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HIGH OCTANE? GRADING THE ECONOMIC IMPACT OF THE DAYTONA 500

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INTRODUCTION

Economic impact studies relating to professional sports have proliferated in recent times. Those familiar with the sports industry understand that the avalanche of impact studies is not without purpose. Many of these reports have been commissioned to rationalize the use of public funds for building sports infrastructure. A recent study noted that by 2005 virtually all major league professional baseball, basketball, football and hockey teams will play in stadiums or arenas built after 1990 at a cost to the public of more than \$14 billion.¹ Taxpayers have to be convinced that the investment in professional sports is prudent. Other sports interests have emulated the behavior of the major professional sports, and the opening of the public purse for major professional sports has triggered a deluge of requests for funds for commercial sports for everything from local golf tournaments to horse racing tracks. All the supplicants sound the common theme that public subsidies for professional sports should not be thought of as an expenditure but rather as an investment that will return a multiple of every dollar spent by the host community.

In many ways sports subsidies represent a classic contemporary public finance issue. Scholars have raised questions regarding the efficiency and equity of such investments, and considerable attention has been devoted to the billions in infrastructure investments in major league baseball, basketball, football, and hockey. Despite this attention, to a substantial extent scholars have neglected public investments in that sport which by some measures has the greatest popular following, auto racing. The purpose of this report is to partially fill that void through offering an assessment of the economic impact of the Daytona 500, one

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1. See John Siegfried & Andrew Zimbalist, *The Economics of Sports Facilities and Their Communities*, 14 J. OF ECON. PERSP. (forthcoming Spring 2000).

of the premier auto races in the United States, on the local and regional economies in Florida.

AUTO RACING STATISTICS AND REVIEW OF THE LITERATURE

If attendance at all auto racing venues in the United States was compiled, it may well exceed the number of spectators for any other professional sport in the United States. To corroborate this assertion consider the statistics for attendance in the four major professional sports and the major auto racing events that include NASCAR recorded in Table 1 below.

TABLE 1
ATTENDANCE STATISTICS FOR SELECTED PROFESSIONAL
SPORTS IN THE U.S. IN 1997-98

STATISTIC	MAJOR LEAGUE BASEBALL (MLB) ²	NATIONAL BASKETBALL ASSOCIATION (NBA) ³	NATIONAL FOOTBALL LEAGUE (NFL) ⁴	NATIONAL HOCKEY LEAGUE (NHL) ⁵	MAJOR AUTO RACING SERIES ⁶
Total Attendance (Millions)	70.59	20.37	15.36	17.25	17.08
Number of Events	2,403	1,189	240	1,066	235
Average Attendance	29,376	17,135	64,020	16,182	70,825

The information recorded in Table 1 indicates that on average auto racing crowds are larger than those for sports that most would identify as the most popular in the United States. In fact, if one considers the NASCAR Winston Cup Series, attendance at the Series' 33 events in 1998 averaged 190,940 or nearly three times that of an average NFL game.

2. See 1998 Major League Baseball Weekly Attendance Report, A.P., Jan. 13, 2000 <<http://www.sportserver.com/newsroom/sports/bbo/1998/mlb/mlb/stat/weeklyattend.html>>.

3. National Basketball Association, *NBA Attendance Chart* (visited Jan. 15, 2000) <http://www.nba.com/history/attendance_list.html>.

4. National Football League, *Chronology 1990-1999, 1999 Record & Fact Book: The Definitive Source for NFL Information* (visited Jan. 15, 2000) <<http://nfl.com/randf/chron98.html>>.

5. See Michael K. Ozanian, *Sports Team Valuations*, FORBES, Dec. 14, 1998 <<http://www.forbes.com/tool/toolbox/sports/asp/Teamvaluations.asp>>.

6. This figure includes the National Association for Stock Car Auto Racing (NASCAR). See Goodyear Racing, *1998 Goodyear Racing Attendance Report* (visited Jan. 15, 2000) <<http://www.goodyear.com/us/racing/98attend.html>>.

The economic impact of any sporting event depends on its ability to stimulate new spending in the community, and, all else equal, the greater the number of spectators attracted from outside the area, the greater the increase in net new spending an event will generate. Boosters for the auto racing industry contend that a "major league" auto raceway can induce hundreds of millions of dollars in economic impact. For example, a recent study concluded that Raceway Associates Motorsports Park will bring \$320 million in economic activity to the City of Joliet and Will County in Illinois during the construction phase of the project and the first year-and-a-half of its operation.⁷ The same study estimated that the operation of the track will contribute more than \$100 million annually to the Joliet economy. The estimated economic impact for this track critically depends on its ability to attract 110,000 single-day trip visitors who spend an average of \$25.00 per day, and 100,000 overnight visitors who would spend \$95.16 per day for the two days on average the study claims they would stay.⁸ The economic impact estimate for the speedway in Joliet is consistent with estimates for similar size facilities. The estimated economic impact of the Homestead-Miami Speedway (60,000 seats) and the California Speedway (80,000 seats) is \$100 and \$125 million, respectively.⁹

The fact that Raceway Associates Motorsports Park has only 75,000 fixed seats qualifies it as a modestly sized facility compared to others in the United States. The Indianapolis Motor Speedway is the world's largest facility with more than 250,000 permanent seats, but there are other auto race tracks throughout the United States that have twice the permanent seating capacity of the Speedway in Joliet.¹⁰ For example Daytona has a total of 160,000 grandstand seats and the Texas Motor Speedway features seating for more than 150,000 fans including seating for 13,192 in 194 skyboxes.¹¹ In addition, infield parking at most raceways can accommodate thousands more race day fans.

Tracks have proliferated in recent years, and there are plans to build more. There are now thirty-seven facilities which host NASCAR's top

7. See Raceway Associates, *New Motorsports Facility to Bring Jobs, Economic Development, Increased Tax Revenue to Illinois* (visited Jan. 15, 2000) <<http://www.racewayassociates.com/economicimpact.shtml>>.

8. See *Id.*

9. See ESPN Network, *California Speedway* (visited Dec. 22, 1999) <<http://www.nascar.com/tracks/california/index.html>>; ESPN Network, *Homestead-Miami Speedway* (visited Dec. 9, 1999) <<http://www.nascar.com/tracks/metrodade/index.html>>.

10. See ESPN Network, *Texas Motor Speedway* (visited Dec. 22, 1999) <<http://www.nascar.com/tracks/texas/index.html>>.

11. See *Id.*

three circuits - the NASCAR Winston Cup Series, NASCAR Busch Series Grand National Division, and NASCAR Craftsman Truck Series. At least five of these tracks have been newly completed since 1995, and virtually all of the older tracks have undergone expansion and renovation since that time. Large new facilities are under construction in the Kansas City, Chicago, and Memphis metropolitan areas.

In order to attract people from outside the area, the speedways being constructed require state of the art amenities. The addition of executive suites and luxury condominiums at tracks such as the Texas Motor Speedway and the Atlanta Motor Speedway has raised the amenities bar, and as communities across the country begin to subsidize the construction of these facilities in the hope of stimulating their economies, pressure will be exerted on other speedway communities to provide comparable facilities at significant public expense. A pattern is being established that parallels developments in other professional sports infrastructure in the United States.¹² The efficacy of such investments depends on the ability of speedways to generate the economic activity promised by boosters. We propose to help public officials assess the merits of investing in speedways through examining the economic impact of the Daytona International Speedway.

We have chosen to analyze Daytona for several reasons. First, Daytona publicists assert that their speedway is the home of "The World's Greatest Race" — the Daytona 500 which according to Daytona boosters attracts an estimated 250,000 fans, the largest audience in motorsports. Furthermore, Daytona representatives boast that their 480-acre motorsports complex hosts the most diverse schedule of racing on the globe making it in their words, "the World Center of Racing."¹³ Daytona, therefore, can provide a benchmark against which other estimates on the economic impact of motor speedways can be measured.

Second, there is monthly data available for several years on taxable sales for all counties in Florida. This data can be used to analyze the economic performance of the county in which Daytona is located relative to contiguous counties in Florida that are bounded on the East

12. In February 1999, the Charlotte Motor Speedway changed its name to Lowe's Motor Speedway making it the first major track to sell corporate naming rights. Steve Clark, *The Greed Bug Bites Another Famous Name*, RICHMOND TIMES-DISPATCH, Feb. 11, 1999, at B1. Of course, the sale of naming rights for NBA/NHL arenas and MLB/NFL stadiums has become almost universal.

13. See Daytona International Speedway, *Daytona: Truly the "World Center of Racing"* (visited Dec. 8, 1999) <<http://www.daytona500.com/dishist.shtml>> [hereinafter Daytona International Speedway].

by the Atlantic Ocean. Once the effects of tourism, national and regional economic influences, and other factors that explain county economic development in Florida are accounted for, then the impact of the Daytona 500 on the county can be estimated. This estimate in turn can be used to filter the claims by proponents of subsidies for auto racing facilities. Before providing these estimates, there are important theoretical issues that must be considered, and they are the subject of the next section of the paper.

Third, the location of the Daytona 500, Volusia County, is a relatively small county, and the impact of a major sporting event is more likely to have a statistically significant impact than an event that takes place in a large metropolitan area such as Indianapolis where the Indianapolis 500 is run.

THEORETICAL ISSUES

There are standard techniques for estimating economic impact that have evolved over time, but in general represent an application of standard macroeconomic theory. Technically speaking, an expenditure or incomes approach could be used to estimate the economic impact. The expenditure approach requires as a first step estimates of direct expenditures attributable to the event or project. These first-round, or direct expenditure, changes are then used to estimate indirect expenditures through the use of a "multiplier." Briefly, multipliers are thought to exist because one person's spending becomes income for others who in turn spend a portion of that new income creating income for still others, and so on. The indirect spending converges to some amount because only a fraction of any income increment received as a consequence of someone's spending is spent again. In other words, some of the money leaks from this system through savings, taxation, or money spent outside the host economy (imports). Using this technique, if a mistake is made in estimating direct expenditures, those errors are compounded in estimating indirect expenditures. The secret to generating credible economic impact estimates using the expenditure approach is to estimate precisely direct expenditures.

A precise measure of changes in direct expenditures is fraught with difficulties. Most prominent among them relates to accurately assessing the extent to which spending in conjunction with the event or project would have occurred in the absence of the event. For example, if an estimate was sought on the impact of professional sport on a local economy, consideration would have to be given to the fact that spending on sports may well merely substitute for spending that would occur on

something else in the absence of professional sport. Therefore, if the fans are primarily indigenous to the community, sport may not provide much impact because its availability in a community may serve primarily to reallocate leisure spending while leaving spending overall fundamentally intact. This distinction between gross and net spending has been cited by economists as a chief reason why professional sports does not seem to contribute as much to metropolitan economies as boosters claim.¹⁴ One of the attributes of an event that has national appeal is that gross and net spending changes induced by the event are more likely to converge. This is so because spending at a nationally significant event is more likely to be categorized as export spending since most of it is undertaken arguably by people from outside the community. Skilled researchers will often eliminate the spending undertaken by local residents at a significant event because it is likely to be inconsequential relative to that consumption which is undertaken by those foreign to the host community.

Eliminating the spending by residents of the community would at first blush appear to eliminate a potentially significant source of bias in estimating direct expenditures. Surveys on expenditures by those attending the event, complete with a question on place of residence, would appear to be a straightforward way of estimating direct expenditures in a manner that is statistically acceptable. However, while surveys may well provide insight on spending behavior for those patronizing the event, such a technique offers no data on changes in spending by residents not attending the event. It is conceivable that some residents may dramatically change their spending during an event's play given their desire to avoid the congestion at least in the venue(s) environs. In general, a fundamental shortcoming of economic impact studies is not with information on spending for those who are included in a direct expenditure survey, but rather with the lack of information on the spending behavior for those who are not.

Auto racing requires significant space and generates significant noise. As a consequence, many of the speedways are located a substantial distance from population centers where land is relatively cheap and distance mutes the noise. These realities temper the economic impact a speedway induces in that they are not geographically positioned to maximize interaction with a community's economy. Of course, the isolation of speedways minimizes the extent to which residents alter their behav-

14. See Robert A. Baade, *Professional Sports as a Catalyst for Metropolitan Economic Development*, 18 J. URB. AFFAIRS 12, 12-17 (1996).

ior to avoid the congestion and chaos characteristic of highly attended race events.

A second potentially significant source of bias in economic impact studies relates to leakages from the circular flow of spending. For example, if the host economy is at or very near full employment, it may be that the labor essential to conducting the event resides in other communities where there is a labor surplus or unemployment.¹⁵ To the extent that this is true, then the indirect spending that constitutes the "multiplier effect" must be adjusted to reflect this leakage of income and subsequent spending.

Labor is not the only factor of production that may repatriate income. If hotels experience higher than normal occupancy rates during a mega-event, then the question must be raised about the fraction of increased earnings that remain in the community if the hotel is a nationally owned chain.¹⁶ In short, to assess the impact of large sporting events, balance of payments theory should be utilized. That is to say, to what extent does the event give rise to dollar inflows and outflows that would not occur in its absence. Since the input-output models used in the most sophisticated *ex ante* analyses are based on fixed relationships between inputs and outputs, such models do not account for the subtleties of full employment and capital ownership noted here. As a consequence, it is not clear if economic impact estimates based on them are biased up or down.

The potential shortcomings for calculating the multiplier values described above applies to the uncustomized versions of the most recent United States Department of Commerce's Regional Input-Output System (RIMS II) which is a popular tool used by forecasters. Even when the models used to forecast are customized, the possibility remains that essential pieces of information are ignored and the forecast may miss the mark as a consequence. The models constructed by Regional Economic Models, Inc. (REMI) to their credit specify an endogenous labor sector which gives more accurate readings on the employment and wage impli-

15. The stadium construction accident at Miller Park in Milwaukee on July 14, 1999 illustrates this point. A crane collapsed killing three ironworkers and seriously injuring the crane operator. Of these four people, only two of them resided in the Milwaukee. The third steelworker was from Kimberly, Wisconsin, and the crane operator was from Houston, Texas. See *Tragedy comes into focus at Brewers' field*, GRAND RAPIDS PRESS, July 17, 1999, at C4.

16. It is not altogether clear whether occupancy rates increase during mega-events. It may be that the most popular convention cities, those most likely to host the Olympic Games, would experience high occupancy even if they are not successful in hosting them. Evidence, however, suggests that room rates increase substantially during the Olympics and the Super Bowl, but questions regarding the final destination of those additional earnings remain.

cations of an "event," but the accuracy of the REMI projection depends on the quality of the model that predicts the future of the regional economy in the absence of an event (control forecast) and the economy's future if the event occurs (alternative forecast). The event's impact is estimated as the difference between the control and alternative forecasts. An *ex post* analysis differs from the REMI approach in that it looks at the economic landscape of a locality or a region before and after an event, and attributes the difference in important economic indicators to the event. The key to the success of this approach is to isolate the event from other changes that may be occurring simultaneously and that may exert a significant impact on the local economy.

As an alternative to estimating the change in expenditures and associated changes in economic activity, those who provide goods and services directly in accommodating the event could be asked how their activity has been altered by the event. In summarizing the efficacy of this technique Larry Davidson opined:

The biggest problem with this producer approach is that these business managers must be able to estimate how much "extra" spending was caused by the sport event. This requires that each proprietor have a model of what would have happened during that time period had the sport event not taken place. This is an extreme requirement which severely limits this technique.¹⁷

An expenditure approach to projecting the economic impact of major auto racing events such as Daytona is not likely to yield the most accurate estimates.

THE MODEL

Estimating the economic impact of an event such as the Daytona 500 requires isolating it from other factors that do influence the community's economy. For example, the Daytona 500 takes place in February at the height of the tourist season, and factors that influence tourism will affect the Volusia economy separate from the race. Since Volusia County is bordered on the East by the Atlantic Ocean, some of the crowd that travels to Daytona to view the race would do so even if the race did not occur. The impact estimate would be exaggerated if we attributed all the additional economic activity in February to the 500. One way to identify the incremental economic impact attributable to the race is to compare

17. Larry Davidson, *Choice of a Proper Methodology to Measure Quantitative and Qualitative Effects of the Impact of Sport*, in *THE ECONOMIC IMPACT OF SPORTS EVENTS* 1, 9 (Claude Jeanrenaud ed. 1999).

the conduct of the Volusia economy relative to other Florida counties that are comparable coastal tourist destinations.

In addition, the Florida economy exhibits distinctive cyclical economic behavior. A model that purports to isolate the effect of the Daytona 500 should account for Florida's unique pattern of economic growth. Thus in estimating the effect of the Daytona 500, fluctuations in the economy statewide from February to February have to be incorporated into the model.¹⁸ Statewide changes in population, real disposable income, and inflation all have to be accounted for in explaining Daytona's economic growth from February to February.

In order to isolate the effects of statewide or national economic conditions from the economic effects of the Daytona 500, we calculate the ratio of taxable sales in Volusia County to the total taxable sales in the state. Factors such as population growth, inflation, and the business cycle are likely to effect Volusia County in a similar manner to the rest of the state leaving the ratio unchanged. A local event such as the Daytona 500 will increase the taxable sales in Volusia County relative to the rest of the state, increasing the ratio. By comparing the county to state ratio in February compared to the rest of the year, an increase in taxable sales can be inferred.

As noted above, tourism has a significant impact on the economy of Volusia County. Therefore, we have also repeated the process by calculating the ratio of taxable sales in Volusia County to the taxable sales in a handful of selected coastal resort counties in Florida.

Since the data is compiled monthly by county, it is not possible to separate the impact of the 500 from other events that occurred at the Daytona International Speedway during the month of February. For example during February 2000, there are eight other racing events scheduled at the Daytona International Speedway in addition to the 500 including four other NASCAR races.¹⁹ Our estimate on the economic impact of the Daytona 500, therefore, is properly construed as the impact of events hosted by the Speedway during the month of February.

It should be noted that if major auto races took place at Daytona year-round, then this method could not be used to estimate the effects of the Daytona 500 since Volusia County would exhibit high taxable sales in every month. However, taxable sales in Volusia County during the

18. It should be noted that the taxable sales data reported for Florida is lagged one month. The Daytona 500 in 1999 occurred on February 14, and the relevant statistic would be March to March reported taxable sales.

19. See Daytona International Speedway, *supra* note 13.

rest of the year are not likely significantly impacted by the Speedway since only one other major racing event, the Pepsi 400 in July, takes place at Daytona. Excluding the month of July from our calculations does little to affect our results.

RESULTS

Between June, 1996 and August, 1999 taxable sales in Volusia County averaged 2.04% of total Florida taxable sales in the months excluding February and roughly 2.41% of total statewide taxable sales in February. If the entire 0.37% increase in the percentage of taxable sales is attributable to events at the Daytona International Speedway, the Speedway is responsible for a roughly \$65 million increase in taxable sales on average. Similarly, Volusia County averaged 6.68% of total taxable sales for coastal resort counties in the months excluding February and 7.35% of taxable sales in February. This 0.67% increase translates into roughly an average \$40 million increase in taxable sales as a result of the Daytona 500.

To help demonstrate how not accounting for statewide and coastal factors can distort the economic impact of the Daytona International Speedway on Daytona, results in Table 2 are reported on the increase in taxable sales in total, increases in taxable sales not attributable to statewide variations, and not attributable to coastal county variations.

TABLE 2
INCREASE IN TAXABLE SALES FOR VOLUSIA COUNTY²⁰

Statistic/Year	1997	1998	1999
Increase in Taxable Sales – Total	\$89,108,976	\$79,553,077	\$104,464,095
Increase Not Attributable to Statewide Variations	\$63,634,070	\$56,919,918	\$72,124,460
Increase Not Attributable to Coastal County Variations	\$44,434,920	\$31,716,558	\$49,147,718

The information recorded in Table 2 suggests at least two noteworthy things. First, if one is not careful to consider the impact of nationwide, statewide or regional influences on economic activity, the impact of a sports facility or an event may well be exaggerated. Simply stated

20. The counties that were used to calculate this statistic included: Brevard, Broward, Charlotte, Flagler, Indian River, Lee, Manatee, Martin, Palm Beach, St. John's, St. Lucie, Sarasota, and Volusia.

increases in economic activity are attributed to the facility or event that were in reality induced by other factors. In the case of the Daytona International Speedway, a simple comparison of taxable statistics would indicate an impact more than two times what a more refined but still crude calculation would suggest.

Second, the Daytona International Speedway is not likely to contribute more than \$50 million to the local economy during the month of February. The statistics in row three should be viewed as upper bound estimates since they do not account for the leakages that were discussed above. Furthermore, if indirect expenditures are estimated through applying a multiplier to direct expenditures, then failure to account for leakages in calculating direct expenditures simply compounds the economic impact estimate errors.

Increases in taxable sales do not equate with economic impact for several reasons. First, with regard to products sold at the event from souvenirs to beer, the key is to identify the extent to which the local economy contributes to value added. The smaller and less diverse the host community economy is, the less the fraction of a product's value is locally created. While Daytona Beach is technically considered a metropolitan area, the population is spread out throughout the county so that only 65,000 of the county's 423,000 residents actually live within the city of Daytona Beach, the largest city in the county. Based on the small size of the county and particularly the cities within the county, it is reasonable to conclude that the county does not, in fact, have a particularly diverse economy.

Second, consolidation on the supply side of the racing industry very likely diminishes the local economic impact of racing events. Every major sports event conveys an impression of significant economic activity. The crowds are large and the commercial activity is heated. Impressions can be misleading. While money is unquestionably flowing into the community, the key is how much of the money spent remains within the area to be spent again. It is not inaccurate to describe racing facilities as centers where spectators foreign to the community spend money that is appropriated by those on the supply side of auto racing who are also non-residents. Gate and other venue receipts contribute to the purse which is distributed to a significant degree among the drivers and track owners who are very likely non-residents of the specific neighborhood, city, and county in which the racetrack is located.

To corroborate the national rather than local character of the supply side of the racing industry, consider the fact that many of the tracks are increasingly owned by large corporations. Three major corporations,

Speedway Motorsports, Inc., International Speedway Racing (ISC), and Dover Downs Entertainment, own twenty one of the thirty seven tracks used for NASCAR's top three circuits including seventeen of the twenty-one major tracks used for Winston Cup events.

Speedway Motorsports Inc., which is traded on the New York Stock Exchange (symbol: TRK), owns the Atlanta Motor Speedway (Hampton, GA), Bristol Motor Speedway (Bristol, TN), Lowe's Speedway (Harrisburg, NC), Las Vegas Motor Speedway (Las Vegas, NV), Sears Point Raceway (Sonoma, CA), and the Texas Motor Speedway (Fort Worth, TX).²¹

A recent trend towards consolidation in the auto racing industry is evident. The Daytona International Speedway, the subject of this study, is one of several significant raceways owned by ISC which trades on the NASDAQ (symbol: ISCA). In 1995, ISC completed the Homestead-Miami Speedway and purchased the Phoenix International Raceway two years later. In 1999, ISC purchased Penske Motorsports, Inc. (PMI), the owner of four other large racetracks.

A review of selected consolidated financial data provided by PMI provides further evidence of consolidation prior to its acquisition by ISC. In 1993, PMI reported total attendance of 414,937 at the racing events it hosted at its single facility, the Michigan Speedway. By 1997 attendance at PMI hosted events increased more than 250% to 1,083,206.²² That significant increase is attributable in large part to PMI's acquisition of the Nazareth Speedway (near Allentown, Pennsylvania) and the North Carolina Speedway and its construction of the California Speedway. During the 1993-97 period, PMI's total assets increased from \$36.41 million to \$291.77 million, while stockholder equity increased from \$13.47 million to \$190.69 million.²³

National owned and internationally traded corporations are likely to repatriate a sizable portion of receipts to the corporate headquarters. Repatriated profits and winnings leak from the host community's economy and contribute to a divergence between taxable sales and economic impact. A portion of taxable sales generates income for labor and other resources that service the event and a portion of these resources may not be local. Wages are earned by a variety of guest

21. See Speedway Motorsports, Inc., Company Overview: *About Speedway Motorsports Inc.* (visited Feb. 7, 2000) <http://www.speedwaymotorsports.com/index_b.htm>.

22. Penske Motorsports, Inc., *Selected Consolidated Financial Data* (1998). Total PMI events more than doubled from eight to seventeen over the period 1993 to 1997.

23. See *Id.*

workers from members of the pit crews to souvenir vendors. There is a portion of this work force that follows the racing circuit. These migrant workers may well take a portion of their earnings with them.

Since a portion of the auto racing industry is national in character, to the extent that they displace locally owned and operated entertainment and leisure industry alternatives, national events likely create greater leakages dollar for dollar than do locally owned entertainment businesses. Of course, the infusion of outside spending relating to the event, spending by outside spectators and television crews for example, increase taxable sales and economic impact. A precise measure of taxable sales increases and economic impact, however, would account for direct and indirect spending diverted from locally owned entertainment alternatives. This diversion can occur either because residents alter their normal pattern of consumption during the event, they may even leave the community to avoid the crowds and associated congestion, or because spending is now directed at commercial entities that exhibit a greater propensity to direct their spending outside the community. A compelling argument can be made for the fact that the national sports industry multiplier is smaller than the multiplier characteristic of locally owned commercial activity crowded out by the national entity. A similar argument can be made for the impact of substituting a national chain store such as Wal-Mart for locally owned retailers, which explains the increasing local resistance to the establishment of a large national retail chain.

The sports multiplier from a national event theoretically would be equal to:

$$\text{Equation (1) } M^{\text{NS}} = 1/1-b+bt_o + m$$

where,

M^{NS} = sports multiplier from an event that is national in character;

b = marginal propensity to consume (mpc);

t_o = tax rate;²⁴

m = marginal propensity to import.

24. The federal, marginal tax rate for race track owners and drivers is likely to be the highest personal income rate, 39.6%, plus the Medicare tax of 1.45% for a total marginal tax rate of 41.05%.

For the sake of illustration, if we assume a value for b , t , and m of .9, .4, and .5, respectively, the sports multiplier is approximately 1.04.²⁵ The value of the multiplier is directly related to the value of b and inversely related to the values of t and m . Since the majority of track revenues are appropriated by high income racetrack owners and drivers, t is likely higher than it would be for entertainment businesses owned and operated by local entrepreneurs.

The local economic impact from a major sports event would then be calculated as the difference between the local value added from the national sports event times the national sports multiplier minus local value added from locally owned and operated entertainment businesses times the local entertainment multiplier.

$$\text{Equation (2) Economic Impact} = VA^{NS} \times M^{NS} - VA^{LOE} \times M^{LOE}$$

where,

VA^{NS} = local value added from the national sports activity;
 VA^{LOE} = local value added from locally owned entertainment activity;
 M^{LOE} = multiplier from locally owned entertainment activity.

For the sake of illustration, if $M^{NS} = .5 M^{LOE}$ and if $VA^{LOE} = .5 VA^{NS}$, then the economic impact from the national sports event is zero. It is reasonable to expect that the value added of a major sports event is larger than the value added of displaced local economic activity simply because it is likely that a national event induces a substantial inflow of money as a consequence of the spending by spectators residing outside the community.

At least one recent study commissioned by the racing industry specified that more than 50% (110,000/210,000) of the spectators at an auto racing event were there for the day of the event only.²⁶ If the single day spectators were all residents of the metropolis, then it is conceivable that VA^{LOE} is equal to only 50% of VA^{NS} . If we further assume that the local and national sports multipliers are the same (we have already indicated that the local multiplier is likely to be larger than the multiplier from a national sports event), then assuming all else equal, the economic impact from the national sports event would be approximately half the

25. This portion of the paper borrows heavily from the work of Baade, *supra* note 14, and Siegfried & Zimbalist, *supra* note 1.

26. See Brickyard 400, *Track and Grounds Quick Facts* (visited Dec. 22, 1999) <<http://www.brickyard400.com/track/dimensions.php3>>.

value estimated if the crowded out locally owned entertainment activity is ignored. If one half of the value of taxable sales leaks from the economy the estimated economic impact must be reduced by 50% once again. Therefore, it is conceivable with these reasonable specifications to conclude that the economic impact is one-fourth or less those estimates provided in some studies commissioned by the racing industry.

CONCLUSIONS AND POLICY IMPLICATIONS

The exaggeration of the economic impact of sporting events in studies commissioned by the sports industry is ubiquitous. It could be argued that the use of these economic analyses by auto racing promoters represents harmless attempts to promote their sport as an equal to the MLB, NBA, NFL, and NHL, but to the extent that these inflated estimates are used to justify public expenditures on speedways, careful economic consideration of these claims must be made.

While historically private individuals and firms have paid for the construction of racetracks around the country, the recent trend has been toward larger and more expensive facilities. As the costs of amenities rise, so too will the temptation to ask for public subsidies to pay for these additions. When some communities begin to subsidize speedways, then greater pressure will be exerted on cities that host speedways or seek one to open the public purse.

Our analysis of the Daytona 500 indicates that for the month of February, the month during which the Daytona 500 is run, the Daytona International Speedway induces an increase in taxable sales for Volusia County of \$41.77 million dollars on average for the past three years (1997-99). Taxable sales and economic impact are not synonymous, however, and there is ample reason to suspect that economic impact is significantly less than the increase in taxable sales. The economic impact for an event that has the capacity to attract spectators from outside the community depends on a myriad of variables that determine changes in net spending and the size of the multiplier. Cities would be well advised to carefully evaluate booster claims that speedways give a high-octane boost to the local economy.

