

## What is the Value of Public Goods Generated by a National Football League Team? A CVM Approach<sup>1</sup>

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### Introduction

Most of the large and growing literature on the public financing of sports stadiums concludes that the costs far exceed the benefits. While most studies measure only the benefits of increased economic activity, including jobs, taxes, and income (e.g., Coates & Humphreys, 1999; Noll & Zimbalist, 1997; Siegfried & Zimbalist, 2000), a few others have attempted to measure the benefits from environmental amenities, or public goods, produced by sports teams. This paper builds on the small literature employing Contingent Valuation Method (CVM) surveys to estimate the value of such public goods produced by sports as civic pride and community spirit.<sup>2</sup>

Johnson and Whitehead (2000) (hereafter JW) first used a CVM survey to estimate the value of sports public goods. They found that construction costs far exceeded the estimated value of public goods for both a new University of

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<sup>2</sup> Another approach, the estimation of compensating wage and rent differentials across cities, is hampered by the fact that major league teams and other cultural amenities are highly correlated with population (Rappaport and Wilkerson, 2001), making it hard to say to what extent the differentials can be attributed to teams rather than museums, ethnic restaurants, and other cultural amenities. One attempt is reported in Carlino and Coulson (2003).

Kentucky basketball arena and a minor league baseball stadium in Lexington, Kentucky.

Johnson, Groothuis, and Whitehead (2001) (hereafter JGW) extended the use of CVM surveys to public goods generated by a major league team. They found that Pittsburgh residents valued the National Hockey League (NHL) Penguins public goods between \$17.2 million and \$48.3 million, far short of the \$200 million needed to build a hockey arena. Fenn and Crooker (2003) found comparable results for the National Football League's (NFL) Minnesota Vikings, with the estimated public goods value much less than the cost of a new stadium.

Rappaport and Wilkerson (2001) criticized the low estimates of JGW by noting the Penguins play the least popular of the major league sports and that, as one of three major league teams in Pittsburgh, the willingness to pay for the Penguins may reflect a diminishing marginal value of sports teams. Siegfried and Zimbalist (2000) suggested another reason that might explain the low willingness to pay for the Penguins. They noted that residents may benefit if they believe a team's presence confers "major league" status on their city—something the Pirates and Steelers would do for Pittsburgh even if the Penguins were to leave.

Rappaport and Wilkerson's criticism of JGW underscores the need for more CVM studies to inform the debate over public subsidy of sports stadiums. Because of the inherent heterogeneities across local economies and sports environments, generalizing from one or two CVM estimates of public goods values is difficult. This paper adds to the CVM evidence by asking, what is the value of public goods generated by the NFL's Jacksonville Jaguars? As its only

major league team, the Jaguars elevated Jacksonville into the ranks of cities with major league teams. The Jacksonville CVM survey asked questions to elicit willingness to pay for the public good of major league status, among others. The survey also allows a test of whether cities derive declining marginal utility from additional sports teams by asking about willingness to pay to attract a National Basketball Association (NBA) franchise to Jacksonville.

The results show residents of Jacksonville value their Jaguars public goods much less than the amount of public money spent on Alltel Stadium's renovation. Jacksonville residents place an even lower value on NBA public goods, consistent with a declining marginal value of teams. The results therefore answer important questions raised by the specifics of the JGW Pittsburgh study and the Fenn and Crooker Minnesota study. The results represent a significant contribution to our knowledge about the value of sports public goods. Section II provides information on Jacksonville and the Jaguars. Section III describes the experimental design and the survey. Next, section IV outlines the empirical model, followed by the results in section V. Finally, section VI includes policy implications and conclusions.

## II. Jacksonville

The Jacksonville metropolitan statistical area (MSA) consists of Duval and three other counties. The city of Jacksonville and Duval County share a merged government. In 2000, Duval County contained 72.8 percent of the MSA's 1,100,491 residents. Jacksonville in the 2000 census was the 46th largest MSA in the U.S. and except for Green Bay, Wisconsin, the smallest market with a team in the NFL, NBA, or Major League Baseball.

To lure an NFL expansion franchise, Jacksonville spent \$121 million to renovate Municipal Stadium, built in 1946. It financed the renovations through a bond issue, various taxes, and its 50 percent share<sup>3</sup> of the stadium naming rights. Renamed Alltel Stadium opened when the Jaguars began play in 1995.

Jacksonville's winning an NFL expansion team in 1993 surprised many observers, who did not consider it a major league city. One columnist wrote, "But Jacksonville?...Was the NFL looking for a small, dumpy city with no TV market, no sports history, and a decrepit stadium?" (Mike Littwin of the *Baltimore Sun*, as quoted in, "What the Columnists are Saying," p. 3C).

Many locals saw the Jaguars as transforming the city's image. "After decades of enduring jokes about their city's backwoods image, Jacksonville business leaders finally believe it is in the same league as the Charlottes, Tampas, and Atlantas of the world" (Williams, 1993). They also thought the Jaguars would improve race relations and unite the various neighborhoods in the widely dispersed city (Stone, 1993).

In expecting greater racial harmony and community spirit, Jacksonvillians were perhaps looking to the experience of other cities. "It's what the janitor, valet parker, lawyer, and venture capitalist can all talk about when they are in an elevator together. Very few things in society could bring people together like a local sports team can," says an attorney for the NFL San Diego Chargers (Rovell, 2002). The Detroit Tigers' 1968 World Series championship has been credited with defusing racial tensions (Miller, 2002).

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<sup>3</sup> Alltel, Inc. pays \$620,000 per year for naming rights for 10 years ending in 2007, half of which goes toward the city's \$121 million commitment.

### III. Experimental Design and Survey

In April 2002, CVM surveys were mailed to a random sample of 1,200 households in Duval County. The Post Office returned 69 surveys as undeliverable, or 5.75 percent of the total. Of the other 1,131 surveys, 421 produced responses, for a response rate of 37.2 percent. Because some people did not answer all the questions, only 367 surveys are used in this analysis.<sup>4</sup>

Variable definitions and summary statistics of the survey data are included in Table 1. As in previous CVM sports surveys, the average respondent is older than the average resident and males responded disproportionately more often than did females. Whites make up 83 percent of the sample but just 67 percent of the Duval County population. This may explain why the sample's self-reported average household income exceeded Duval County household income by about 10 percent, since average white income exceeds average black income nationwide. Of the useable sample, 23 respondents did not report income. We imputed income values in these 23 cases with the conditional mean from a multivariate regression model predicting income.

Insert Table 1 here

The survey booklet contained 42 questions, including 14 about respondents' consumption of public and private goods generated by the

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<sup>4</sup> Recipients first received a postcard alerting them to the imminent arrival of the survey. They received another postcard a week after the survey reminding them to return the survey and thanking them. About a month later, all nonrespondents received another copy of the survey and a letter asking them to complete and return the survey. As an incentive, recipients of either mailing who returned the survey postmarked by a specified date became eligible to win \$100. The reminder postcard and the second survey mailing generated many responses.

Jacksonville Jaguars. The survey presented two contingent valuation scenarios designed to elicit household willingness to pay (WTP) for government policies to 1) ensure that the NFL Jaguars remain in Jacksonville and 2) to attract an NBA team to Jacksonville. Half of the surveys presented the Jaguars scenario first and the NBA scenario second, while the other half reversed the order.

The football scenario informed readers that since 1984 NFL teams have moved to new cities seven times and asked them to suppose that within the next decade the Jaguars' owner decides to sell the team to someone who wanted to move them to another city. It then said, "Suppose the city of Jacksonville was able to buy a majority of the team. If the city owned a majority of the team the Jaguars would never have to leave Jacksonville. Large sums of money from Duval County taxpayers would be needed to buy a majority of the team. It has been estimated that it would take annual tax payments of TAX for the next T years from each Duval County household to buy a majority of the team. Your total payment would be  $TAX \times T$ ." The annual tax payments TAX and the number of years T varied across the surveys, as explained below.

A dichotomous choice question followed: "Would you be willing to pay the annual tax payments of TAX for the next T years out of your own household budget so the city of Jacksonville could buy a majority of the Jaguars?" A payment-card question followed: "What is the highest annual tax payment you would be willing to pay for the next T years out of your own household budget to keep the Jaguars in Jacksonville?" Response categories were "zero," "between

\$0.01 and \$4.99,” “between \$5 and \$9.99,” “between \$10 and \$19.99,” “between \$20 and \$39.99,” “between \$40 and \$75,” and “more than \$75.”

The basketball scenario informed readers that NBA teams occasionally move and asked respondents to imagine Jacksonville could attract an NBA team sometime in the next decade if the city upgrades its arena to NBA standards. It then said, “Large sums of money from Duval County taxpayers would be needed to upgrade the new arena in Jacksonville to NBA standards. It has been estimated that it would take annual tax payments of TAX for the next T years from each Duval County household to upgrade the new arena. Your total payment would be  $TAX \times T$ .” As in the football scenario, dichotomous choice and payment card WTP questions followed.

In the football scenario the annual payment TAX could take the values of \$5, \$10, \$20, or \$40 and the number of years T could be 10 or 20. In the basketball scenario, the annual payments also took the same values of \$5, \$10, \$20, or \$40. The basketball scenario always presented a payment period one half as long as that in the football scenario, that is, either five or 10 years. Half of the surveys presented the football scenario first while the others presented basketball first. Given the permutations of the scenario ordering and the different TAX and T values, 16 versions of the survey were sent out.

Both the football and basketball scenarios concluded with a pair of questions asking people their reasons for their responses to the willingness to pay questions. The survey ended with questions about household size, gender, race, age, tenure in Jacksonville, income, education, and voting behavior.

#### IV. Theory and Empirical Model

To illustrate the economic theory serving as the foundation for CVM analysis, consider the following example. Suppose Mary achieves a certain reference level of utility from her consumption of goods and services, including the goods produced by a local sports team. If she is rational, she will achieve this reference level of utility by minimizing her expenditures to achieve that reference level of utility.

If the local sports team leaves town, Mary's utility will fall below its reference level because she will no longer be able to consume private and public goods produced by the team. To return to the reference level, she will have to spend more on other goods and services. For instance, if she spent \$100 per year on the team, she might have to spend \$110 per year on other goods to achieve the same utility she got from the team. The difference in the two spending levels, in this case \$10, is defined as the annual willingness to pay (AWTP) to keep the team in the local market. Therefore, AWTP is the difference in spending needed to achieve the reference level of utility without the team and the spending needed with the team.

Annual willingness to pay (AWTP) consists of willingness to pay for use values, or private goods, and nonuse values, or public goods. Annual use value is the difference between total willingness to pay and the willingness to pay for



nonuse value. For people who value any sports goods, whether public or private, AWTP is positive. For those who do not value sports goods, AWTP is zero.<sup>5</sup>

The CVM survey sent to Jacksonville was designed to elicit AWTP and through the questions asked about consumption of sports private and public goods, to allow willingness to pay to be broken into use and nonuse values.

The empirical model uses the payment-card willingness to pay data from the survey. Respondents first decide whether to pay anything and if so, how much. If utility with the team exceeds utility without the team, then WTP is greater than zero.

Total willingness to pay (TWTP) equals the product of annual willingness to pay and the number of years in the payment period. The expected value of TWTP is the product of the probability that TWTP is positive and total willingness to pay, given that TWTP is positive, or

$$(1) \quad E(TWTP) = \pi(TWTP > 0) \times E(TWTP | TWTP > 0).$$

The Tobit model, which accounts for the censoring of the willingness to pay amounts at zero, is used to estimate the determinants of willingness to pay.

The following equations were estimated for the Jaguars and NBA team,

$$(2) \quad E(TWTP | TWTP > 0) = f(TAX, LONG, FIRST, GAMES, AGE, INCOME)$$

where the variables are as defined in Table 1. The following alternative model is also estimated for the Jaguars.

$$(3) \quad E(TWTP | TWTP > 0) = f(TAX, LONG, FIRST, GAMES, AGE, INCOME, \\ PUBGOOD, MAJOR, RACERELA, PERSONAL)$$

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<sup>5</sup> For a more rigorous development of the theory of willingness to pay for sports public goods, see Johnson and Whitehead (2000) or Johnson, Grootuis, and Whitehead (2001).

Including TAX in the model allows the detection and correction of starting point bias arising from the initial dichotomous choice WTP question. Starting point bias exists when a suggested value affects subsequent valuation responses.

The number of Jaguars games attended during the past year and the number of potential NBA games attended measure the intensity of use of the sports teams. Games attended are potentially endogenous. An instrumental variables approach and a simultaneous equations Tobit model were used to test for endogeneity. The instrumental variables approach includes the predicted value of games as a covariate in the willingness to pay model. The simultaneous equations model jointly estimates the determinants of games and willingness to pay with correlated error terms (Whitehead, forthcoming). We find no evidence of endogeneity bias. Inclusion of the games variable relative to the endogeneity models does not affect the estimation of willingness to pay or the decomposition of willingness to pay into use and nonuse values.<sup>6</sup>

The variable PUBGOOD measures the consumption of four Jaguars public goods. The survey asked people how often they read about the Jaguars, discuss them with others, listen to sports talk radio when the Jaguars are the topic, and wear Jaguars clothing. PUBGOOD is the number of activities engaged in at least once a week so, for instance, people doing three of the four activities have a PUBGOOD value of three.

Several variables measure consumption of other Jaguars public goods. For those who said yes to, “do you think having the Jaguars in town puts Jacksonville ‘on the map,’ just like other ‘major league’ cities?” the dummy variable MAJOR

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<sup>6</sup> These results are available upon request from the authors.

takes a value of one. For those who agreed that “having the Jaguars in town helps improve relations between whites, African-Americans, Hispanics, and other groups,” the dummy variable RACE takes a value of one. Psychologists have noted sports fans may feel a sense of personal victory when their teams win (End, Dietz-Uhler, and Harrick, 2002). For respondents who said a Jaguars win “always,” “usually,” or “sometimes” feels like a personal victory, PERSONAL takes a value of one. The coefficients on PUBGOOD, MAJOR, RACE, and PERSONAL should be positive.

## V. Results

Tobit regression results appear in Table 2. The dependent variable is TWTP, or annual willingness to pay times the payment period. For instance, TWTP for those who said they were willing to pay \$25 per year for 10 years is \$250.

Insert Table 2 here

In the NBA Tobit model, several factors increase TWTP. If the NBA scenario appears first total willingness to pay rises by \$33.75.<sup>7</sup> Total willingness to pay is \$23.59 higher if the payment period is longer. Total willingness to pay increases by \$4.77 for each game the respondent expects to attend. Also, the NBA team is a normal good with a positive and statistically significant coefficient on income. But willingness to pay for the NBA falls with the age of the respondent, and the insignificant coefficient on TAX indicates that starting point bias is not present.

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<sup>7</sup> All hypothesis testing is conducted at the five percent level of significance.

In the NFL(1) Tobit model, willingness to pay also rises in the long scenario, by about \$44.09. The marginal Jaguars game attended is worth \$35.50, compared to \$4.77 for the marginal NBA game. This may reflect relative scarcities, with eight home games in the NFL versus 41 in the NBA. None of the other independent variables are statistically significant at the five percent level. Starting point bias does not exist and total willingness to pay does not differ whether the NFL scenario is presented first or second. The coefficients on income and age are not statistically significant.

The NFL(2) model includes more measures of public goods and nonuse values than the first model. In the second model, in contrast to the first, total willingness to pay rises with income and falls with age. Total willingness to pay is higher if respondents think that the Jaguars make Jacksonville a major city or if they think they improve race relations. The coefficient on PERSONAL is not significant at the five percent level, so those thinking a Jaguars win is a personal victory are not willing to pay more. The significance of other variables included in the first model remains unchanged.

Table 3 presents estimated total willingness to pay per household. The variable FIRST is set as if the NBA and NFL scenarios were both presented first and the payment period is set for the longer time period, 10 years for the NBA and 20 years for the Jaguars. Both decisions either raise willingness to pay or leave it unaffected. Mean values of all other variables are used. The first NFL model is used for the football scenario.

Insert Table 3 here

Table 3 also shows total willingness to pay broken down into use and nonuse values. Nonuse value is estimated by setting the game attendance variables equal to zero, with all other variables set at their mean values. Use value is the residual difference between total willingness to pay and nonuse value. Total willingness to pay for the NBA over the long period (10 years) is \$81.63, or about \$8.16 per year. Use value is 28 percent of total willingness to pay for the NBA. Total willingness to pay for the Jaguars is \$148.36 over the long period (20 years), or about \$7.42 per year. Use value is 30 percent of total willingness to pay for the Jaguars.

## VI. Policy Implications and Conclusions

The annual willingness to pay reported in Table 3 represents the estimated annual benefits per household generated by the Jaguars and an NBA team in Jacksonville. The discounted present values of those benefits represent the capital values of the benefits per household. In discounting the annual benefit streams, we employed two different discount rates, two percent and seven percent, as recommended by the Congressional Budget Office and the Office of Management and Budget, respectively, for benefit cost analyses of federal programs (Hartman, 1990; Office of Management and Budget, 1992).<sup>8</sup> To determine whether the benefits generated by a team exceed the costs of a subsidy, the capital values of the benefits must be aggregated over all households so the total can be compared to the subsidy.

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<sup>8</sup> JGW used an 8 percent discount rate. Rappaport and Wilkerson discounted JGW's estimated willingness to pay at 6 percent.

To aggregate the capital values across households, we multiplied the estimated capital values per household by the total number of households in the Jacksonville MSA.<sup>9</sup> This provides an upper bound to the capital values because it assumes that the non-respondent households, had they answered the surveys, would have answered them in the same way as the respondent households.<sup>10</sup> If, however, non-respondents did not return the surveys because they had no interest in sports and no willingness to pay, the upper-bound estimates are too high.

Lower-bound estimates are computed by multiplying the upper-bound estimates by the survey response rate of 37.2 percent on the assumption that the non-response rate reflects a willingness to pay nothing. The lower bound estimates almost certainly understate true WTP since some nonrespondents would have been willing to pay some positive amount but may have failed to return their surveys for a variety of reasons—they may have lost them, not read them, or not wanted to fill them out. The true aggregate capital values for the MSA likely lie somewhere between the upper and lower bounds.

Table 4 shows the upper and lower bound capital values for the Jaguars discounted at both two percent and seven percent. Even at two percent, the upper-bound capital value of keeping the Jaguars in town is less than \$53 million, while the lower-bound value is \$19.6 million, compared to \$121 million in public money provided for the renovation of Alltel Stadium. At a seven percent discount,

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<sup>9</sup> We assume the households in counties other than Duval are otherwise identical to those in Duval County in terms of their willingness to pay.

<sup>10</sup> If households beyond the MSA would be willing to pay to keep the Jaguars in town or to attract an NBA team, even these upper bound aggregate values are understated because no households beyond the MSA are included in the estimates.

the upper-bound capital value falls below \$36 million, the lower-bound to \$13.3 million.

Insert Table 4 here

Table 4 also shows the breakdown of the capital values into use values, or private goods values, and nonuse values, or public goods values. The upper-bound capital value of public goods discounted at two percent is about \$36.5 million. The lower-bound value is about \$13.6 million. Discounted at seven percent, the upper and lower bound values drop to about \$24.8 million and \$9.2 million.

Table 5 shows the present discounted aggregate willingness to pay to attract an NBA team. The same discount rates and aggregation procedures used in the NFL calculations in Table 4 were used in Table 5. Because survey respondents indicated a lower willingness to pay for an NBA team than for the Jaguars, the capital values reported in Table 5 are much lower than those in Table 4. The upper-bound willingness to pay, discounted at two percent, is about \$31.8 million, of which just about \$22.8 million is for nonuse value. The lower-bound value is about \$11.8 million, of which about \$8.5 million is for nonuse value.

Insert Table 5 here

The estimated use values reported in Tables 4 and 5 represent the value of consumer surplus derived by Jacksonville residents from attending games. Alexander, Kern, and Neill (2000) and Irani (1997) estimated consumer surplus from attending games using known ticket prices and by making assumptions about the elasticity of demand. Their estimates of consumer surplus exceed those produced by this CVM survey.

While consumer surplus is usually counted in benefit cost analyses, it may not be appropriate to do so in the case of publicly financed stadiums. Major league sports teams enjoy substantial local monopoly power given their exclusive territories. Teams have begun to increasingly exploit their market power to extract as much consumer surplus as possible. They do so through price discrimination, for example, quantity discounts in the form of season tickets and other multiple games packages. They also do so through two-part tariffs such as personal seat licenses. To the extent that consumer surplus can be captured through such pricing mechanisms, the teams can force fans to pay closer to their reservation prices for the private sports goods they consume. Surplus that is able to be captured by teams cannot be used to justify public subsidy on efficiency grounds.

Compared to typical construction costs exceeding \$300 million for a new football stadium and \$200 million for a new NBA arena, the nonuse values estimated in Duval County fall far short of the amounts needed to construct new stadiums. The upper bound estimated MSA nonuse value for the Jaguars even falls far short of the \$121 million city-paid renovation costs of Alltel Stadium.

The upper and lower bound nonuse values for the Penguins estimated by JGW were \$48.3 million and \$17.2 million, substantially higher than the Jaguars values estimated here, and the Penguins values were calculated using an eight percent discount rate. Had JGW discounted the Penguins WTP at two percent, the gap between the Penguins and Jaguars figures would have been much higher. This may seem somewhat surprising since the NFL is far more popular than the NHL



and the Penguins, as one of three major league teams in Pittsburgh, should have less impact than the Jaguars.

Two factors help explain the discrepancy. First, the Penguins figures rest on the assumption people would pay the annual taxes in perpetuity, but respondents may have had a finite period in mind. If many respondents assumed a short payment period, the JGW estimates overstate true WTP.

Second, Pittsburgh is bigger than Jacksonville. It has about 950,000 MSA households to Jacksonville's 425,000. Even if per capita WTP were twice as high in Jacksonville, the aggregate willingness to pay for the Penguins would exceed that for the Jaguars.

Willingness to pay for the NBA team was even lower than the Jaguars. Several possible reasons exist. First, an NBA team would be the second major league team in Jacksonville and consequently the marginal impact on Jacksonville's status as a major league city and on other sports public goods would be less than the Jaguars'. Second, the most popular sport among the respondents was football, with those naming the NFL as their favorite sport outnumbering those naming the NBA as their favorite by a ten to one margin. Third, the endowment effect may be at work. Specifically, people place a higher value on goods they already own than on similar goods they do not own.

The low aggregate net present values of the public goods generated by the Jaguars and a potential NBA team make it hard to justify large public subsidies to teams on the basis of public goods, especially when considered with JW, JGW, and Fenn and Crooker.

If some critics of CVM are correct, even the low figures found in CVM sports studies are overstated. They claim CVM overstates WTP for public goods and WTP estimates should be calibrated to correct for hypothetical bias. The National Oceanic and Atmospheric Administration in 1994 proposed a default calibration of dividing reported WTP by two to correct for bias in environmental CVM analyses (Diamond & Hausman, 1994). To the extent the critics are correct, the estimates reported in this paper for the value of public goods generated by the Jaguars, low as they are, may nevertheless be biased upward.<sup>11</sup>

Even if the Jacksonville estimates are not biased upward, much larger cities with similar per capita WTPs would be unable to justify paying the full cost of a new basketball arena or outdoor stadium. For example, the Chicago MSA is about nine times as large as Jacksonville. If Chicagoans have the same discounted per capita willingness to pay for football public goods as Jacksonvillians, the aggregate upper bound WTP would be about \$329 million, discounted at two percent. Discounted at seven percent, Chicago's upper bound would only be about \$223 million. However, Chicago has five major league teams, so per capita WTP may be less than in Jacksonville. If so, Chicago's aggregate WTP would be less than these estimates. It is unlikely that the recent \$600 million renovation of city-owned Soldier Field, home of the NFL Bears, could be justified by the Bears' public goods value.

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<sup>11</sup> To the extent that nonresidents of the MSA may benefit from the Jaguars, the results reported here underestimate the value of public goods. However, since NFL teams do not market themselves beyond a radius of 75 miles and since other NFL teams in Florida and Georgia provide public goods not far from Jacksonville, we assume Jaguars public goods beyond the MSA provide little value.

Because the Jaguars have not threatened to relocate to another city, it is possible that some survey respondents may have underestimated their willingness to pay, because they have never been forced to seriously consider the possibility of losing their team. Fenn and Crooker (2003) used CVM to estimate willingness to pay for the NFL Minnesota Vikings, a team that has threatened to relocate. The low values of WTP found by Fenn and Crooker suggest that the Jacksonville results would not change much if the perceived probability of relocation were to increase substantially.

Since every city and sport is to some extent unique, caution must be exercised in generalizing the Jacksonville results to other cities. However, the evidence from CVM studies, including Johnson and Whitehead, JGW, Fenn and Crooker, and now Jacksonville, weighs heavily against the notion that the public goods values approach the costs of stadium subsidies. The Jacksonville results, in particular, suggest that the willingness to pay for a team that provides its city with major league status is not very high and that the marginal value of additional teams is declining. Coupled with the large body of literature finding negligible economic impact of teams and stadiums on city and regional economies, the CVM results strengthen the case against public subsidy. Nevertheless, given the uniqueness of each case, additional CVM research is recommended to test other scenarios involving other leagues, teams, and cities.

Table 1. Descriptive Statistics

Variable	Description	NBA		NFL	
		Mean	Std.Dev.	Mean	Std.Dev.
TWTP	Annual TAX x Years	60.15	135.05	161.04	321.20
TAX	Annual TAX	18.98	14.08	19.06	14.05
FIRST	1 if NBA/NFL scenario presented first	0.51	0.50	0.49	0.50
LONG	1 if NBA/NFL pay period is 10/20 years	0.50	0.50	0.50	0.50
GAMES	Number of games attended/season	2.97	6.85	1.50	2.39
AGE	Age in years of respondent	51.94	15.91	51.94	15.91
INCOME	Annual income in \$1,000s	57.51	27.40	57.51	27.40
MAJOR	1 if Jaguars put Jax on map			0.74	0.44
RACERELA	1 if Jags improve race relations			0.43	0.50
PUBGOOD	Number of 4 NFL public goods consumed			1.86	1.44
PERSONAL	1 if Jags win feels like own victory			0.31	0.46

All results based on nonmissing observations.

Table 2. Tobit Regression Models: Dependent Variable = WTP

	NBA			NFL (1)			NFL (2)		
	Coeff.	t-ratio	Marg. Effect	Coeff.	t-ratio	Marg. Effect	Coeff.	t-ratio	Marg. Effect
ONE	-173.26	-2.83	-56.67	-276.93	-2.01	-117.59	-655.81	-4.45	3.46
TAX	-2.35	-1.49	-0.77	3.14	1.45	1.33	2.41	1.16	0.92
FIRST	103.17	3.65	33.75	-20.59	-0.34	-8.74	3.46	0.06	1.32
LONG	72.11	2.43	23.59	103.82	1.72	44.09	117.06	2.04	44.76
GAMES	14.58	11.06	4.77	83.59	6.52	35.5	31.15	2.35	11.91
AGE	-1.78	-2.12	-0.58	-2.37	-1.2	-1.01	-5.73	-2.87	-2.19
INCOME	1.43	2.84	0.47	1.36	1.17	0.58	1.97	1.75	0.75
PUBGOOD							111.42	4.17	42.61
MAJOR							332.42	3.62	127.12
RACERELA							153.3	2.41	58.62
PERSONAL							105.73	1.55	40.43
<i>Heteroskedasticity</i>									
TAX	0.02	3.52							
$\sigma$	156.99	11.79		500.95	16.82		453.42	17.18	
Log-Likelihood	-1039.28			-1389.5			-1346.97		

Table 3. Willingness to Pay Estimates

	NBA	t-ratio	NFL	t-ratio
Total Willingness to Pay	81.63	4.48	148.36	5.28
Nonuse Value	58.52	3.75	102.82	4.42
Use Value	23.11	7.23	45.53	5.53

Table 4. Estimated Aggregate Discounted Willingness to Pay for NFL

		Upper bound			
		discounted at 2 percent		discounted at 7 percent	
	per household	aggregate MSA	per household	aggregate MSA	
Total	\$123.75	\$52,666,020	\$84.11	\$35,795,870	
NUV	\$85.73	\$36,485,316	\$58.26	\$24,794,524	
UV	\$38.02	\$16,180,704	\$25.85	\$11,001,346	

*The figures above are based on 2000 census figures of 425,584 households in the Jacksonville MSA. Calculate the aggregate MSA WTP (425,584) x (household WTP).*

		Lower bound			
		discounted at 2 percent		discounted at 7 percent	
	per household	aggregate MSA	per household	aggregate MSA	
Total	\$123.75	\$19,591,759	\$84.11	\$13,316,064	
NUV	\$85.73	\$13,572,538	\$58.26	\$9,223,563	
UV	\$38.02	\$6,019,222	\$25.85	\$4,092,501	

*The lower bound figures equal the upper bound figures times the response rate of 37.6 percent. The aggregate NUV and UV figures may not sum to the total because of rounding.*

Table 5. Estimated Aggregate Discounted Willingness to Pay for NBA

Upper bound				
discounted at 2 percent		discounted at 7 percent		
per household	aggregate MSA	per household	aggregate MSA	
Total	\$74.76	\$31,816,660	\$61.32	\$26,096,811
NUV	\$53.69	\$22,811,302	\$44.04	\$18,708,673
UV	\$21.26	\$9,005,357	\$17.43	\$7,388,138

*The figures above are based on 2000 census figures of 425,584 households in the Jacksonville MSA. Calculate the aggregate MSA WTP (425,584) x (household WTP). The aggregate NUV and UV figures may not sum to the total because of rounding.*

Lower bound				
discounted at 2 percent		discounted at 7 percent		
per household	aggregate MSA	per household	aggregate MSA	
Total	\$74.76	\$11,835,797	\$61.32	\$9,708,014
NUV	\$53.69	\$8,485,805	\$44.04	\$6,959,626
UV	\$21.26	\$3,349,993	\$17.43	\$2,748,387

*The lower bound figures equal the upper bound figures times the response rate of 37.6 percent. The aggregate NUV and UV figures may not sum to the total because of rounding.*



## References

- Alexander, D. L., Kern, W. & Neill, J. (2000). Valuing the consumption benefits from professional sports franchises. *Journal of Urban Economics*, 48(2), 321- 337.
- Bockstael, N., Strand, Jr. I. E., McConnell, K. E., & Arsanjani, F. (1990). Sample selection bias in the estimation of recreation demand functions: An application to sportfishing. *Land Economics*, 66(1), 40-49.
- Carlino, G. & Coulson, N.E. (2003, October). Compensating differentials and the social benefits of the NFL. Federal Reserve Bank of Philadelphia, Working Paper No. 02-12/R.
- Coates, D. & Humphreys, B. R. (1999). The growth effects of sports franchises, stadia, and arenas. *Journal of Policy Analysis and Management*, 18(4), 601-24.
- End, C. M., Dietz-Uhler, B., & Harrick, E. A. (2002). Identifying with winners: A reexamination of sport fans' tendency to BIRG. *Journal of Applied Social Psychology*, 32(5), 1017-1030.
- Fenn, A. J., & Crooker, J. R. (2003). *The willingness to pay for a new Vikings stadium*. Paper presented at the 2003 Western Economic Association Meetings, Denver, CO.
- Irani, D. (1997). Public subsidies to stadiums: Do the costs outweigh the benefits? *Public Finance Review*, 25, 238-253.

- Johnson, B. K., & Whitehead, J.C. (2000). Value of public goods from sports stadiums: The CVM approach. *Contemporary Economic Policy*, 18(1), 48-58.
- Johnson, B. K., Groothuis, P. A., & Whitehead, J. C. (2001). The value of public goods generated by a major league sports team: The CVM approach. *Journal of Sports Economics*, 2(1), 6-21.
- Miller, John J. (2002, July 30), A city on fire, *National Review*, retrieved from Lexis-Nexis.
- Mitchell, R. C. & Carson, R. T. (1989). *Using Surveys to Value Public Goods: The Contingent Valuation Method*, Resources for the Future, Washington, D.C.
- Noll, R. G., & Zimbalist, A. (1997). The economic impact of sports teams and facilities,” In R. G. Noll, & A. Zimbalist (Eds.), *Sports, jobs, and taxes: The economic impact of sports teams and stadiums* (pp. 55-91). Washington, DC: The Brookings Institution.
- Office of Management and Budget, Circular No. A-94 Revised (Transmittal Memo No. 64), Washington, DC, October 29, 1992. URL: <http://www.whitehouse.gov/omb/circulars/a094/a094.html>.
- Rappaport, J. & Wilkerson, C. (2001). What are the benefits of hosting a major league sports franchise? *Federal Reserve Bank of Kansas City Economic Review*, First Quarter, 55-86.
- Rovell, D. (2002, September 19) *What's the lease you can do?* Retrieved from <http://sports.espn.go.com/espn/print?id=1434048&type=story>).

Stadiums and arenas under construction. (2002, December 30). *Sports Business Journal*, 5(36), 48-49.

Stone, A. (1993, December 2). Jacksonville 'ready to take off'/NFL franchise seen as a catalyst. *USA Today*, p. 10A.

Siegfried, J. & Zimbalist, A. (2000). The economics of sports facilities and their communities. *Journal of Economic Perspectives*, 14(3), 95-114.

What the columnists are saying. (1993, December 2). *USA Today*, p. 3C.

Whitehead, John C., "Combining Contingent Valuation and Behavior Data with Limited Information" *Resource and Energy Economics*, forthcoming.

Williams, M. (1993, December 12). NFL team boosts Jacksonville's image. *Atlanta Constitution*, p. H6