interest in suppressing public knowledge of the market value of the site should it be sold privately. Infrastructure costs are also less likely to be reported because it is difficult to disentangle benefits to the sports facility from those enjoyed by adjacent sites, especially when bundled with other high-profile civic improvements, and also because taxpayers are less likely to question infrastructure spending because such projects continue to be perceived as a legitimate function of local governments. For these reasons, the tendency of subsidy advocates to obscure these costs is likely to continue. As evidenced, the average uncounted public cost of land and infrastructure for new facilities opened between 1990 and 2001 increases to $24 million per facility (Table 2).

Annual public costs paid each year toward the operation of a facility are also uncounted in most cases. It is not unusual to find projected annual public revenues, such as naming rights payments, capitalized and subtracted from public cost estimates (a useful accounting tactic during the public review process) or pledged to debt service payments. On this basis, public subsidy advocates claim that new sports facilities can pay for themselves through rent payments and other forms of revenue sharing, while omitting the corresponding ongoing public expenses. The good news is that among all 99 facilities in use in 2001, I estimate that the public sector generally makes money by participating in sports facility operations, with revenues exceeding expenses by an average of $10 million per facility, measured during 30 years, discounted to 2001 (Table 2). The bad news is that this public gain is largely derived from older stadiums where the operating agreements were negotiated during the 1970s, a time when public landlords were able to negotiate a generous share of most stadium revenues and, in many cases, doubled their revenues by signing both an MLB and NFL tenant. By 1990, the public sector is only breaking even on facility operations, with an average gain of $1 million in net revenues estimated for 30 years, discounted to 2001. Moreover, these gains are primarily linked to public participation in the operation of MLB ballparks, which is in part attributable to the high level of taxpayer scrutiny aroused by these deals (Table 3). For newer facilities in other leagues, the public sector is generally losing money from operations. It is a myth that sports facilities' operating revenues repay construction debt. In reality, operating revenues are almost completely offset by significant ongoing public expenses that are obscured in complex lease agreements.

Sports facilities rarely yield property taxes for their municipal hosts, and these foregone revenues represent a significant and uncounted public cost. Their omission accounts for $43 million toward the total $50 million in uncounted public costs (Table 2). A facility need not be publicly owned to avoid paying property taxes: Eighty-five cases receive property tax exemptions, whereas only 67 are publicly owned. Many cities offer exemptions to privately owned facilities on the grounds

TABLE 3: Average Public Subsidy and Public Share, by League: All Facilities In Use In 2001, and Facilities Opened After 1990 (PV at 2001, Millions)

Data Set	Average Total Development Cost	Average Reported Public Subsidy	Adjustment #1 Land & Infrastructure	Adjustment #2 Net Annual Public Expenses	Adjustment #3 Foregone Property Taxes	Average Total Public Subsidy	Average Change in Subsidy Level
MLB ($t = 30$)	282	165	23	(25)	55	218	53
Average Public Share		59%				77%	19%
Opened 1990+ ($t = 17$)	284	177	29	(20)	57	243	66
Average Public Share		62%				86%	23%
NFL ($t = 29$)	218	165	15	(20)	46	206	41
Average Public Share		76%				94%	19%
Opened 1990+ (($t = 15$)	278	198	27	3	60	288	90
Average Public Share		71%				104%[1]	32%
NBA ($t = 28$)	193	56	21	(3)	35	109	53
Average Public Share		29%				56%	27%
Opened 1990+ (21)	222	54	27	5	42	128	74
Average Public Share		24%				58%	33%
NHL ($t = 30$)	190	72	13	1	32	118	46
Average Public Share		38%				62%	24%
Opened 1990+ (24)	203	56	16	8	37	117	61
Average Public Share		28%				58%	30%

NOTE: Public share outcomes in excess of 100% indicate that public participation in ongoing facility operations does not repay upfront public development costs; instead it presents addtional public expenses.

that regardless of ownership, sports facilities are used for a public purpose. This premise is currently being challenged in Florida, where efforts are underway to restrict cities from offering exemptions to sports facilities. Some cities are responding with threats to transfer facilities to county ownership to bypass the impact of the proposed legislation. In a few cases, public owners do require their tenants to pay property taxes, as is the case at most facilities located in Canada. In others, teams are required to make payments in lieu of property taxes (PILOT) through ticket surcharges and admissions taxes or alternate forms of revenue sharing. The preceding adjustment for net annual costs shows, however, that the public sector is barely making a profit from operations before making the adjustment for property tax exemptions. Consequently, PILOTs would have to increase dramatically to offset the substantial opportunity cost of foregone property taxes.

Overall, the findings refute the much-touted claim that during the 1990s, team owners and other private entities were "partners" in sharing the burden of facility financing with taxpayers. Instead, the analysis shows that upfront private contributions are often substantially recouped through lease-based subsidies and exemptions from property taxes. Although industry sources estimate that the average public share of costs for a new sports facility is 56%, my findings show that after adjusting for omitted subsidies, the average public share is 79%—an increase of 23 percentage points (Table 2).

The effect of adding these uncounted public costs among all 99 facilities is to shift the distribution of public share outcomes away from private responsibility and toward public responsibility. Starting with data from industry sources, 27 facilities are reported as fully privately paid for (0% public share), 42 are reported as fully publicly paid for (100% public share), and the remaining 30 are categorized as public-private partnerships with varying public shares. After making adjustments for uncounted public costs, however, only 1 of the original 27 private facilities remains categorized as fully privately funded (Table 1). The number of fully publicly funded facilities increases by 10, from 42 to 52. Of these, 38 facilities report public shares in excess of 100%, meaning that the public subsidy exceeds the total development cost—that is, public participation in the lease leads to additional public costs rather than repaying them, as is often the intent. The remaining 46 facilities are classified as public-private partnerships, reporting public shares between 1% to 99%, with an average public share of 79%. Thus, characterizing recent deals as public-private partnerships is inaccurate, in as much as it implies near-equal responsibility between both sectors, and taxpayers continue to bear the majority of costs for constructing and operating new major league sports facilities.

If governments and taxpayers understood the real cost of public subsidies for major league sports facilities, they could make better investment decisions. This analysis demonstrates that it is possible to reliably estimate the total public cost of a new stadium, ballpark, or arena, including both development and ongoing costs for the life of the facility, in advance of subsidy negotiations. For a number of reasons, however, the task of estimating costs is not best left to those directly involved in the

subsidy negotiation. Subsidy advocates—including team owners, players' unions, trade unions, local media, businesses, and real estate developers—have an interest in underreporting the cost of a new facility to ensure favorable and rapid public approval. Politicians and other public officials aligned with the interests of subsidy advocates can be complicit in keeping the real public cost out of the debate. Finally, the complex nature of most financing and lease agreements means that only the most diligent of public interest groups will have sufficient expertise to interpret the nature and magnitude of the total public subsidy. Thus, it falls to the academy to monitor subsidy deals and to demand the *ex ante* analyses and increased transparency that will lead to better decision making.

NOTES

1. Because only public revenues and expenses are included, the discount rate selected corresponds to the public cost of capital rather than to the private cost, as is done in earlier work by Baim (1994) and Rosentraub (1997). It should, however, be acknowledged that going forward, inflation is not predicted to be as high as it has been in the past. At the same time, treasury issuances are risk-free, whereas the revenue flows from sports facilities are less certain. Specifically, Baim created a set of discount rates based on Treasury bond yields as the measure of risk-free return, measured at January of each year of the cash flows, plus a risk premium beta computed in standard fashion from the correlation of stadium returns to market returns. Because, however, Baim had actual historical data, this approach was feasible; for projected cash flows, it is less so, particularly for such a large population. Quirk and Fort (1997) used 10% based on historical market returns, which was appropriate given their modeling goal of determining market level rent. Rosentraub (1997), in studying cash flows from the Cleveland Gateway complex, used 8.75%, but provided no rationale for its selection.

2. Academic publications often provide cost (and sometimes public subsidy) data for large samples of sports facilities, most notably *Pay Dirt* (Quirk & Fort, 1997), *The Stadium as a Municipal Investment* (Baim, 1994), and *Sports Pork: The Costly Relationship Between Major League Sports and Government* (Keating, 1999). Quirk and Fort (1997) presented a table listing the costs of all major league facilities in use in 1991; they do not, however, provide public share data, and they often do not provide sources. Baim (1994) provided total cost and public share data for 14 older stadiums, with many additional cases covered in his doctoral dissertation (1988). Baim's work has the virtue of citations from primary source materials. Keating (1999) provided the most comprehensive list, including cost and public-share data for 167 facilities built from 1887 to 1999. Although not a completely comprehensive listing (more than 50 facilities are not included), Keating was one of the first to provide sources for his cost data. In many cases, however, the references were open-ended. For example, he cited Quirk and Fort (1997), who, in turn, did not always provide sources for their cost observations. Moreover, my review of Keating's data indicates a number of errors, likely attributable to journalistic sources. I have corrected these as they occur and when better sources are available (in a few cases, better data are not available). A subsequent study of trends in public subsidies for sports facilities by Siegfried and Zimbalist (2000) is not singled out as a source of cost data because its quantitative analysis is based on Keating's data. Finally, there are a number of excellent single-facility or single-city case studies, such as those found in Euchner (1993), Danielson (1997), Noll and Zimbalist (1997), Rosentraub (1997), and Rich (2000), which provide superior cost data and are sourced to academic standards.

3. Industry publications are the most comprehensive source of data for facilities currently in use, notably *Inside The Ownership of Professional Sports* (Team Marketing Report, 2001), *The Stadium Game* (Greenberg, 2000), and the *ULI Guide to Sports, Convention, and Entertainment Facilities* (Petersen, 1996). Although industry publications are generally good sources for ownership, capacity,

and market data, they are less reliable for development cost and public share information, and they tend not to report historical data. The exception is the *ULI Guide*, which provides good cost and public-share data but only covers a relatively small number of major league facilities currently in use. An updated version of the ULI industry handbook was pubished in 2001.

4. General-interest publications are also a source of facility and public cost data, but because they are written for a lay audience, they have little need for cost precision, and consequently, these data are unreliable. Additionally, most of these publications are dedicated to ballparks, notably *Green Cathedrals* (Lowry, 1986), *The Sporting News: Take Me Out to the Ball Park* (Reidenbaugh, 1983), *Ballparks of North America* (Benson, 1989), and *Diamonds: The Evolution of the Ballpark* (Gershman, 1993). There are few general interest publications for football stadiums and for basketball and hockey arenas.

5. In 12 of these 67 cases, publicly owned facilities host more than one "big four" major league team and thus may also participate in the revenues and expenses for that team. In 6 of these 12 cases, the public owner participates in the revenues and expenses for both tenants. Additionally, for 5 of 67 cases, there may have been more than one tenant in the past; for example, the NFL New York Jets played at Shea Stadium from 1964 to 1983 before they moved to Giants Stadium at the Meadowlands. In these cases, credit is given for these years at the rate of $2 million per tenant per year, adjusted to 2001. It is noted that public ownership does not always imply receipt of revenues from facility operation, because public owners may transfer full operating responsibility to a private entity, and, conversely, privately owned facilities may receive ongoing public subsidies to defray operating costs. Alternately, if the public sector retains ownership of the land under the facility, it may receive annual ground lease payments.

6. There are a number of different industry sources for facility lease data, including other fee-for-data companies such as Kagan, Revenues from Sports Venues, and Front Office Publications. In general, the data offered by these companies were found to be inferior in quality and scope to that offered by other sources. A limited number of academic case studies consider lease arrangements on a single-case or single-city basis. Forsythe (2000) presented the only comparative analysis of lease provisions from the public sector perspective. Specifically, he compared leases for a number of new MLB and NFL stadiums in his capacity as in-house counsel to the City of Pittsburgh during its decision to build and operate two new stadiums. His study compared lease provisions qualitatively among specific line items, such as share of gate, premium seating, maintenance expenses, and capital improvements. He made no quantitative predictions, and his data source was the facility lease database produced by the *Team Marketing Report*.

7. Another possible way to estimate operating costs is to substitute industry averages among all facilities. For example, if the average per-seat cost of an outdoor football stadium is $3.00 per event, then this could be substituted into the cost model. Unfortunately, such industry averages are not available, largely because differences between facilities (capacity, roofing, number of ML tenants, number of possible event days) and locations (climate, labor costs) render averages less meaningful. Baim (1994) and Quirk and Fort (1997) illustrated that in reality, operating costs do vary substantially between facilities. For example, in 1989, total operating expenses for the year were $464,000 at Arrowhead Stadium, $5.3 million at the HHH Metrodome, and $17 million at the Louisiana Superdome. Rod Fort suggested that the use of industry averages would have the effect of substantially smoothing differences between locations—an effect contrary to the overarching objective of understanding differences in public subsidies across cities (Rod Fort, personal communication, March 2001; Fort is coauthor with James Quirk of *Pay Dirt*, 1997, and is assistant professor of economics at the University of Washington).

An alternate approach to maintenance is to estimate costs hedonically, using the 1991 variable cost data presented by Quirk and Fort (1997) and controlling for facility type, capacity, and roofing. Although not perfect, such cost estimation would likely result in less smoothing than the use of industry-wide averages. Because, however, their 1991 data represent a small sample, and because a number of those included have been replaced during the 1990s (thus presenting different operating cost profiles), the results of a hedonic model are not anticipated to accurately reflect the current in-use population. Moreover, this solution adds a layer of complexity to the measurement process that substantially reduces its

transparency. In short, hedonically derived cost data might not produce sufficient improvements in data reliability to warrant the effort.

REFERENCES

Baade, R. A. (1987). *Is there an economic rationale for subsidizing sports stadiums?* Chicago: Heartland Institute.

Baade, R. A. (1996a). Professional sports as catalysts for metropolitan economic development. *Journal of Urban Affairs*, *18*(1), 1-17.

Baade, R. A. (1996b). Stadiums subsidies make little economic sense for cities: A rejoinder. *Journal of Urban Affairs*, *18*(1), 33-37.

Baade, R. A., & Dye, R. E. (1988, August). Sports stadiums and area development: A critical review. *Economic Development Quarterly*, 265-275.

Baade, R. A., & Dye, R. E. (1990, Spring). The impact of stadiums and professional sports on metropolitan area development. *Growth and Change*, 1-14.

Baim, D. (1994). *The sports stadium as a municipal investment*. Westport, CT: Greenwood Press.

Benson, M. (1989). *Ballparks of North America: A comprehensive historical reference to baseball grounds, yards, and stadiums, 1845 to present*. Jefferson, NC: McFarland.

Danielson, M. N. (1997). *Home team: Professional sports and the American metropolis*. Princeton, NJ: Princeton University Press.

Euchner, C. (1993). *Playing the field: Why sports teams move and cities fight to keep them*. Baltimore: Johns Hopkins University Press.

Forsythe, K. C. (2000, Spring). The stadium game Pittsburgh style: Observations on the latest rounds of publicly financed sports stadia in Steeltown, USA; and comparisons with 28 other major league teams. *Marquette Sports Law Review*, *10*(2), 237-310.

Fort, R. D., & Quirk, J. (1995, September). Cross-subsidization, incentives, and outcomes in professional team sports leagues. *Journal of Economic Literature*, *33*, 31-54.

Gershman, M. (1993). *Diamonds: The evolution of the ballpark*. Boston: Houghton Mifflin.

Greenberg, M. J. (2000). *The stadium game*. Milwaukee, WI: National Sports Law Institute, Marquette University.

Keating, R. (1999). *Sports pork: The costly relationship between major league sports and government*. Washington, DC: Cato Institute, Policy Analysis 339.

Lowry, P. J. (1986). *Green cathedrals: The ultimate celebration of all 27 major league, Negro league ballparks, past and present*. Reading, MA: Addison-Wesley.

Noll, R.G., & Zimbalist, A. (1997). *Sports, jobs, and taxes*. Washington, DC: Brookings Institution Press.

Okner, B. A. (1974). Subsidies of stadiums and arenas. In R. Noll (Ed.), *Government and the sports business* (pp. 325-349). Washington, DC: Brookings Institution.

Petersen, D. C. (1996). *Sports, convention, and entertainment facilities*. Washington, DC: The Urban Land Institute.

Quirk, J., & Fort, R. D. (1997). *Pay dirt: The business of professional team sports* (Rev. ed.). Princeton, NJ: Princeton University Press.

Reidenbaugh, L. (1983). *The Sporting News: Take me out to the ballpark*. St. Louis, MO: Sporting News Publishing.

Rich, W. C. (2000). *The Economics and Politics of Sports Facilities*. Westport, CT: Quorum Books.

Rosentraub, M. S. (1997). *Major league losers: The real cost of sports and who's paying for it*. New York: Basic Books, Harper Collins.

Siegfried, J., & Zimbalist, A. (2000, Summer). The economics of sports facilities and their communities. *Journal of Economic Perspectives,* 94-114.

Team Marketing Report. (2001). *Inside the ownership of professional sports teams*. Chicago: Team Marketing Report, Inc.
Zimmerman, D. (1996). *Tax exempt bonds and the economics of professional sports stadiums*. Congressional Research Service Report 96-460E. Washington, DC: Congressional Research Service.

Judith Grant Long is assistant professor of Urban Planning and Policy Development at Rutgers University. Her expertise is in public/private partnerships for real estate development, focusing on sports, tourism, and cultural infrastructure. Her current research surveys global approaches to facility financing and development for the Olympic Games