

The Economics of Sports

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Editor

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Who is Sitting in the Stands? The Income Levels of Sports Fans

John J. Siegfried and Timothy Peterson
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About a decade ago, an unprecedented professional sports stadium and arena construction boom emerged in the United States as professional sports team owners began to recognize their ability to play image-conscious metropolitan areas off against each other. New stadiums and arenas were attractive to these team owners not because their games could not be played in existing facilities—most of the existing stadiums and arenas were less than thirty years old and many were far from sold out—but rather because revenue prospects began to depend on new stadium configurations. Architects of the 1960s and 1970s who built the old-style arenas and stadiums did not anticipate how many wealthy individuals and corporations would be willing to pay for the status, exclusivity, and amenities of club seats and luxury boxes. However, rapid economic growth, rising income inequality, and the increasing popularity of relative status have combined to create an enormous demand for high-end sports services in the 1990s. When team owners report that their stadium is “inadequate,” they mean that it is inadequate to produce the revenues that the team owner would prefer to collect.

Revenue enhancement alone, however, is not necessarily worthwhile to team owners. Prospective incremental revenues must be weighed against the additional costs required to attract them. That is where a taxpayer-financed stadium fits into a team’s income statement. Stadiums that provide exclusive seating in luxury boxes and club seats are expensive to build. Costs are always lower, of course, if the owner can get someone else to foot the construction bill and then pay them a trivial rental rate for use of the facility, as characterizes many recently

constructed sports stadiums and arenas.¹ Furthermore, without the sunk costs of stadium ownership to tie him down, the owner increases his ability to extract further concessions from the local population by periodically threatening to move the team. If the team receives revenues from nonsports uses of the facility throughout the year, a contract provision that is fashionable in modern stadium and arena leases, the owners' revenues can be expanded further.

The vast majority of premier league professional sports stadiums constructed in the 1990s have been financed partly by taxpayers, including federal, state, and local (Noll and Zimbalist 1998, appendix to chapter 1). About 25 state and local governments have provided at least \$100 million each in subsidies to professional sports teams (Rosentraub 1997, pp. 16). Even the few new stadiums that have been privately financed usually have benefited from a substantial public underwriting for access roads and utilities infrastructure.

Federal taxpayers contribute to these stadiums and arenas primarily by means of the federal government forgoing tax revenue on interest paid to holders of tax exempt municipal bonds used to finance construction (Zimmerman 1998). These forgone tax revenues must either be made up elsewhere or public services reduced accordingly. State and local tax support is more direct, often involving direct outlays of property tax receipts, or the earmarking of either sales tax revenues collected on tickets to the events held in the facility or revenues from a lottery. Unless all of the facility's patrons are from outside the local area, at least some, and usually a large proportion of these earmarked tax revenues would have been collected by the state or local tax authority anyway as local consumers purchased other taxable items as part of their established expenditure pattern.

In spite of the often emotional public debate about the equity consequences of public policy, the controversy surrounding stadiums and arenas has focused largely on local economic development prospects and opportunities to enhance a metropolitan area's public image. Unfortunately, the debates usually center on the financing of stadiums and arenas rather than on net *economic* effects. Financial transfers are treated as costs to those who provide the financing and benefits to those who receive it regardless of the expansion or contraction of real economic activity. The focus on financial implications of public subsidies

for sports facilities leaves both the efficiency and equity consequences of such policies largely unexamined.

EVALUATING PUBLIC PROJECTS

In the 1960s economists adopted a taxonomy for evaluating public projects. This taxonomy involved two parts: efficiency and equity effects (Okun 1975). A literature developed to assist in measuring economic benefits and costs and especially in identifying easy to overlook opportunity costs. Methodological contributions focused on properly weighing benefits against costs.

In recent years economists have begun to apply this taxonomy to the public provision of sports facilities. Robert Baade (1987, 1994, 1996) stimulated more careful analysis of the claims of stadium proponents through a series of studies assessing the economic impact of new teams and/or facilities on local economies. Roger Noll and Andrew Zimbalist's (1997) recently published *Sports, Jobs, and Taxes* organizes much of what is now known about the efficiency consequences of publicly provided stadiums and arenas and helps to distinguish real economic effects of such facilities from the financial transfers surrounding them.

EQUITY ISSUES

To date, however, there seems to have been little interest in the equity consequences of public policy relating to sports facilities. Some groups that oppose political referendums on public subsidies for sports stadiums or arenas assert that the poor are buying playgrounds for the rich, but there is little objective evidence available about the income redistribution consequences that arise when communities allocate public funds for the construction of sports facilities for privately owned professional sports teams.²

The distributional consequences of public projects are complicated because many direct burdens and benefits are passed along to taxpayers

or beneficiaries who do not attract attention. The extent to which benefits and/or costs are passed along depends on the magnitude of various elasticities of supply and demand that are extremely difficult to evaluate. For example, a common method of financing new venues is to earmark either sales taxes collected on tickets sold to events in the facility, on restaurants, on rental cars, or on hotel and motel use. Even if one assumes that none of these taxes would have been collected by the taxing authority were those who buy tickets to have purchased alternative items, the ultimate incidence of such ad valorem sales or hotel taxes depends on the elasticities of supply and demand. As thousands of introductory economics students show on problem sets and exams each year, if demand is inelastic and supply is elastic, the consumers bear relatively more of the burden. On the other hand, if demand is elastic, and supply is inelastic, the suppliers bear most of the burden. The challenge, of course, is measuring the relevant elasticities.

WHO PAYS THE SUBSIDY?

A careful accounting of the distributional effects of publicly subsidized stadium or arena projects requires an assessment of the sources of revenue as well as the beneficiaries of the services provided and the recipients of the revenues. Identifying who pays for stadium subsidies is complicated because there are usually multiple revenue sources, and the ultimate incidence of different taxes varies. Local taxes are raised primarily via levies on retail sales, property, and hotel and motel use. Because the marginal propensity to consume is less than one, general sales taxes are usually considered regressive, especially if the tax base includes food and clothing. Property taxes, at least in intermediate ranges, are thought by some economists (Pechman 1985) to be proportional; at the higher ranges they may be progressive (O'Sullivan 1996). The incidence of hotel and motel taxes is difficult to assess because such taxes are paid primarily by myriad businesses that, in competitive markets, would pass them along to their customers. Incidence would ultimately depend on the affluence of those customers. In an analysis that tried to trace such specific taxes through the economy to the indi-

viduals who ultimately pay them, Siegfried, McElroy, and Sweeney (1982) found hotel and motel taxes to be progressive.

State revenues to subsidize sports facilities are raised primarily from general sales taxes, personal and corporate income taxes, lotteries, or a "sin tax" on alcohol. Both federal, and state or local personal income taxes are modestly progressive (Clotfelter and Cook 1989, p. 227). The incidence of corporate income taxes is complex and remains controversial. Lotteries are regressive, although they may be less objectionable because they are a "voluntary tax" (Clotfelter and Cook 1989, p. 223). Siegfried and colleagues found taxes on alcohol to be mildly progressive; Clotfelter and Cook (p. 227) report evidence that taxes on alcohol are regressive.

Finally, the federal government's revenue sources are so diverse that it would be virtually impossible to predict which taxes would be higher because of federal subsidies to sports facilities. Because federally tax exempt municipal bonds are attractive only to those lenders in relatively high marginal income tax brackets, however, we can be sure that some of the benefits accrue to relatively high income individuals. The costs are borne either by those who would have benefited from the alternative public projects that would have been funded in the absence of the tax break for municipal bonds used to finance sports facilities or by those who pay the marginal taxes.

WHO BENEFITS DIRECTLY FROM THE SUBSIDY?

The incidence of taxation is a subject for another day, however. Here we want to learn about the income characteristics of the beneficiaries of publicly provided sports facilities. This is but a simple first step toward assessing the distributional impact of public subsidies for professional sports facilities. To address this question, it is useful first to categorize the primary beneficiaries of subsidies for new sports stadiums or arenas.

The most obvious beneficiaries are claimants on team revenues. New sports stadiums are desired by teams because they enhance team revenues through opportunities to lease luxury boxes, sell club seating tickets at premium prices, increase concession revenues, and expand

advertising revenues, e.g., signs in the stadium and/or stadium “naming rights.” To the extent that new playing facilities increase the demand for tickets, owners of teams in other league cities benefit too through revenue sharing in Major League Baseball (MLB) and in the National Football League (NFL). Net revenues also climb as a team’s facility costs disappear. Players and team owners carve up most of professional sports teams’ revenues. Both groups are comprised of very high income individuals. There is little doubt that to the extent that public subsidies of sports stadiums and arenas allow teams to increase net revenues by expanding revenue opportunities and reducing team costs, the lion’s share of those revenues go to individuals in the top one-tenth of one percent of the national income distribution.

Of the 115 major league men’s professional sports teams operating in 1998, the controlling interest in at least 28 was owned by an individual on the 1998 *Forbes* magazine list of the wealthiest 400 Americans (Gorham, Kafka, and Neelakantan 1998). If the 50 wealthiest family groups and minority interests in sports teams are added to the number of teams owned by “top 400” wealthiest individuals, the count swells to 38.³ Public subsidies to stadiums or arenas constitute a subsidy program for some of the wealthiest people in the country, each of whom has net assets exceeding half a billion dollars.

Players are not nearly as wealthy as owners. The average income of players in the National Basketball Association (NBA), National Hockey League (NHL), NFL, and MLB in 1998 was \$2.6, \$1.2, \$0.8, and \$1.3 million, respectively; minimum salaries in the leagues were \$242,000, \$125,000, \$158,000, and \$170,000, respectively. While not in the stratosphere of the average team owner’s wealth, even those premier league professional athletes earning the “minimum wage” earn numerous standard deviations of income more than typical Americans. Those athletes who are paid the average for their league earn more in a single year than an average American might expect to earn in a lifetime.

Team owners and players receive most of a team’s incremental revenues because they own the ultimate scarce resources. Team owners possess the scarce rights to participate in the premier league in their sport. They limit entry into the league to preserve this scarcity value. Absent scarcity of franchises, there would be little reason for anyone to pay much of anything in excess of the market value of future player

contracts (the relatively small extent to which the value of the players’ services exceeds their contractual salaries) and equipment for an existing franchise when they could simply secure a new one. Since expansion franchises have no player contracts or equipment, they would be free. The actual price of franchises reflects monopoly power and little else. Owners clearly have title to a scarce resource—access to the premier league championship.

Players also possess monopoly rights, since they (and especially “star” players) own the scarce resources necessary to produce professional sporting events. Fans would not be willing to pay to see Tim Peterson and John Siegfried replace Michael Jordan and Scottie Pippen on the NBA champion Chicago Bulls. In fact, fans would not be willing to pay as much to see top NBA “lottery” draft picks replace Jordan and Pippen. Star players control a differentiated product for which there are often no good substitutes in the eyes of the fans—their athletic talent and personalities. Under such circumstances economic theory predicts that at least some portion of net revenues made available by a public subsidy that expands gross revenues and reduces facility costs will be transferred to players.⁴ These net revenues are virtually all economic rent.

In addition to the revenues divided between players and owners, there may be direct benefits that accrue to consumers. Only in that rare case when a consumer is completely indifferent to the choice between purchasing a good or service or not is no consumer’s surplus created. In recent years, sports teams have successfully designed price discrimination schemes to extract some of this consumer’s surplus. However, because few people agonize over the decisions either to buy a ticket or to watch a game on television, there is no question that some surplus remains for almost every purchaser of tickets or viewer of games on television.

The direct demand for professional sporting events is manifested primarily through the demand for tickets to live professional sporting events and the demand for viewing games on television. Although there is no way to determine the magnitude of consumer surplus enjoyed by those who buy tickets or view games on television, we can be sure that most of the fans receive some consumer surplus. It is of more than passing interest to identify these individuals because they are the local consumers who will enjoy increased utility from a subsidy

to a stadium or arena that either prevents a team from moving elsewhere or lures a team into the area.⁵ Because there is little question that the owners and players are relatively affluent, the only prospective direct beneficiaries of public sports facility subsidies who are not wealthy are the fans.

INDIRECT BENEFITS

The objective of this essay is to identify the income distribution position of the direct consumers of sports. In addition to direct private benefits manifested in consumer's surplus, some indirect "public consumption" benefit is likely to be provided by sports stadiums or arenas. Such external benefits may arise from increased self-esteem enjoyed by residents who believe that they are better off living in a "big league city," or who at least believe that their lives are enhanced if others view their community as a "major league place" (Rosentraub 1997, pp. 25–26). The fact that virtually all well-conducted studies of the economic development effects of professional sports teams and/or new stadiums or arenas find no impact whatsoever (an exception being a recent study by Coats and Humphreys [1999], who found a negative effect) does not undermine the possibility of external benefits, although it casts doubt on their magnitude. Trickle-down economic impacts are not the only source of external benefits. So long as the local residents believe that they are better off with an enhanced public image and we respect consumer sovereignty, then they benefit from the team, stadium, or arena whether the basis for their belief is valid or not.

External benefits can also arise from the personal consumption of following a team's fortunes, discussing the team's success around the water cooler, or as a rallying point that brings a community together. Of course external costs may also arise from depression caused by a team that chronically loses, increased traffic congestion on game days, domestic conflict generated by the home team's game being televised during Thanksgiving dinner, or time diverted from work effort as employees congregate around the water cooler more frequently than their supervisor would like.

It is difficult to determine how such external benefits might be distributed across individuals at different points along the income distribution. Before we even worry about their distribution, however, we need to document the existence and magnitude of external benefits. While doing so, we should also catalog any external costs associated with the presence of a professional sports team. Zimmerman (1998, p. 122) suggests that these benefits might be valued equally by all individuals or that fans (particularly those fans who purchase tickets to games) are likely to value them more than others. If such external benefits are distributed in proportion to fan purchases of tickets, then our efforts to understand the income position of those who purchase tickets and view games on television will simultaneously reveal the distribution of the external benefits. On the other hand, the distribution of these external benefits may differ from the distribution of benefits that accrue to buyers of tickets and viewers of televised game broadcasts.

WHO BUYS THE TICKETS TO SPORTING EVENTS?

The individuals who purchase tickets for professional sporting events are the people who enjoy the consumers' surplus from the direct consumption of sporting event services. Thus, it is of interest to learn precisely who are the people who enjoy benefits in excess of the price they pay for tickets to the games. It is these people who secure direct benefits from the presence of a professional sporting team and/or stadium or arena. To the extent that a publicly subsidized stadium or arena attracts a team to a community or prevents an incumbent franchise from moving elsewhere, it is those who buy tickets to the games or who receive more enjoyment from watching games on television that involve their hometown team rather than teams from other cities who are direct beneficiaries of the public subsidy.

Our argument that fans benefit from a publicly subsidized stadium is not a claim that ticket prices are lower because of the public subsidy. Indeed, as a reduction in fixed costs, a rent subsidy imbedded in a 25- or 30-year lease is unlikely to affect ticket prices at all. Rather it is a balancing of marginal costs against marginal revenues that identifies the profit maximizing ticket price level. Our interest in the affluence of

sports ticket purchasers instead hinges on the belief that the very existence of the opportunity to purchase tickets and attend games in one's hometown depends on the public subsidy because of the artificial scarcity of premier league teams created by the monopoly leagues. The public subsidy creates some amount of consumer surplus for the fans who purchase tickets by means of its responsibility for the team's presence. Each fan who purchases tickets must be better off than he or she would have been in the absence of the team, otherwise they would simply continue their previous consumption pattern and decline to purchase tickets.

THE DATA

As part of its Consumer Expenditure Survey (CES), the Bureau of Labor Statistics interviews a continuous rotating panel of households in the U.S. to collect data for calculating the Consumer Price Index. This nationally representative recall survey provides information on expenditure patterns and income levels of slightly more than 5,000 households each quarter.⁶ It is constructed so that each quarter can be treated as an independent sample; thus four quarters of data furnishes a sample of about 20,000 U.S. households.

We use two types of information from the 1994 CES samples: pre-tax family income and itemized expenditures for: "admission fees to sporting events," and "admission fees to sporting events on out-of-town trips." Admission fees include both single-game and season tickets. All of the sporting event tickets documented in the CES were purchased by individuals; we have no information on tickets purchased by businesses or who enjoys the use of those tickets. It is likely that this omission biases downward the reported income levels of those who attend sporting events.

Sporting events are all inclusive. They range from auto and horse racing to professional golf and tennis, or whatever survey respondents consider "sporting events." Minor league baseball as well as college sporting events are included. A large fraction of the money spent on tickets, however, is accounted for by the four major men's professional team sports—baseball, basketball, football, and ice hockey, each of

which is well practiced in the art of negotiating subsidized facilities for their team's games.⁷

Data from the 1972–1973 CES, revealed that the typical purchasers of season tickets to sporting events had median incomes 58 percent above the average (McElroy, Siegfried, and Sweeney 1982). Those purchasers of single-game tickets had median incomes about 10 percent above the overall average. In the early 1970s, sports teams had not yet discovered the lucrative personal seat license (PSL) system of extracting payments in excess of the face value of tickets from more-rapid fans. The price of PSLs makes it unlikely that a stadium crowd in 2000 consists of many people holding minimum wage jobs, aside from the ushers and concession workers serving those in the club seats and luxury boxes. If anything, the disparity between the income level of those attending professional sporting events and the average "Joe Six-pack" has widened over time.

By 1994 the CES no longer separated season tickets from single-game tickets. It did, however, distinguish tickets purchased while at home from those purchased while traveling out-of-town. We combine these two categories of sporting event tickets into a single "sporting event tickets" category.⁸

Our analysis is based on four quarters of data from 1994. Tickets to sporting events were purchased by an average of 5.6 percent of the consumer units each quarter (totaling 1,147 consumer units for the year). Thus, up to (but more likely a lot less than) 22 percent of consumer units might purchase tickets during a full year.

INCOME LEVELS OF SPORTS TICKET PURCHASERS

Table 1 reports measures of central tendency for income levels of consumers who do and do not purchase sporting event tickets. The unweighted mean personal income level of consumers who bought sporting event tickets shows that they enjoy average incomes 59 percent above those who do not purchase sporting event tickets.⁹ The weighted mean weights the income levels of households that bought tickets by their expenditures on tickets and is a more accurate reflection of the personal income levels of those who typically use the tickets.

Table 1 Income Levels of Consumers by Attendance at Sporting Events, 1994^a

Income of	Simple mean	Weighted mean	Median
A. Consumers who purchase tickets to sporting events	\$48,288	\$56,124	\$42,663
B. Consumers who do not purchase tickets to sporting events	\$30,350	\$30,350	\$22,258
C. Ratio of A:B	1.59	1.85	1.92

SOURCE: Consumer Expenditure Survey, 1994 (Bureau of Labor Statistics).

^a Incomes are in nominal 1994 dollars.

Not surprisingly, the weighted mean shows a larger income gap (85 percent) between consumers who do and do not purchase tickets to sporting events. We also report median income levels because mean income levels can be affected by extremely high incomes of a few consumers and by the 1994 CES practice of "topcoding" all incomes exceeding \$300,000 at \$300,000.¹⁰ Using medians, the difference between the two groups is 92 percent.

Depending on the measure of central tendency, sporting event consumers have incomes from 59 to 92 percent above the levels of consumers who do not buy sporting event tickets. When consumers who buy sporting event tickets are mixed with those who do not, the 1994 median income level is \$23,194. Thus, the median income level of consumers of sporting event tickets is 84 percent above the overall median income level. This number is in contrast to the 58 percent differential for season tickets and 10 percent differential for single-game tickets in 1972-1973. Because only a small fraction of the consumer units purchase tickets, the reported averages for those who buy no tickets at all are always close to the overall U.S. average income.

In computing weighted means, those consumers purchasing a disproportionate share of tickets to sporting events have a greater effect on the average income level. The small sample size of 1,147 consumer units that purchased sporting event tickets risks placing undue reliance on the consumption patterns of relatively few consumers. To assess the sensitivity of our results to this possibility, we eliminate households

that individually account for over 5 percent of the total expenditures for sporting event tickets in a quarter. This criterion eliminates seven households (two low-income and five high-income), after which the weighted-mean income of consumers of sporting event tickets drops from \$56,124 to \$55,883. This still exceeds the mean income of consumers who did not purchase any sporting event tickets by 84 percent.

To maintain individual respondent confidentiality, the CES top-coded income at \$300,000 in 1994. Four percent of households that purchased sporting event tickets were topcoded in contrast to 1.6 percent of households that did not purchase sporting event tickets. Topcoding causes a greater downward bias in the income level of consumers of sporting event tickets than in the income levels of consumers who do not buy sporting event tickets. It thus causes our calculations to understate the differences in income levels between sports consumers and others. Topcoding also reveals that sporting event tickets are more than twice as likely to be purchased by consumers with income exceeding \$300,000 as are other goods and services.

The conclusion is clear. Incomes of consumers who purchase sporting event tickets are significantly greater than incomes of consumers who do not buy tickets to sporting events. If we were able to include in the analysis individuals who enjoy access to tickets purchased by small businesses and corporations and those who have leased luxury boxes, the difference surely would be even greater. Ticket prices to minor league contests and college games are substantially lower than ticket prices to premier league professional games. Because our analysis combines all of these types of events, it undoubtedly understates the income gap between those who attend major league professional sporting events and the general public. As more new stadiums with relatively more luxury boxes and club seats are completed, the gap will continue to grow.

INDIRECT EVIDENCE FROM TARGETED ADVERTISING

Consumer Expenditure Survey data do not identify the particular sports events for which tickets are purchased. To explore differences in income levels among the fans of different sports and to assess the rea-

sonableness of our CES-based estimates, we collected information about advertising in event programs, in stadiums and arenas, and on televised broadcasts of games. Advertising in event programs is directed at individuals who attend the events. Advertising on televised broadcasts is directed at people who watch the games on television. Advertising in the facility is directed at both groups, as those who attend the games see signage in the stadium or arena, and those who watch on television may see the signage too.

Advertising in event programs thus provides information that should match the information we collected from the CES. Our analysis of income levels of consumers based on advertising assumes that advertisers direct their messages at people who are most likely to purchase their products. We expect to find that the products purchased frequently by sports fans who buy tickets are advertised in event programs. Products that are likely to be purchased by sports fans who view games on television are likely to be advertised during television commercials. By looking at the income levels of the consumers of these products, we can infer the income levels of those who attend games and those who view them on television.¹¹

To assess the income levels of the consumers of the various goods and services targeted by each advertising type, we first classify the specific product advertised and then identify the median income of all consumers of that product from the CES. If an advertiser sells products in various CES categories, we assign the advertisement to all of those categories and average the median incomes of consumers of products in the various categories to create a representative income level for the target audience of the advertisement. We aggregate the income levels across the various products advertised via a particular medium (e.g., event program or signage or television) for each of the four professional team sports by calculating the median of the median incomes of consumers of the various advertised products. The procedure is illustrated in Table 2, which reports the advertisers in a randomly selected Baltimore Orioles baseball game program and the respective median income levels of the consumers of the products sold by the advertisers.

Our research assignment consisted of reviewing many spectator programs, advertisements on stadium walls and scoreboards, and viewing over 30 televised games. The latter was accomplished by videotap-

Table 2 Baltimore Orioles Program Advertisements with Corresponding Median Income Level of Consumers of the Products or Services Advertised

Products or services advertised	Median income levels of consumers of product or service based on CES (\$)
Bacardi rum	23,480
Rums of Puerto Rico	23,480
Beck's beer	23,480
Gordon's vodka	23,480
Super Pretzel	25,000
Lemon Chill	25,000
Esskay hot-dogs	25,000
Old El Paso (food)	25,000
Sprint (telephone service)	25,781
Coca-Cola	27,979
Milk	27,979
Powerade (sports drink)	27,979
Deer Park (bottled water)	27,979
Rawlings Sporting Goods	28,110
Energizer batteries	29,820
Value City Furniture	31,213
Bravo Card (ATM card)	31,425
Matrix (hair care)	33,801
State Farm Insurance	34,000
NationsBank	34,125
First Union Bank	34,125
First National Bank	34,125
J.C. Penney (department store)	37,000
Montgomery Ward (department store)	37,000
St. Agnes Healthcare	37,850
Sheraton Inner Harbor Hotel	37,895
Motorola (electronics)	41,091
Adventure World (amusement park)	41,161

Table 2 (continued)

Products or services advertised	Median income levels of consumers of product or service based on CES (\$)
Sharp computers/electronics	41,610
Starter sportswear	41,610
Diamond sportswear	41,610
Southwest Airlines	42,000
MasterCard	44,813
Saturn	48,704
Trane air conditioning	49,313
Office Depot	50,175
Tuxedo House (tuxedo rental)	52,215
Cellular One	67,018
Median of the median incomes of consumers of products advertised	37,063

ing the games and reviewing the tapes.¹² The peculiar twist to our research is that we fast-forwarded through the games and watched the advertisements at normal speed!

There are some inherent weaknesses in this approach. First, products often are differentiated to appeal to people of different means. The CES does not distinguish product categories in terms of the income of the target audiences, however. There is no separation of "restaurants for high-income people" from "restaurants for low-income people." Premium brands of imported beer are lumped in with local generic beers. Because we group together differentiated products targeted at low- and high-income consumers, our advertising-based method of estimating consumer income levels should reveal less divergence between the income levels of sports consumers and the income levels of nonsports consumers than actually exists.

A second problem is securing sufficient data. In several cases, our sample sizes are sufficiently small that the evidence is anecdotal rather than systematic. We are missing signage information for basketball and television broadcasting information for football. We report medians to

Table 3 Consumer Income Levels by Sports Advertising Targets^a

Sport	Event programs			Facility signs			Television advertising		
	Income (\$)	N	Ratio ^b	Income (\$)	N	Ratio ^b	Income (\$)	N	Ratio ^b
Baseball	31,898	10	1.43	33,391	9	1.50	36,277	20	1.63
Basketball	39,075	2	1.76	n/a ^c	n/a	n/a	40,711	8	1.83
Football	38,189	6	1.72	29,682	3	1.33	n/a	n/a	n/a
Ice hockey	40,255	2	1.81	37,642	6	1.69	37,065	4	1.66
Mean of medians across all sports	37,326			33,572			38,016		
Median income of households that do not purchase tickets to sporting events	22,258			22,258			22,258		

SOURCE: Authors' survey and Consumer Expenditure Survey, 1994 (Bureau of Labor Statistics).

^a Incomes are in nominal 1994 dollars.

^b Ratio is the ratio of the respective income levels to the income levels of consumer units that do not purchase tickets to sporting events.

^c n/a indicates that no data were collected.

avoid distortions caused by topcoding incomes. Although the advertisements were run in 1997, the median income levels we assign to the products are from the 1994 CES. Thus the income data are in 1994 nominal dollars. All of the estimates based on the targets of advertising are reported in Table 3.

EVENT PROGRAMS

We assembled randomly selected game programs from 10 major league baseball teams, seven professional football teams, two professional basketball franchises, and two professional ice hockey teams. The median of the median income levels of consumers of the various products advertised in baseball programs ranged from \$27,980 at Philadelphia Phillies games to \$38,500 for those of the Chicago White Sox games. The mean over 10 sampled baseball teams was \$31,898.

The corresponding median income level targeted for fans of the seven football teams ranged from \$35,000 for Seattle Seahawks fans to \$40,225 for those of the Chicago Bears. In basketball, the Indiana Pacers had a targeted median income level of \$37,895; the Minnesota Timberwolves, \$40,255. Both ice hockey teams in the sample (the Detroit Red Wings and the Tampa Bay Lightning) had identical median incomes of consumers of products advertised in their program of \$40,255.

The ratio of the estimated income levels of consumers of products advertised in game programs to the income levels of consumers who do not purchase tickets to sporting events (from the CES) is also reported in Table 3. It ranges from 1.43 for baseball to 1.81 for ice hockey. The ratios for basketball, football, and ice hockey, ranging from 1.72 to 1.81, are relatively close to the comparable ratio of 1.92 based on the CES data on sports event ticket purchases. This is especially so in light of our expectation that the advertising-based estimates would understate the gap in income levels between sports ticket purchasers and others.¹³ The ratio for baseball is noticeably lower than for the other three sports. Perhaps this is because the lowest-priced tickets for baseball games are substantially below the lowest-priced tickets for the other three sports thereby attracting a different clientele to games.

STADIUM OR ARENA SIGNS

Stadium signs are directed both at people who attend the live events and at the television audience. A similar procedure was used to compute median incomes for the targeted consumers of stadium or arena advertisements for each team in our sample. These incomes were then averaged over the teams and are reported in Table 3.

The median income of the consumers targeted by signage ranges from \$28,010 at Los Angeles Dodgers games to \$38,500 at Florida Marlins games. For the eight baseball teams common to the sample, the simple correlation between the estimated income levels of advertising targets of event programs and those using stadium signage is +0.36. The medians for the three football teams range from \$26,808 for the Buffalo Bills to \$34,126 for the Oakland Raiders; and for the six ice hockey teams from \$35,000 for the Detroit Red Wings to \$39,000 for the Colorado Avalanche.

In contrast to event programs, which are targeted only at people who attend games, football stadium and ice hockey arena signs appear to target lower-income consumers who may be viewing televised broadcasts. The income levels of those targeted for baseball signage, however, do not differ much from those targeted by baseball event program advertising. This inconsistency may reflect the inaccessibility of football and ice hockey event tickets to lower income consumers who, therefore, substitute television viewing for live attendance. However, the income levels of fans who attend baseball games and those who watch them on television diverge less, perhaps because baseball consumers generally have access to lower-priced bleacher seats.

TELEVISION ADVERTISEMENTS

Because television commercials are directed at those who are not attending the events in person, we might expect to observe a continuation of the income-level trends that became apparent as we moved from event programs to facility signage. To assess these income levels, we recorded all of the advertisements on 32 nationally broadcast

games. The sample includes 20 baseball games, eight basketball games, and four ice hockey games. Because the teams varied and the games were broadcast nationally, we do not distinguish income levels by teams.

Only ice hockey advertising follows the expected trend of targeting lower-income fans for products advertised on televised games than for products advertised in event programs, and then only modestly so.¹⁴ We find little difference between the median income of the consumers targeted in televised basketball advertising and that of consumers targeted in basketball game programs. In baseball, the median income of targeted consumers of products touted on televised broadcasts actually exceeds the median income of consumers targeted in game programs. If anything is to be learned from the differences, it is that fans of football and ice hockey are split by income level, with the more affluent viewing games in person. For baseball, the opposite appears to be true; and for basketball, there is no discernible difference in income levels of fans sitting in the arena and those sitting on the couch watching television. The median income level of consumer units targeted on all sports television broadcasts is similar, ranging from 63 percent to 83 percent above the income levels of consumers who do not purchase tickets to sporting events. Thus it appears that television viewers of sporting events have incomes modestly below those fans who attend the games but are still relatively affluent.

Patterns of household access to televised sporting events undoubtedly contribute to the affluence level of television viewers. The percentage of individuals who watch some television does not vary much by household income level (ranging from 91 percent for households with income levels less than \$10,000 annually to 92 percent for households with income levels between \$20,000 and \$30,000 to 89 percent for households with income levels exceeding \$50,000 in 1996). However, the percentage of individuals who view cable television does vary substantially by household income level, from 42 percent for households with income levels less than \$10,000 annually to 58 percent for households with income levels between \$20,000 and \$30,000, to 74 percent for households with income levels exceeding \$50,000 in 1996 (*Statistical Abstract of the United States* 1996, p. 561). A considerable proportion of televised sporting events is distributed exclusively on cable television, including, but not limited to, ESPN and ESPN2.

CONCLUSION

Consumers of sporting event tickets enjoy incomes substantially above the average. Although consumers who watch games on television appear to have lower incomes, they too are affluent in comparison with the nation's overall average income.

A careful documentation of the redistributive effects of public subsidies for sports facilities requires an accounting of the distribution of the subsidies to the teams (which are generally divided between players and owners, almost all individuals in both groups being very affluent), an assessment of the incidence of indirect benefits such as community image enhancement or the enjoyment of "following the local team," and an evaluation of the incidence of the funding mechanisms (taxes and lotteries) used to raise the revenue. One portion of the redistribution—the consumers' surplus flowing to fans—seems to favor relatively more affluent individuals. The remaining aspects of the redistribution are easier to assess intuitively and support speculation that the public funding of sports facilities redistributes wealth from individuals with lower and middle incomes to those with much higher incomes. Whether this redistribution is desirable or not, depends on one's views about its fairness and about the assessment of other economic effects of publicly funded stadiums and arenas.

Notes

Siegfried is Professor of Economics at Vanderbilt University. Peterson earned Honors in Economics and graduated with a B.A. from Vanderbilt University in 1998. T. Aldrich-Finegan, Malcolm Getz, Allen Sanderson, and Andrew Zimbalist provided helpful comments on an earlier draft.

1. The desired size and amenities of a stadium are also affected by its financing. As the team's share of incremental construction cost declines, it will elect a larger and better outfitted facility.
2. A notable exception is Zimmerman's (1998) analysis of the distributional consequences of the federal tax exemption for municipal bonds.
3. This count does not include indirect team ownership such as Rupert Murdoch's News Corporation's ownership of the Los Angeles Dodgers.
4. In several of the sports leagues (e.g., NFL, NBA) players share added revenues with owners on the basis of formulas instituted in conjunction with payroll ceilings that were negotiated between owners and the players' union.

5. The relevant net gain to sports ticket buyers is the difference between the consumers' surplus they enjoy from the opportunity to purchase tickets and what they would have received from buying the goods and services that would have been purchased by them were the sporting event tickets not available.
6. About one-fifth of the sample is replaced by new households each quarter so that after five quarters the entire sample has turned over.
7. Ticket revenues for the four premier league men's professional team sports in the U.S. were \$2.0 billion in 1996 (*Financial World* 1996).
8. The out-of-town tickets comprise 28 percent of combined total expenditures on sporting event tickets and would include tickets purchased to playoff tournaments and college football bowl games.
9. The difference in means is statistically significant at the 99 percent confidence level.
10. The topcoding threshold is now at \$1 million annual income.
11. This approach was originally suggested to us by Allen Sanderson of the University of Chicago.
12. There are no football games in the sample because the data were collected during the spring and early summer of 1997.
13. Corporate marketing guides we obtained from the Baltimore Orioles (baseball) and Chicago Bears (football) reported income distributions of spectators that imply 1994 median incomes of \$53,587 and \$43,436, vis-a-vis the income estimates of \$34,063 and \$40,225, respectively, derived from the targets of game program advertising. Thus, both teams are touting higher incomes for their customers than any of our estimates.
14. Among the four different sports, ice hockey ticket prices are the highest.

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