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Valuing the Private Consumption Benefits of the College Football Game Experience

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Private consumption benefits arise when the cost an individual is willing to pay to attend a sporting event is greater than the actual cost incurred by the individual. The amount of money the individual is willing to pay above actual expenditures is a benefit or welfare gain to the individual (i.e., consumer surplus). The purpose of this study was to estimate the value of private consumption benefits derived by individuals from the college football game experience. The study's response rate was 56.9% with a sample size of n=769. Results revealed state residents visiting a southeastern university to participate in the college football game experience derived \$168.80 per person per game in private consumption benefits. Aggregating the private consumption benefits derived by state residents suggest the utilization of public resources (e.g., institutional support) to support the university's athletic program would be justified. In addition, management applications are provided to assist decision makers in the utilization of these findings.

Introduction

In the past few decades, local governments and municipalities have spent billions on new construction or major renovation projects of professional sports facilities (Howard & Crompton, 2004; Rappaport & Wilkerson, 2001). Given the proliferation of public subsidies to support these

construction projects, university athletic departments are emulating their professional counterparts. For example, in 2005, the University of Minnesota proposed to the State legislature the construction of a new on-campus football stadium, costing approximately \$288 million ("Partners in Excellence," 2008). The legislature approved the project with the State of Minnesota and the University sharing the financial obligations, resulting in the State being responsible for 48% of the project or \$137.2 million. Similarly, in 2009, the University of Washington petitioned the state government for \$150 million in public subsidies to renovate Husky Stadium, the university's on-campus football stadium (Condotta, 2009). Although the majority of athletic departments fund sport facility construction and renovation projects with athletic revenues and private donations, many are noticing the exorbitant amount of public subsidies committed to professional sport teams.

The main justification given by political leaders for the utilization of public funds on sports stadiums and arenas is the anticipated spur in economic development (Noll & Zimbalist, 1997). Proponents of using public subsidies for construction and renovations of sports facilities suggest the expenditures of individuals attending sport competitions at the facilities are the impetus for job creation and an increase in personal income for local residents (Siegfried & Zimbalist, 2000). In other words, the main economic tool utilized by political leaders and sports franchise owners to justify the use of public subsidies is economic impact analysis.

Although economic impact studies can provide valuable information to decision makers, impact studies commissioned to defend sports stadium projects have received much criticism (Rappaport & Wilkerson, 2001). Crompton (1995) asserts that "Too often, the motives of those commissioning an economic impact analysis appear to lead to adoption of procedures and underlying assumptions that bias the resultant analysis so the numbers support their advocacy position" (p. 15). One of the most common mischievous procedures employed to upwardly bias economic impact estimates is the inclusion of local residents (Crompton, 2006). Expenditures made by residents at sporting events do not contribute to the event's economic impact because these expenditures represent a reallocation of existing funds in the local economy from one sector to another (Crompton, 1999). In addition, Noll and Zimbalist (1997) argue that economic impact analysis commissioned by supporters of public subsidies for sports stadiums and facilities typically overestimate the team's ability to attract tourists' expenditures and to retain these expenditures in the local economy.

While academic researchers agree the justification for public subsidies based on the economic impact argument is not convincing (Coates & Humphreys, 1999; Siegfried & Zimbalist, 2000), these same researchers purport the existence of other economic contributions which could be large enough to justify the allocation of public funds on sports teams and facilities (Alexander et al., 2000; Barget & Gouguet, 2007; Siegfried & Zimbalist, 2002). Alexander et al. (2000) indicate sports teams produce other economic contributions in the form of consumption benefits. Two types of consumption benefits, public and private, can be derived by individuals. Zimmerman (1997, p. 121) suggests residents derive public consumption benefits from the satisfaction "from living in a 'big league' town, from having another topic of conversation that is common to most citizens, from reading about its [the team] successes and failures in the newspaper." Public consumption benefits can be derived by all individuals in the locality whether they attend sport competitions or not. On the other hand, private consumption benefits are only derived by individuals who attend sporting events (Alexander et al., 2000). Private consumption benefits arise when the cost an individual is willing to pay to attend a sporting event is greater than the actual cost incurred by the individual. The amount of money

the individual is willing to pay above actual expenditures is a benefit or welfare gain to the individual (i.e., consumer surplus or net willingness to pay).

In discussing the consumption benefits of sports teams, Noll and Zimbalist (1997) state:

These benefits may be large enough to offset the subsidy, even if the team has no net effect on local economic activity, although quantifying them is extremely difficult. Most likely, these consumer benefits presumably are the real reason that cities are willing to spend so much on attracting and keeping a team (p. 87).

Other researchers agree that the consumption benefits, both private and public, produced by sports teams can be significant (Alexander et al., 2000; Barget & Gouguet, 2007; Irani, 1997). However, Noll and Zimbalist (1997) suggest the consumption benefits of sports teams is an area of research that has been overlooked.

Estimating the value of public consumption benefits is beginning to receive attention in decisions regarding the allocation of public funds to sports teams and facilities (Barget & Gouguet, 2007; Johnson, Mondello, & Whitehead, 2007; Johnson, Groothuis, & Whitehead, 2001). In this type of analysis, researchers are concerned with estimating the value of the public goods generated by sports teams. Participants in this type of study include residents who attend sporting events and those who do not attend sporting events (Johnson et al., 2001). An average value of the public consumption benefits derived by residents is multiplied by the population in the locale to determine the net value of public consumption benefits. Researchers compare this net value to the total costs of the proposed project in order to determine whether public subsidies are justified.

Estimating the value of private consumption benefits has received considerably less attention in the literature (Alexander et al., 2000). In this type of analysis, researchers are interested in estimating the consumer surplus (i.e., private consumption benefits) derived by individuals who attend sport competitions (Alexander et al., 2000). Participants in this type of study only include residents that actually attend the sporting event. An average value of private consumption benefits derived by residents is multiplied by the number of residents that attend the sport competition to determine the net value of private consumption benefits. This net value is compared to the cost of the proposed project to evaluate whether the public subsidies are justified.

Barget and Gouguet (2007) propose the total economic value of a sports team or sporting event includes an estimate of both use (i.e., private consumption benefits) and non-use values (i.e., public consumption benefits). Since previous research suggests sport teams and facilities fail to provide a significant economic impact on local regions, academic researchers purport the economic valuation of sport teams and facilities should shift away from economic impact assessment and shift towards a cost benefit framework (Barget & Gouguet, 2007; Mules & Dwyer, 2005; Siegfried & Zimbalist, 2002). In a cost benefit framework, the monetary value of both private (i.e., use) and public (i.e., non-use) consumption benefits of sporting events are necessary components (Barget & Gouguet, 2007; Alexander et al., 2000). Carlsen, Getz, and Soutar (2001) state “this is the area in need of most conceptual thought and development of new measures that may be drawn from other disciplines such as economics” (p. 254).

With this call for more research on consumption benefits of sport teams and facilities, researchers began to implement techniques from economics, such as the contingent valuation method (CVM), to estimate a monetary value for these benefits. The few published studies

attempting to estimate the value of these consumption benefits focused on public consumption benefits, while far less attention has been given to the measurement of private consumption benefits (Alexander et al., 2000; Irani, 1997). Irani (1997) purports the estimation of private consumption benefits “is an important benefit left unexamined in the literature” (p. 241). In addition, the majority of research on the consumption benefits of sports teams and facilities focuses on professional sports teams. Comparatively, very little research concentrates on the economic contributions of college athletics on local communities (Gumprecht, 2003). With the dearth of academic research concentrating on the economic contributions of college athletics, an estimate of the private consumption benefits produced by college sports teams seems relevant.

To the authors’ knowledge, no research has been conducted to estimate the private consumption benefits derived by individuals attending college sporting events. Estimating the private consumption benefits generated by sports teams and facilities is a vital piece of information required in the evaluation process of competing programs (Irani, 1997). Barget and Gouguet (2007) imply an estimate of private consumption benefits is a necessary component in determining the total economic value of a sporting event. Similarly, Mules and Dwyer (2005) suggest researchers conducting a cost benefit analysis of a sports project should include an estimate of consumer surplus derived by local residents attending the sporting event (i.e., private consumption benefits).

Literature Review

When individuals attend a sporting event, the amount a spectator is willing to pay to attend the event above their actual trip expenditures is equivalent to private consumption benefits (i.e., consumer surplus). Although sports teams set ticket prices at a level to extract as much rent as possible from spectators, sport franchises may not capture all the rent the sport consumer is willing to pay. Municipalities accrue this uncaptured rent in the form of net consumer surplus, resulting in an increase to the region’s welfare (Alexander et al., 2000). Bateman and Willis (1999) and Loomis and Walsh (1997) indicate the travel cost and contingent valuation methods are appropriate techniques utilized to estimate the use value (i.e., private consumption benefits) derived by individuals from a recreation or leisure experience.

Irani (1997) performed the seminal work on estimating the private consumption benefits (i.e., consumer surplus) produced by professional sport teams. The purpose of this research was to measure the dollar value of a city’s welfare gain by developing a demand curve for baseball games and estimating the net consumer surplus from the derived demand curve. Utilizing available secondary data on annual attendance for Major League Baseball (MLB) teams and ticket prices, Irani (1997) developed an attendance function for MLB games based on demand for tickets. Using his parameter estimates and actual attendance data, Irani calculated the consumer surplus from attendance for each MLB team. The calculations resulted in consumer surplus estimates for MLB teams that ranged from \$2.2 million to \$54.1 million with an average of \$18 million. Irani (1997) indicates communities considering the allocation of public funds on sport teams or facilities must include estimates of consumer surplus in the cost benefit analysis.

Alexander, Kern, and Neill (2000) assert sport teams generate private consumption benefits which are equivalent to consumer surplus derived by attendees of games. Alexander et al. (2000) identified Irani (1997) as the seminal research measuring private consumption benefits. However, the authors suggest an alternative procedure for estimating consumers’ surplus using available secondary data on team’s annual revenues from ticket sales and the price

elasticity of attendance. Results from the analysis demonstrate professional sport teams produce significant private consumption benefits. Based on the range of price elasticities used in the analysis, MLB teams produce consumer surplus between \$8.6 million and \$25.7 million annually, while National Football League teams generate consumer surplus between \$7.5 million and \$22.6 million annually. In addition, Alexander et al. (2000) estimated the consumer surplus for National Basketball Association (NBA) and National Hockey League (NHL) teams. Results revealed NBA teams create consumer surplus between \$7.8 million and \$23.3 million annually, whereas NHL teams provide consumer surplus between \$8.5 million and \$25.6 million annually. Alexander et al. (2000) suggest estimates of private consumption benefits need to be quantified in order to assist decision makers in cost benefit analysis.

Barget and Gouguet (2007) evaluated the total economic value of a sporting event. These authors proposed the total economic value of a sporting event is comprised of the use (i.e., private consumption benefits) and the non-use value (i.e., public consumption benefits). The sporting event investigated was a Davis Cup Quarterfinal match between France and Germany in Limoges, France during April 1996. In order to estimate the use value of the event, the authors employed the zonal travel cost method. The contingent valuation method was utilized to estimate the non-use value of the event. Data were gathered over the three day event using on-site questionnaires. Analysis of the data revealed spectators derived €58,558 in private consumption benefits from attending the sporting event, and €322,696 in public consumption benefits. Barget and Gouguet (2007) concluded by implying the estimation of private and public consumption benefits are necessary to demonstrate the various economic values produced by sporting events.

As previously mentioned, the existing literature related to the estimation of private consumption benefits of sporting events is sparse. Previous research on private consumption benefits has focused on estimating the private consumption benefits derived by individuals attending professional sporting events. The current study differs from previous research in two aspects. First, the focus of this study is on college instead of professional sports. The difference between college and professional sports can be seen in the business structure of these organizations. College athletic departments are structured as non-profit institutions whose stated purpose is to integrate athletics in the student-athlete's educational experience (ncaa.org). However, professional sport teams are structured as profit-centered businesses that are owned by investors whose primary concern is the bottom-line (Kahn, 2007). Howard and Crompton (2004) indicate that the majority of NCAA Division I athletic departments' total expenses are greater than their total revenue, resulting in the dependence on institutional support to balance their budgets. Providing an estimate of private consumption benefits derived by individuals attending university athletic events can assist universities and their athletic departments in supporting the utilization of public dollars (i.e., institutional support). Second, the value being estimated is the consumer surplus derived by individuals from the total experience of a leisure trip to a sporting event rather than just attendance at a game. Baade, Baumann, and Matheson (2008) indicate the majority of research on the economics of sports has concentrated on professional events while far less attention has been given to college athletics.

Purpose

The primary purpose of this study was to estimate the value of private consumption benefits derived by individuals from the college football game experience. In many parts of the southeastern U.S., collegiate sporting events are the only live athletic competitions available to

residents besides high school and other amateur sporting events. Rooney and Pillsbury (1992) state "Football and the South are virtually synonymous. Nowhere is the sport-place bond stronger" (p. 70). Gumprecht (2003) indicates college football games are not only the main source of civic pride for college towns, but they also provide significant economic stimulus to local economies. However, what makes college football games different from their professional counterpart is the fan's experience which is comprised of the on-field competition and all the activities prior to and following the game (Gumprecht, 2003; Rooney & Pillsbury, 1992).

As previously mentioned, this study differs from previous research on the private consumption benefits of sporting events in that its focus is on the total experience of leisure trip to attend a college football game. In this study, the good being valued is a leisure trip to a southeastern university for the home football game experience. The value being estimated is not limited to seating in the stands and watching the sport competition. Rather, the good being valued is the total experience of the trip to the university for the home football game, which includes: travel to and from the university, watching the sport competition, the tailgating experience, visiting old friends and relatives at other tailgating locations, walking around campus and the city's downtown area visiting nostalgic sites, and participating in pre- and post-game activities related to the football game day experience.

The three research questions guiding this study are 1) what is the value of private consumption benefits derived by individuals from the college football game experience?; 2) what is the value of private consumption benefits derived by state residents from the college football game experience?; and 3) what is the aggregate value of private consumption benefits derived by state residents from the college football game experience? Assessing the benefits of state residents is important because the university under investigation is a public institution. Determining the value state residents derive from the college football game experience would help justify financial support given to the athletic department from the institution and the potential use of public subsidies to assist with various athletic projects.

Methods

In order to address this call for more research on college athletics, a medium-sized university, who is a member of one of the six Bowl Championship Series conferences, was selected as the study area. This university is located in the southeastern part of the United States in a city with approximately 13,000 residents and a university enrollment of 17,500. During the 2008 football season, the university athletic department reported average attendance of approximately 78,000 individuals per home game.

Data Collection Procedures

Data collection for the study was conducted at five home football games at a southeastern university. An on-site sampling strategy was employed using a systematic sampling procedure with a random start. The procedure consisted of a research team member systematically collecting email addresses from individuals in parking areas throughout the university campus and surrounding areas, as well as outside the stadium. The parking areas sampled in the research study included paid and free parking areas. For research team members working in the parking areas, the procedure would begin by the research assistant approaching the first vehicle to enter the assigned parking area and introducing themselves, as well as the purpose of the study. The

research assistant would ask the driver of the vehicle to provide an email address so a link to an on-line questionnaire could be sent the Monday following the game. After the research assistant completed the interview, he/she moved in a clockwise direction and approached groups at every fourth parking space. For research team members working outside the stadium, the data collection procedure consisted of a research assistant approaching every fifth individual that crossed an imagery line and asking the individual to participate in the research study. Individuals willing to participate in the study were asked to provide an email address so a link to an on-line questionnaire could be sent the Monday following the game.

The survey implementation used a modified Dillman (2007) approach. The process began with sending an email with a link to the on-line questionnaire to individuals willing to participate in the study the Monday following the game. Two follow-up attempts were made two and four days after the initial email. After the third attempt, all participants not completing the questionnaire were excluded from the analysis. The short time period between the initial email and the follow up emails was due to the university football team's first four home games being on consecutive weekends. This process required the research participants to complete the questionnaire for the game they were intercepted at before they attended the next game. An additional benefit to the short time period was a reduction in recall bias.

The questionnaires sent to research participants from different games were exact replicas except for the opponent's name being changed. The survey instrument began with an introduction, which explained the purpose of the study, the organizations involved in the study, and provided assurance of confidentiality. The questionnaire included questions related to the participant's most recent trip to the southeastern university's home football game, trip expenditures, motivations, loyalty, and demographics. The main section of the questionnaire included a contingent valuation question which was used to estimate the private consumption benefits (i.e., use value) derived by individuals from the college football game experience.

Contingent Valuation Method

When estimating the use value (i.e., private consumption benefits) of a leisure experience, such as the college football game experience, two appropriate non-market valuation techniques have been identified: travel cost method (TCM) and contingent valuation method (CVM) (Bateman & Willis, 1999; Freeman, 2003; Loomis & Walsh, 1997). TCM and CVM are economic valuation models used to estimate a monetary value of goods and services typically not traded in the marketplace. TCM is a non-market valuation technique frequently employed to estimate the economic benefits obtained by individuals participating in outdoor recreation (Carson et al., 1996). TCM is a reveal preference method since respondent's actual trip expenditures are utilized in the analysis to derive a demand curve for estimating benefits (Loomis & Walsh, 1997). Since the model uses actual behavior to derive the demand curve, TCM can only be used to estimate the use value of a recreational or leisure experience (Parsons, 2003). On the other hand, CVM is a stated preference valuation method because individuals express how they would behave given a specific hypothetical situation, contingent upon it becoming reality. Many CVM studies utilize questions asking respondent's their willingness to pay (WTP) for the hypothetical situation to become true, resulting in an estimation of the non-market benefits (Freeman, 2003). Measuring WTP utilizing contingent valuation models, researchers can estimate use, non-use, and option values (Tietenberg, 2000).

In the current study, the contingent valuation method was identified as the most appropriate technique based on a pilot test and recommendations from other researchers. Freeman (2003) indicates TCM requires sufficient variation in the dependent variable in order to estimate a statistical demand function based on individual observations. In TCM, the dependent variable is the number of trips taken to the recreation site. The majority (72.5%) of tickets sold for the southeastern university home football games were season tickets. Results from a pilot test reveal 73% of respondents planned on attending six or seven home football games. With this evidence, the author discovered an insufficient amount of variation existed in the sample which would reduce the efficiency of the TCM. Additionally, Walker and Mondello (2007) suggest the contingent valuation method is a promising technique for measuring consumption benefits, as well as providing more flexibility than other nonmarket valuation approaches.

When employing CVM to estimate the value individuals derive from the college football game experience, several methodological considerations must be addressed. First, CVM requires the collection of primary data. Second, the method of payment presented to respondents in the CVM question may increase the likelihood of honest evaluations (Loomis & Walsh, 1997). A plethora of payment vehicles have been utilized in contingent valuation studies, such as entrance fees, license fees, user fees, utility bills, charitable donations, taxes, and increased trip costs (Mitchell & Carson, 1989). Loomis and Walsh (1997) indicate the most common payment vehicle used in contingent valuation studies to value a recreation trip is an increase in trip costs. Accordingly, an increase in trip costs was the method of payment selected for utilization in this study.

Finally, among the various types of contingent valuation question formats (e.g., open-ended format, dichotomous choice) the dichotomous choice format is the most widely used technique to elicit individual's WTP for recreation opportunities or resources (Alberini & Kahn, 2006). In the dichotomous choice format, respondents are asked to respond "yes" or "no" to a question regarding their willingness to pay for a recreation opportunity or resource. In this format, respondents are offered a price for a recreation opportunity or resource and must decide whether to "take it or leave it." Hoehn and Randall (1987) indicate dichotomous format questions produce incentives that induce truth telling. Although dichotomous questions do not provide a direct estimate of WTP, data gathered on the probabilities of individuals answering "yes" or "no" to proposed dollar values is utilized to estimate the derived benefits (Bishop & Heberlein, 1979).

When constructing a contingent valuation question, the first step is to describe the good (i.e., trip to southeastern university football game) being valued. The contingent valuation question began with an introductory paragraph that explain the characteristics of a trip to the university's football game which included: travel to and from the university, watching the sport competition, the tailgating experience, visiting old friends and relatives at other tailgating locations, walking around campus and the city's downtown area visiting nostalgic sites, and participating in pre- and post-game activities related to the football game day experience. After the good is described, the dichotomous choice contingent valuation question presented to respondents was: "If the cost of goods and services (e.g., gas, food, lodging, tailgating supplies, etc.) associated with a trip to a X University home football game were to increase, causing the trip to X for a football game to cost \$ _____ more than your most recent trip, would you still attend the X University home football game? (Assume your income level remains the same.)" Respondents were instructed to consider the trip costs they identified in the previous section when answering the CVM question. The expenditure question included the following spending

categories: retail, eating and drinking places, accommodations, game tickets, concessions, entertainment, recreational activities, auto, and other. Ten bid values ranging from \$10 to \$1000 were pre-selected and presented to respondents as random offers. That is, ten versions of the contingent valuation survey were developed with each version having a different bid value, and respondents were randomly assigned a version of the survey instrument. Bateman and Willis (1999) indicate one bid amount should be low enough that the majority of respondents will say yes, and one bid amount should be large enough so no individual would pay that amount. The bid values were selected based on a review of existing literature, conversations with numerous individuals familiar with taking trips to the southeastern university's home football games, and a pilot test.

Model Analysis Approach

Since the dichotomous choice contingent valuation question has a binary choice dependent variable, a logistic regression model is employed to determine the probability of individuals responding "yes" to the proposed bid amount and the estimation of coefficients used in the calculation of the WTP values.

Employing an indirect utility framework, utility is comprised of a systematic and random component, which is represented as:

$$U = V(D, M, S) + \varepsilon \quad (1)$$

where V is the deterministic component of utility, ε is the error component of utility, M is income, and S corresponds to individual socio-economic attributes. In addition, D represents the two options presented to the respondent, where 1 corresponds to the individual answering "yes" to the contingent valuation question and 0 corresponds to a "no" response. An individual visiting the university for a home football game will pay the proposed amount A (i.e., answer "yes") only if the utility gained from the trip is greater than utility from not taking the trip. In other words:

$$V(1, M - A; S) + \varepsilon_1 \geq V(0, M; S) + \varepsilon_0. \quad (2)$$

Since the random error component is unobservable, the researcher is restricted to only making WTP probabilities assertions about "yes" or "no" responses. Assuming the error components are independently and identically dispersed with a mean zero and variance $\pi^2 / 3$ (i.e., standard logistic distribution), the probability that a visitor to the university home football game answers "yes" is identified by:

$$\Pr(\text{yes} = 1) = \frac{1}{1 + e^{-(\alpha + \beta A + \gamma M + \theta S)}} \quad (3)$$

where α , β , γ , and θ are coefficients to be estimated.

Haab and McConnell (2002) indicate various explanatory variables should be included in the probability function in order to "gain information on the validity and reliability of the contingent valuation method, and to extrapolate sample responses to more general populations" (p. 23). Boyle (2003) suggests apparent candidates for inclusion include demographic variables,

such as income and age, and other variables that could affect the resultant willingness to pay. Therefore, several explanatory variables were integrated in the multivariate logistic regression model: proposed bid amount (Bid), age of respondent (Age), annual household income (Income), number of home football games attended during the 2008 football season (NumberofGames), and the distance from respondent's residency to the football stadium in minutes (TravelDistance). For the proposed bid amount, respondents were randomly given a bid amount that ranged between \$0 and \$1000. Respondents were asked to report their age, number of games attended, and travel distance in an open-ended format. Regarding the income question, respondents were asked to select a category that best represents their annual household income level.

Economic theory specifies as the price of a good or service increases, the less likely an individual is to continue to purchase that good or service, *ceteris paribus*. Therefore, as the bid amount increases, respondents should be less willing to purchase the trip to the university for a home football game. Haab and McConnell (2002) suggest a respondent's socio-economic characteristics are also anticipated to affect the individual's acceptance of the proposed bid amount. Normally, individuals that are older and have higher annual household incomes are more willing to pay higher trip costs.

After *Equation 3* is estimated using logistic regression, three methods can be utilized to compute the value of willingness to pay (Boyle, 2003). The three methods are: mean WTP, overall mean WTP, and truncated mean WTP. Duffield and Patterson (1991) suggest the truncated mean WTP method is preferable because the technique helps "reduce the influence of the upper end of the distribution but is still an expected value and therefore has a simple interpretation when aggregated over the whole population" (p. 227). Thus, the truncated mean WTP is used in this study.

Once the logit model in *Equation 3* is estimated using the maximum likelihood estimation method, a probability curve, in this case, the cumulative distribution function of the standard logistic variate, for "yes" and "no" responses is derived (see Sellar et al., 1986 for derivation). To determine the expected value of WTP, the area under the probability curve is calculated by numerical integration, ranging from 0 to the maximum bid amount (\$1000) as follows:

$$E(WTP) = \int_0^{MAX_A} F_{\eta} (dV(A))dA \quad (4)$$

$$= \int_0^{MAX_A} \left(\frac{1}{1 + e^{-dV(A)}} \right) dA = \int_0^{MAX_A} \left(\frac{1}{1 + e^{-(\alpha + \beta A + \gamma M + \delta S)}} \right) dA \quad (5)$$

where F_{η} is the cumulative distribution function of the standard logistic variate (see Hanneman, 1984, p. 334), $E(WTP)$ is the truncated mean WTP, and MAX_A is the maximum bid amount.

Numerical integration approximates the area of a curvilinear region by breaking the region into thin vertical slabs. In order to calculate WTP, the parameter estimates from the logistic regression equation and the associated mean value for each variable are entered into *Equation 5*. Using STATA statistical software to perform the integration, the area under the probability curve is estimated by partitioning the area into smaller areas based on the range of bid values. After the different areas under the probability curve are estimated, the values are

summed to provide an estimate of the total region under the probability curve, which is equivalent to net willingness to pay.

Since the scenario presented to survey respondents uses trip expenditures as the payment method, any additional trip costs incurred by the respondent would be distributed across the number of people the individual was financially responsible for. Following the method used by Fix and Loomis (1998), the estimate of private consumption benefits derived by individuals was divided by the number of people they were financially responsible for.

Results

A total of 1,886 email addresses were collected by the research team and 257 were non-deliverable. After deleting the non-deliverable email addresses, the effective response rate was 56.9%. Out of the 927 returned questionnaires, 158 were excluded from the contingent valuation analysis due to lack of response to survey questions used in the analysis. Therefore, results are based on a sample size of 769 with a corresponding response rate of 47.2%.

Analysis of these respondents indicates 59.7% were male and 39.9% were female with an average age of 38.4 years. The majority (72.4%) of respondents were college graduates with 22.9% of these respondents having a post graduate education. Approximately 56% of respondents reported having an annual household income of \$80,000 or higher. Ten percent of respondents were university students with the remaining 90% indicating being non-students. Approximately 82% of respondents were residents of the state where the university is located. The average drive time from the respondent's residence to the football stadium was 87.16 minutes and respondents reported attending 5.03 home games. Respondents reported an average party size of 7.72 people, but indicated being financially responsible for 2.29 individuals. Results revealed expenditures associated with a trip to the university for a football game were \$277.15 (or \$121.03 per person). The majority of expenditures were on game tickets (\$101.09), followed by auto (\$46.73), grocery stores and retail (\$43.07), and restaurants and drinking places (\$36.76).

For the contingent valuation question, an analysis is performed for both the total sample and the state resident sample. Table 1 presents descriptive statistics for the variables utilized in the estimation of the total sample model and state resident model. The average age of the state resident sample was 39.9 years old. Approximately 58% of state residents reported an annual household income over \$80,000. State residents attended 5.23 home football games, and traveled an average of 83 minutes from their residence to the football stadium.

Table 1. *Descriptive statistics variables used in contingent valuation analysis for the total sample and state residents models.*

	Total Sample	State Residents
Variables	Mean (S.D.)	Mean (S.D.)
Age	38.35 (13.21)	39.95 (12.62)
Income	4.69 (1.88)*	4.78 (1.72)*
Number of games	5.03 (2.24)	5.23 (2.12)
Travel distance	87.16 (92.31)	82.94 (74.94)

S.D. represents standard deviation.

* Based on a scale of 1 to 7.

These explanatory variables were integrated in to a multivariate logistic regression model. In order to provide a reference point for the logistic regression analysis, a reduced model, in addition to the total sample and South Carolina resident models, is provided. For the reduced model, the only variable included in the analysis is the Bid Amount variable. Results of the logistic regression analysis for the reduced, total sample, and state resident models are exhibited in Table 2. The explanatory power (or goodness-of-fit) of the reduced model has a McFadden's ρ^2 of 0.13 (McFadden's ρ^2 is similar to R^2 in a conventional regression analysis) (Greene, 2000). For the total sample and state resident sample, the explanatory power for both models was fairly high with a McFadden's ρ^2 of 0.17 for the total sample model and 0.19 for the state resident model. As can be seen from the results, the goodness-of-fit for the total sample and state resident models improve with the addition of explanatory variables.

Total Sample

In the total sample model, all variables are highly significant except Travel Distance, which was moderately significant (Table 2). As anticipated, the highly significant and negative coefficient on the Bid variable implies that respondents were less willing to pay (i.e., respond "Yes") as the proposed bid amount increased. The highly significant and negative coefficient on the Age variable suggests respondents were more likely to respond "No" to the contingent valuation question as their age increased. As expected, the highly significant positive coefficient on Income indicates respondents who reported higher household income levels were more likely to respond "Yes" to the contingent valuation question. Surprisingly, the highly significant and positive coefficient on the Number of Games variable implies respondents were more willing to pay (i.e., respond "Yes") as the number of games attended increased. Finally, the moderately significant and positive coefficient on the Travel Distance variable suggests respondents were more likely to respond "Yes" to the contingent valuation question as the number of minutes from their residence increased.

State Resident Sample

In the state resident sample model, all variables are highly significant except for Travel Distance, which was moderately significant (Table 2). As expected, the Bid variable coefficient

is highly significant and negative, indicating state residents visiting the university to participate in the home football game experience were more likely to respond “No” as the proposed bid amount increased. The highly significant and negative coefficient on the Age variable implies state residents visiting the university to participate in the home football game experience are less willing to pay (i.e., respond “Yes”) as their age increased. The Income variable was positive and highly significant suggesting as household income levels increased, state residents were more likely to respond “Yes” to the contingent valuation question. Unexpectedly, the highly significant and positive coefficient on the Number of Games variable indicates state residents were more willing to pay (i.e., respond “Yes”) as the number of games attended increased. Finally, the moderately significant and positive coefficient on the Travel Distance variable suggests respondents were more likely to response “Yes” to the contingent valuation question as the number of minutes from their residence increased.

Table 2. *Results of logistic regression for the reduced, total sample and State resident models.*

Variables	Reduced Model		Total Sample		State Resident	
	Coefficient ¹	Std. Error	Coefficient ¹	Std. Error	Coefficient ¹	Std. Error
Bid	-0.003 ^a	0.000	-0.003 ^a	0.000	-0.003 ^a	0.000
Age	--	--	-0.020 ^a	0.007	-0.020 ^b	0.009
Income	--	--	0.149 ^a	0.052	0.162 ^b	0.066
NumberGames	--	--	0.219 ^a	0.039	0.284 ^a	0.050
TravelDistance	--	--	0.002 ^c	0.001	0.001 ^c	0.001
Intercept	1.09	0.113	0.121	0.317	-0.297	0.413
McFadden ρ^2	.1311		0.1705		0.1892	

¹ Significance level of .01, .05, and .10 are represented by a, b, and c respectively.

Estimates of Private Consumption Benefits

Total Sample

In order to calculate private consumption benefits (i.e., consumer surplus or net willingness to pay), the estimated equations were numerically approximated over a range of values between zero and the maximum bid amount (\$1000). For the total sample model, estimated net willingness to pay (i.e., private consumption benefits) over trip expenditures was \$184.87 per game (Table 3). Therefore, when the estimates are recognized as net benefits accrued from the football game experience, in general, average individuals were willing to pay \$184.87 per game over trip expenditures (i.e., benefit gain worth \$184.87). Confidence intervals

for the willingness to pay estimate were calculated using the delta method. For a detailed explanation of the delta method see Greene (2003) and Hole (2007). The mean WTP and 95% confidence intervals for the total sample are displayed in Table 3.

Table 3. *Mean willingness to pay and 95% confidence intervals for total sample and state resident models.*

	Mean WTP	Std. Error	Lower Bound	Upper Bound
Total sample WTP	\$184.87	18.50	\$169.03	\$200.70
State resident WTP	\$168.80	20.95	\$151.83	\$185.78

State Resident Sample

For the state resident model, estimated net willingness to pay (i.e., private consumption benefits) over trip expenditures was \$168.80 per game (Table 3). Thus, when the values are understood as net benefits accrued from the football game experience, the average state resident participating in the university home football game experience was willing to pay \$168.80 per game over trip expenditures (i.e., benefit gain worth \$168.80). Again, confidence intervals for the willingness to pay estimate are calculated using the delta method. Table 3 presents the mean WTP and 95% confidence intervals for the state resident model.

Calculating the aggregate value of private consumption benefits derived by state residents visiting the university to participate in the home football game experience involved multiplying the total number of residents that attend games by individual net willingness to pay. During the 2008 home football schedule, 546,004 individuals attended home games. Multiplying total attendance by the percentage of survey respondents that were residents (81.9%), results in an estimate of 447,177 state residents. Multiplying the number of spectators that were state residents by the private consumption benefits derived by these individuals per game produced \$75,483,477 in economic benefits from the university home football game experience during the 2008 football season.

Discussion

The purpose of this research was to estimate the private consumption benefits derived by individuals visiting a southeastern university for the home football game experience. Results from the contingent valuation analysis revealed individuals visiting the southeastern university for the home football game experience derived a significant amount of benefits (i.e., consumer surplus). The analysis of the total sample indicates individuals derived \$184.87 per game in private consumption benefits for the home football game experience, while state residents derived \$168.80 per game. On average, respondents reported spending \$121 per person on their trip to the university's football game. These results suggest that individuals derived benefits in excess of their trip expenditures. Since the previous research estimating private consumption benefits of sporting event attendance has not measured these benefits on an individual basis, it is

difficult to compare these estimates to previous studies. However, Fix and Loomis (1998) estimated the economic value individuals' derived from a trip to the Moab, Utah for mountain biking. Results from the study indicated individuals derived \$235 in economic benefits from this trip experience. While some individuals may perceive an estimate of \$168 to be high, this estimate is much lower than benefits derived from other leisure trip experiences. An additional objective of this study was to determine whether the private consumption benefits derived by state residents from the college football game experience would justify the utilization of public resources on university athletics. Howard and Crompton (2004) indicate that 75% of Division I athletic programs lose money due to expenses outpacing revenues. These authors suggest a significant number of university athletic programs rely on institutional support in order to breakeven. Although the results of this study may not justify the utilization of public dollars on university athletics, university administrators could use the results of the study to support the use of public resources to assist athletic departments.

Swindell and Rosentraub (1998) assert individuals that attend sport events derive a higher level of consumption benefits than individuals that do not attend events. With this evidence, Swindell and Rosentraub proposed the financial burden of sport facility construction projects should be placed on direct users of the facility following the benefit principle. The benefit principle of taxation suggests "each taxpayer's financial contribution to the provision of a publicly provided service should be a function of the benefits received from that service" (Zimmerman, 1997, p. 120). If government decisions are based on the benefit principle of taxation, then decisions regarding the public financing of sports stadiums and arenas should concentrate on the private consumption benefits derived by residents. Basing decisions regarding the public financing of sports stadiums and arenas on the private consumption benefits derived by residents assigns more of the financial burden on direct users of the facilities. If the net value of the private consumption benefits derived by residents attending sporting events exceeds the costs of proposed construction projects, then the utilization of public funds to support these projects would be justified.

Management Applications

Estimating the private consumption benefits derived by individuals participating in the college football game experience provides several management applications. First, an estimate of private consumption benefits can be used to justify the utilization of public subsidies. When university athletic departments or professional sport franchises are considering construction projects, estimating the private consumption benefits derived by spectators is a valuable piece of information used to determine the total economic value of the sport team and/or facility (Barget & Gougnet, 2007).

Similarly, when governments are presented requests by university athletic departments and/or professional sport franchises for public subsidies, they can use an estimate of the private consumption benefits derived by residents attending games in the evaluation process. Using private consumption benefits provides a more conservative estimate when compared to the use of economic impact studies and estimates of public consumption benefits. Researchers have identified the numerous methodological flaws with economic impact studies, and how these studies usually overestimate the true impact of a sport team or facility (Seigfried & Zimbalist, 2000; Baade, 1996; Crompton, 1995). When estimating the public consumption benefits, researchers look at the benefits derived from all residents of the local area, regardless of whether

they attend games or not. In comparison, private consumption benefits focus on the benefits derived by individuals attending sport competitions. Swindell and Rosentraub (1998) imply the importance of assessing the private consumption benefits because “financing mechanisms should place more burden of paying for an asset on those who attend than on the general public” (p. 16).

Estimating the private consumption benefits derived by spectators also provide sport team administrators with an estimate of spectators’ willingness to pay. University athletic departments and professional sport franchises can use these estimates in decisions regarding price increases or the effect of a price increase on demand. If results indicate spectators derive a significant level of private consumption benefits, then sport team administrators can use the results to justify a price increase. However, sport team administrators should not use these results in isolation when making decision about price increases, but should also consider other pertinent information.

Coughlin and Erekson (1984) provide another use of an estimate of private consumption benefits. These researchers imply private consumption benefits derived from attendance at sporting events is “a key source for athletic contributions” (p. 182). Coughlin and Erekson (1984) purport a measure of private consumption benefits provides an estimate of the potential donations available to athletic departments.

This study also provides an estimate of the value individuals place on the experience of a trip to a southeastern university’s home football game. Before this study, no research had been performed to estimate the value individuals derive from a recreational trip to attend a sport competition. Results indicate individuals derive a significant amount of benefits from the experience of a trip to a university home football game. This study demonstrates the importance of sport competitions as a leisure activity for many individuals.

Finally, this study adds to the limited research on the economic contributions of college athletics. Most of the previous research on the economic evaluation of sports has focused on professional sport franchises. As college athletics continues to expand, new research streams and new techniques will be required to properly evaluate the total economic value of college athletics.

Conclusion

Evaluating the private consumption benefits of sport teams and facilities has been identified as an important value that requires attention (Alexander et al., 2000; Irani, 1997). The issue is very little research has been conducted to measure or estimate these other economic contributions. With minimal research focusing on the estimation of private consumption benefits, the goal of this research was to expand the base of knowledge in the economic valuation of sporting events.

As with most research, a limitation of the study should be addressed. The main criticism of contingent valuation studies is hypothetical bias. Previous researchers suggest that asking hypothetical questions result in a hypothetical answer. However, Bateman and Willis (1999) indicate much of the criticism about the hypothetical bias of contingent valuation studies is focused on the measurement of non-use values. They note “CV practitioners...have confidence that responses to hypothetical questions will approximate behavior when money is actually exchanged” (p. 185). Empirical applications evaluating the criterion validity of contingent valuation studies that estimate the use value (i.e., private consumption benefits) of a good or service support these proclamations (Kealy et al., 1988; Dickie et al., 1987; Bishop et al., 1983).

Therefore, the use of the CVM to estimate the use value of goods and services receive less criticism than those estimating the non-use value.

Finally, several areas for future research arise from this research. First, more research is needed on the economic contributions of college athletics on local communities. Most of the existing literature on the economic contributions of sports has concentrated on professional sports.

Second, the contingent valuation method should be utilized to estimate the private consumption benefits of various types of university football games and other university sports, as well as professional sporting events. Similarly, CVM could be used at various types of amateur sporting events to determine individuals' willingness to pay for these events. This would provide a value of the benefits received from sport competition attendance, and may assist supporters of these events in obtaining public funds. Additionally, event organizers could use the information to determine the feasibility of charging an admission fee or price increases.

An additional future research recommendation is measuring the private consumption benefits derived by various groups attending sporting events. In the college athletics domain, an interesting question would be whether individuals in college booster clubs derive a higher level of private consumption benefits compared to individuals not involved in these associations. Individuals involved in these booster clubs pay a premium to be associated with the club and for better seat and parking assignments. In the professional and college domain, another interesting question would be whether individuals with varying degrees of fan loyalty derive different levels of private consumption benefits.

The majority of research performed to assess the economic contributions of sport teams has focused on professional franchises (Seigfried & Zimbalist, 2002). However, Baade, Baumann, and Matheson (2008) emphasized the dearth of academic research investigating the economic contributions of college athletics. As college athletics continues to grow in popularity, the economic contributions of these institutions for the cities where they reside will also increase. Providing athletic administrators, local governments, and tourism stakeholders with an estimate of the economic value individuals derived from the college football game experience will assist these decision-makers in the evaluation process of short- and long-term policies.

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