Willingness to pay to host the Summer Olympic Games[1]

Dennis Coates

Department of Economics

UMBC

Baltimore, MD USA

and

HSE International Lab on Intangible-driven economy

Perm, Russia

Stefan Szymanski

Department of Kinesiology

University of Michigan

Ann Arbor, MI USA

[1] The following Michigan students worked on the structure and implementation of the questionnaire: Michael Adsit, Zachary Amateau, Brandon Azus, David Carlson, Michael Chiasson, Hannah Cohen, Nathan Gilchrist, Kenza Guessous, Nicholas Houser, Jared Hunter, Brooke Kranz, Alexander Locke, Travis Lynch, Andrew Purugganan, Charles Roarty, Isaac Rosner, Andrew Sinelli, Jennifer Stein, Philip Tafet, Zachary Verch. We thank participants of the iCare2 conference in Perm, Russia, September 23, 2014 for comments and suggestions

In 2013 the United States Olympic Committee (USOC) announced that it would consider supporting a bid host the 2024. It is widely suggested that the US will be well placed to host the games in that year. The games are awarded by the International Olympic Committee (IOC) and the USOC recently settled a long standing dispute over the allocation of Olympic revenues which had clouded Chicago's 2016 bid for the games. By 2024 it will be 28 years since the games were held in North America, and following games in Tokyo, Rio and London there is a sense that it is North America's turn. In June 2014 the USOC announced that four cities have been shortlisted – Boston, Los Angeles, San Francisco and Washington.

There is substantial agreement among academic economists that the case for hosting mega-events is a weak one. Baade and Matheson (2004) evaluated the FIFA World Cup held in the United States in 1994 and found that "host cities experienced cumulative losses of $5.5 to $9.3 billion as opposed to the ex ante estimates of a $4 billion gain touted by boosters." Porter and Fletcher (2008) examined the impact of the Winter Olympic Games on Salt Lake City, Utah. They found little evidence of a boost in economic activity, but did find a large spike in the cost of renting a hotel room. Porter and Chin (2012) review the literature on the economic impact of events. They report that between 2000 and 2010, more than 40 articles looking for an impact of sports events or teams appeared in academic journals. "Without exception, these authors found no consistent positive impact from a sporting event, often finding the event associated with a negative impact." With this information as backdrop, one has to wonder why cities and countries are often eager to bid to host the Olympics or the World Cup.

Of course, one explanation is that citizens may not have this information. That seems unlikely in this age of rapid information transmission around the world. More probably,

significant numbers of people support the bids because hosting the event brings prestige to their city or country, because hosting the event may provide leverage for other needed infrastructure projects, or simply because they are sports fans. For supporters, it is likely that the costs they personally incur and even those that their country will bear are smaller than the benefits of hosting the event.

Whatever the motivation of the local population, it is clear that an important aspect of winning a bid to host the games is public support. For example, many felt that the failure of Tokyo's bid in 2016 was the result of a limited degree of public enthusiasm, and public opinion seemed much more strongly supportive of the eventually successful 2020 bid. Similarly, Munich likely lost its bid to host the 2018 Winter Olympics because of opposition based on ecological grounds, despite a favorable referendum outcome in one potential host jurisdiction just two months before the IOC vote. (Mackay, 2013**)** In fact, there were at least four referenda with regard to bidding to host the 2022 Winter Olympics, in Krakow, Poland, Oslo, Norway, Munich, Germany, and St. Moritz/Davos, Switzerland. Only the Oslo referendum passed. In each of these recent referendums, an important issue has been the enormous expense of hosting the Games, especially in light of the reports that the Russian Federation spent $50 billion to put on the Sochi Winter Olympic Games. (Zurawski, 2014; Mackay, 2014). Given these concerns about the cost of hosting the Games, this paper focuses on opinions expressed by a sample of Americans about hosting the Summer Olympic Games. The purpose is to more fully understand people's valuation of hosting the Olympics.

The analysis here addresses two questions about citizen interest in hosting the Summer Olympics. Effective demand is based on willingness and ability to pay. Our first question is how much are US residents willing and able to pay to host the Olympics in their region.

Relatedly, we assess the determinants of that willingness and ability to pay. For example, it is natural to think that households with higher incomes will be willing to pay more to host the event than households with low incomes. This simply means that hosting the event is a normal good. It is also possible that households from different regions of the country or from potential host cities are willing to pay more to host the event. Our analysis explains the stated willingness to pay using a variety of personal characteristics and alternative empirical strategies. We formalize our model below.

Being willing to pay to host the event in one's region does not necessarily mean that one plans to attend it. Our second question addresses the issue of willingness to travel to the event location. People who value the event more will, all other things constant, be willing to travel farther to witness the games in person than individuals who place less, or no, value on the event. By contrast, someone who is unwilling to pay to host the event may, nonetheless, value it sufficiently to travel some distance to attend it. We estimate a travel distance model to assess the determinants of this value, and hence the value of attendance at the Olympics.

Finally, related to the question of willingness to travel to attend the Summer Olympics is the question of which location or event individuals would choose from a set of possibilities. Among the possibilities is the Summer Olympics, with no location specified, as well as Las Vegas, Nevada, Washington, DC, and Disneyland. Our analysis addresses the determinants of the stated choice from among these four possibilities using a multinomial logit framework.

A novel aspect of this research is the use of data collected via an online survey in which survey respondents are paid to complete the survey. The survey is implemented as a task to be completed at the online employment sight known as Mechanical Turk operated by Amazon.com. At Mechanical Turk, employers submit tasks that involve data manipulation and the salary for

doing so. Payments are completed electronically upon completion of the task. Typical tasks listed on the sight include writing computer code and transcription or translation of documents. Completion of a survey is also a common task. Mechanical Turk is an inexpensive way to implement a survey since Turkers are often willing to work for a very small fee.

The use of Mechanical Turk in surveys and other social science research has generated some interest in recent years and there is now a substantial literature on the subject. Goodman et al (2013) survey a number of uses of Mechanical Turk and find that, while not without its drawbacks, the responses of employees are generally reliable. One obvious concern is the representativeness of the sample. Ipeirotis studied the profiles of people who commonly undertook Mechanical Turk tasks and found that it was not restricted to low income individuals, and that many people took part in a task out of interest as much as for the money. Of course, survey participants who participate out of greater interest than non-participants indicates non-randomness in the sample, an issue which we will discuss in relation to our results.

The survey on which this research is based was conducted in the first three weeks of April 2014 by a group of University of Michigan students as a class project. The students offered 10 cents to anyone willing to complete the ten question survey, and received 1807 responses. The questionnaire required all respondents to have a US IP address, the questionnaire can be found at the end of the paper.

Data

The survey produced a total of 1807 responses though a handful did not provide answers for all of the questions. Observations with missing or inappropriate values for any of the

variables are dropped leaving 1768 observations in the sample. Table 1 reports descriptive statistics for variables used in the analysis. Respondents reported their race, gender, and age. The typical respondent is white (75%), male (66%) and in his twenties. Finalist indicates that about 10% of the respondents are from one of the four cities (Boston, Washington, San Francisco, and Los Angeles) still in the running to be the US bidder for the 2024 Summer Olympics.

Survey respondents reported their zip code which was used to categorize the observations by states and regions. All 50 states and the District of Columbia are represented, with two respondents each from Wyoming and North Dakota, 227 from California and more than 100 from each of New York, Florida, and Texas. Table 1 reports the proportion of the sample that stated a home location in each of the nine census districts.

Survey respondents were asked about willingness to spend, willingness to drive, and household income in ranges. In Table 1, willingness to spend and to drive are reported for the full sample, but Table 2 reports the means and medians by each of the nine census regions. Tables 3 through 5 provide information on the stated willingness to pay to host the Olympics, the stated willingness to drive to attend the Olympics, and reported household income. Thirty-nine percent of our sample reported a willingness to pay of zero. By contrast, Wicker, et al (2012) surveyed randomly selected individuals via telephone about their willingness to pay for Germany to win the most gold medals at the Olympics; 63.4% reported a value of zero. Using online surveys conducted by *TNS Enmid*, one of Germany's leading survey research institutes, Sussmuth, Heyne, and Maennig (2010) obtained a value of zero as the median willingness to pay of Germans to host the 2006 FIFA World Cup. Our much smaller proportion of zero responses to the willingness to pay question may be because of the nature of the questions or may indicate

a bias in our sample toward large reported willingness to pay. For example, it may be that 10 cents was sufficient compensation for completing the survey for individuals with greater than average willingness to pay to host the Olympics but insufficient to entice those with smaller than average willingness to pay. For this and other reasons, it is best to consider the reported willingness to pay here as an upper bound to the true willingness to pay.

Analysis is done using these variables in their discrete form as well as in versions of them made continuous. The variables were made continuous by using the midpoint of the reported range except when the respondent indicated the top coded value. For example, the highest income option in the survey is more than $100,000, selected by 8.82% of those surveyed. For these observations, reported income was set to $120,000. Likewise, for willingness to spend the top code, reported by 1.92% of the respondents, was more than $1000. In the continuous version of willingness to spend, the top value was set to $1100. At the other extreme, 39% of the respondents stated that they were unwilling to pay anything to bring the Olympics to the United States.[23] Just over 7% of the sample indicated the maximum driving time, top-coded at 24 hours or more; for the continuous variable the value was set to 30 hours.

Table 6 shows the distribution of destination choices among the four possibilities allowed in the survey. Note that the Summer Olympics is an event without a destination. For this option to be selected, the respondent is indicating that the Summer Olympics is a more attractive destination than are Disneyland, Las Vegas, or the nation's capital, no matter where in the

---

[2] The mean reported willingness to spend in Table 1 results from finding the average of the continuous values. Alternatively to treating each observation equally, the spending values could be weighted by the proportion of the sample providing that response. In that case the mean of reported willingness to spend is $130.83.

[3] This large share of zeros indicates that a Tobit analysis may be necessary to avoid bias in the estimation of the willingness to spend equation. The ordered nature of the variable also allows for estimation using ordered probit.

country it is held. One explanation for this response is that the Summer Olympics is only held once every four years, and has been in the United States only twice in the last thirty years. Having the Games on American soil is not quite a once-in-a-lifetime event, but it is certainly a once in a generation occurrence. This rarity may make an undetermined Summer Olympic location more interesting for many people than places that are available any time. It is also interesting that so few people, only about 16% of the sample, selected Washington, D.C. as their destination of choice. Both "playground" destinations, Disneyland and Las Vegas, were the choice of about 30% of the respondents, nearly double the percentage of respondents choosing the myriad of historical, educational and cultural treasures available in Washington.

Modelling Willingness to Pay and Willingness to Travel

Formalizing the model of willingness to pay to host the Olympics, the individual consumer has an expenditure function E(y, p, u, h), where y is household income, p is a vector of prices, u is the individual's level of utility, and h is an indicator variable equal to 1 if the country hosts the Olympics and 0 otherwise. This expenditure function has the normal properties of an expenditure function. (Deaton and Muellbauer, 1980) The consumer i's willingness to pay to host the Olympics is given by the difference in the expenditure function values when h=1 and h=0, while y, p and u are all unchanged:

This formulation shows that an individual's willingness to pay is a function of their income, prices of the goods and services they buy, including the taxes they pay for public services, and their preferences. It is important to note that willingness to pay may be negative if, for example,

the individual detests the idea of hosting the Olympics. For such a person, to achieve the same utility with hosting the Games as without, he or she will have to purchase more of other goods and services than previously. Of course, the only way to do this would be with compensation, a negative willingness to pay. For this individual, w_i is the willingness to accept. This is important to keep in mind because the survey did not allow respondents to report a negative willingness to pay.

Linearizing the model and introducing a stochastic term produces an estimable equation:

Where α and the β_j are parameters to be estimated, x_{ij} correspond to the income, prices, and consumer preferences in the expenditure and indirect utility functions, and ε_i is an identically and independently distributed random variable with mean 0 and constant variance. The β_j in this equation are the marginal willingness to pay to host the Summer Olympics of a change in variable $x_{.j}$. That 37% of the reported values of w_i are zero suggests that a Tobit technique be used to estimate the model. Our analysis includes both an OLS and a Tobit estimation of the willingness to spend equation.

The reliability of the estimates from equation (1) depend on the accuracy of the continuous representation of the true willingness to spend as reported in the discrete survey responses. Fortunately, the ordered nature of the dependent variable allows estimation of an ordered probit or ordered logit model of reported willingness to pay. For this model, let willingness to pay be represented by equation (1) as before. However, this is the actual willingness to pay and is unobserved, w_i^0 because the survey respondent reports only one of the 7

ranges indicated in Table 2. The respondent reports the first category, no willingness to spend, if actual willingness to spend is at or below some threshold value μ_1, which may be 0 but also may be negative or positive:

So,

The respondent will report the second category of willingness to spend if:

or (3)

Similarly, each reported spending category through the penultimate one, defines a new threshold parameter. For willingness to spend at the highest category, in this case $W_i=7$, the consumer reports willingness to spend at the highest category if

or (4)

The same models are estimated for the reported willingness to drive to attend the Olympics.

Results

Tables 7 through 10 report estimates of the willingness to pay and willingness to drive equations. The results for either are consistent across alternative specifications, OLS, Tobit or Ordered probit. Variables that are statistically significant in one approach are generally also in the other approaches and with the same direction of impact. Only the Mountain states census region variable breaks this pattern in the willingness to spend equation, being significant at the 10% level in the OLS specification. For willingness to drive, two variables are statistically insignificant in the OLS model but become significant in the other specifications of the willingness to drive equation.

The results in Table 7 show that income, particularly high income, is a strong determinant of both willingness to pay for the United States to become host of the Summer Olympics and of the willingness to drive to attend the Games. For example, all other things constant, an individual in the second income category, whose income falls in the range $30,000 to $60,000 annually, is willing to pay $49.64 more than an individual in the lowest income category to attract the Games to the US. The coefficients on the three income variables rise with income, indicating that the wealthier one is the more they are willing to pay. The effect of income on willingness to pay also appears to be highly nonlinear; from income less than $30 to income between $30 and 60 thousand, willingness to pay rises by $49.64 but moving from between $30 and $60 up to between $60 thousand and $100 thousand willingness to pay jumps less than $5. Then when income moves to $100 thousand or more, willingness to spend increases by $48.

The effects of income on driving are also interesting. Individuals in the second income group, those with incomes between $30 and $60 thousand a year, express no more willingness to drive to the Games than do the poorest individuals in the survey. However, those with incomes between $60 and $100 thousand are willing to drive nearly two more hours than the less wealthy,

and the wealthiest group, with incomes at or above $100 thousand a year are willing to drive three and a half hours to attend the Summer Olympic Games.

In the OLS results of Table 7, whites and females are both less willing to spend to ensure the US hosts the Summer Olympics than are other survey respondents while they are no different than others in terms of willingness to drive to attend the Games. Whites are willing to spend $45.44 less than non-whites; females are willing to spend $18.59 less than males.

Interestingly, age, in natural logarithms, has a negative coefficient in both equations in Table 7 but neither is statistically significant at conventional levels. Likewise, being from one of the finalist cities, San Francisco, Los Angeles, Boston, and Washington, has no impact on willingness to pay or to drive. Individuals from the Mountain states census region express a lower willingness to pay, of nearly $31, to host the Games than do residents of any other region; those from the East North Central (Ohio, Michigan, Wisconsin, Indiana, and Illinois) and West North Central (Nebraska, Iowa, North and South Dakota, Kansas, Missouri and Minnesota) states report a greater willingness to drive to attend the Summer Olympics. Those from the former are willing to drive about an hour and ten minutes more and people from the latter region two hours and 25 minutes more than others.

Table 8 presents the results of estimating the willingness to spend and willingness to drive equations using Tobit with both upper and lower bounds. As shown in the table, more than a third of the observations are left censored in the willingness to spend; in other words, fewer than two thirds of the survey respondents expressed a willingness to spend greater than zero. The OLS results for the spending equation of Table 7 are, therefore, likely biased and inconsistent. Only 34 observations, less than 2% of the observations, expressed a willingness to spend of more than $1000 suggesting right censoring may not be a problem. Fifteen percent

reported being unwilling to drive at all to see the Summer Olympics while 7% reported a willingness to drive 24 or more hours.

As suggested above, the results from the censored models are quite similar to the OLS findings. White, Male, and the three income categories are all individually significant with only Male (p=0.06) not being so at the 1% level. Each of the coefficient estimates indicates a stronger effect once the censoring is accounted for. In this model, white respondents report willingness to spend that is $71.86 less than the reported willingness of non-whites. Females are $30.46 less willing to spend to host the Summer Olympics than are males. Higher income individuals are willing to spend substantially more than poorer individuals to assure their region of the US hosts the Summer Olympics. The jump from those with incomes under $30 thousand to those in the $30 to $60 thousand range is over $81, but between the $30 to $60 thousand range and the $60 to $100 thousand dollar range, the boost in willingness to spend is only $7.50. Those with reported income over $100 thousand report a willingness to spend on attracting the Olympics of $160.25, 80% more than individuals whose income tops out at $100 thousand.

Male and the income categories are all individually significant at the 5% level or better in the willingness to drive equation. Males report being willing to drive 50 minutes more than females to attend the Summer Olympics. The second income group is willing to drive about an hour longer to attend the Olympics than are the poorest group of survey respondents. Individuals earning from $60 to $100 thousand a year are willing to drive about two hours and ten minutes longer than people earning less than $30 thousand a year, and those with incomes over $100 thousand a year report being willing to drive three hours and 55 minutes to attend the Summer Games. Finally, note that those from the East North Central and West North Central census

regions are, as in the OLS results, willing to drive statistically significantly (at the 10% level) more time to go to the Summer Olympic Games.

Finally, Tables 9 and 10 present results from estimating ordered probit models of the survey responses. In the OLS and Tobit/censored regressions, the dependent variables were made continuous from the discrete responses provided in Tables 2 and 3. In the ordered probit models, the dependent variable is the category of spending or driving the survey respondent indicated. The results are, again, consistent with those of the OLS and the Tobit models. White, Male, and the three income categories are individually statistically significant, though as before Male is only significant at the 10% level. The pattern in the coefficients on the income categories is as it was above. In the driving equation, Male and the income categories are all individually significant at the 5% level or better, with only Male not significant at the 1% level or better. In the ordered probit equation, West North Central is statistically significant but East North Central is not.

The threshold parameters are reported in Table 10. The most interesting aspect of these coefficients is the first threshold value. In both spending and driving equations, there are negative estimated thresholds below which a respondent will state zero willingness to expend resources for the Summer Olympics. Indeed, in the driving equation the 95% confidence interval on threshold one is entirely negative values. In both cases, these estimated thresholds suggest that some respondents reported zero willingness to spend or to drive when in fact their willingness was negative. Such individuals are not made better off but rather are made worse off if the US hosts the Olympics and would leave the host city to avoid the Games.

Discussion and Conclusions

A natural question is how much the reported willingness to spend to win the Summer Olympics implies for the entire country. Using the mean of the reported willingness to spend ($138.27) and multiplying that by the estimated population of the country (317 million) and the proportion over 18 years of age, the result is a national willingness to spend to host the Summer Olympics of $33.62 billion.[4] This seems a surprisingly high number, although recent Olympic games have become extremely expensive (estimates for the Beijing 2008 games as high as $40 billion have been suggested, while the Winter 2014 games in Sochi were said to have cost a staggering $60 billion).

First, we have already noted the likely upward bias in our sample due to self-selection into the survey. Second, it must be noted that the survey asked how much the respondent would be willing to pay for the Olympics to be held in his or her region. Consequently, it is probable that the value reported above is too large for a second reason, individuals may not be willing to pay so much if the Games will be in another region of the country. Table 11 shows the total willingness to pay by region, based on the population aged 18 to 65 and the mean reported willingness to pay in each region. The greatest any region would be willing to pay is $5.9 billion, in the South Atlantic area. That is far too small a sum to cover the costs of recent Olympic Games. Of course, the US, with its substantial base of established sports and transport infrastructure, could reasonably expect to be able to host the games for well below what recent hosts have had to spend.

Sceptics might also argue that stated willingness to pay in a survey and actual willingness to part with the dollars if required are quite different things. In other words, there may be

[4] The value is $31.81 billion with the alternatively calculated mean willingness to spend.

substantial “hypothetical bias” which makes the true willingness to pay substantially lower than reported here. In addition, the ordered probit results suggest that individuals whose true willingness to pay is negative are forced by the format of the question to report a non-negative value of their willingness to pay. Nonetheless, our results suggest that there is significant enthusiasm to host the Summer Olympic Games in the United States. What remains doubtful is whether that willingness to pay exceeds the cost of hosting the Games.

References

Atkinson, G., S. Mourato, S. Szymanski, and E. Ozdemiroglu. (2008) "Are We Willing to Pay Enough to 'Back the Bid'?:Valuing the Intangible Impacts of London's Bid to Host the 2012 Summer Olympic Games." Urban Studies, 45(2):419-444.

Baade, Robert A. and Victor A. Matheson. 2004. "The Quest for the Cup: Assessing the Economic Impact of the World Cup", *Regional Studies*, June 2004, v. 38, iss. 4, pp. 343-54.

Deaton, A. and J. Muellbauer. (1980) *Economics and consumer behavior*. Cambridge University Press.

Goodman, J. K., Cryder, C. E., & Cheema, A. (2013). Data collection in a flat world: The strengths and weaknesses of Mechanical Turk samples. *Journal of Behavioral Decision Making*, *26*(3), 213-224.

Humphreys, B. R., B.K. Johnson, D.S. Mason, and J. C. Whitehead. (201x) "Estimating the Value of Medal Success in the Olympic Games," Working Paper.

Ipeirotis, P. G. (2010). Demographics of mechanical turk. CeDER working paper

Mackay, Duncan. (2013) "Munich sets date for referendum on whether to bid for 2022 Winter Olympics and Paralympics," *inside the games*. http://www.insidethegames.biz/olympics/winter-olympics/2022/1014547-munich-sets-date-for-referendum-on-whether-to-bid-for-2022-winter-olympics-and-paralympics Last accessed 24/07/2014.

Mackay, Duncan. (2014) "It is important we convince Norwegians that Oslo 2022 will not be like Sochi 2014, admits chief executive," *inside the games*. http://www.insidethegames.biz/olympics/winter-olympics/2022/1021147-it-is-important-we-convince-norwegians-that-oslo-2022-will-not-be-like-sochi-2014-admits-chief-executive. Last accessed 24/07/2014.

Porter, Philip K. and Daniel M. Chin. (2012). "Economic Impact of Sports Events," in *International Handbook on the Economics of Mega Sporting Events*, Wolfgang Maennig and Andrew Zimbalist, eds. Edward Elgar: Northampton, Massachusetts.

Porter**,** Philip K. and Deborah Fletcher. 2008. "The Economic Impact of the Olympic Games: Ex Ante Predictions and Ex Post Reality," *Journal of Sport Management*, 22(4):470-486.

Sussmuth, Bernd, Malte Heyne and Wolfgang Maennig. (2010). "Induced Civic Pride and Integration," Oxford Bulletin of Economics and Statistics, 72(2):202-220.

Wicker, Pamela, Kirsten Hallmann, Christoph Breuer and Svenja Feiler. (2012). "The value of Olympic success and the Intangible effects of sports events – a contingent valuation approach Germany," European Sport Management Quarterly, 12(4):337-355.

Zurawski, Wojciech. (2014). "UPDATE 2-Olympics-Krakow drops Olympic bid following referendum," Reuters, May 26, 2014. http://www.reuters.com/article/2014/05/26/olympics-krakow-referendum-idUSL6N0OC1K820140526. Last accessed 24/07/2014.

Table 1: Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max
Reported willingness to spend	138.27	213.67	0	1100
Reported willingness to drive	6.46	7.97	0	30
Household income	47812.32	32626.22	15000	120000
Caucasian	0.75	0.43	0	1
Male	0.63	0.48	0	1
Age	29.81	9.58	18	79
Finalist	0.11	0.31	0	1
Mid Atlantic	0.14	0.34	0	1
New England	0.05	0.22	0	1
South Atlantic	0.20	0.40	0	1
East South Central	0.06	0.23	0	1
West South Central	0.09	0.28	0	1
Mountain	0.07	0.26	0	1
East North Central	0.15	0.36	0	1
West North Central	0.06	0.23	0	1
Pacific	0.19	0.39	0	1

N=1769

Table 2: Mean and Median Willingness to Spend and Drive by Region

	Obs	Mean	Std. Dev.	Median
		Mid Atlantic		
Reported willingness to spend	245	151.429	240.321	100
Reported willingness to drive	245	6.155	7.802	4
		New England		
Reported willingness to spend	86	127.907	189.520	100
Reported willingness to drive	86	5.256	7.591	4
		South Atlantic		
Reported willingness to spend	349	151.576	244.077	100
Reported willingness to drive	349	6.381	8.227	4
		East South Central		
Reported willingness to spend	103	129.126	187.152	100
Reported willingness to drive	103	6.748	8.019	4
		West South Central		
Reported willingness to spend	152	148.026	213.135	100
Reported willingness to drive	152	6.862	8.682	4
		Mountain		
Reported willingness to spend	124	93.548	124.771	100
Reported willingness to drive	124	5.895	6.576	4
		East North Central		
Reported willingness to spend	273	129.670	208.898	100
Reported willingness to drive	273	7.044	8.299	4
		West North Central		
Reported willingness to spend	103	127.185	203.977	100
Reported willingness to drive	103	8.408	8.680	4
		Pacific		
Reported willingness to spend	333	141.441	204.233	100
Reported willingness to drive	333	5.886	7.418	4

Table 3: Reported willingness to pay

	Freq.	Percent	Cum.
$0	691	39.06	39.06
$1-200	727	41.1	80.16
$201-400	180	10.18	90.34
$401-600	93	5.26	95.6
$601-800	28	1.58	97.18
$801-1000	16	0.9	98.08
More$1000	34	1.92	100

Table 4: Reported willingness to drive

	Freq.	Percent	Cum.
None at all	273	15.43	15.43
0-2 driving hours	378	21.37	36.8
2-6 driving hours	528	29.85	66.65
6-12 driving hours	354	20.01	86.66
12-24 driving hours	111	6.27	92.93
24+ driving hours	125	7.07	100

Table 5: Reported income

	Freq.	Percent	Cum.
$0-$30,000	643	36.35	36.35
$30,000-$60,000	611	34.54	70.89
$60,000-$100,000	359	20.29	91.18
More than $100,000	156	8.82	100

Table 6: Destination choices

	Freq.	Percent	Cum.
Disneyland	536	30.33	30.33
Las Vegas	526	29.77	60.10
Washington, DC	282	15.96	76.06
Summer Olympics	423	23.93	100

Table 7: Spending and Driving - OLS

	Spending			Driving		
	Coeff.	Std.Err.	p-value	Coeff.	Std.Err.	p-value
White	-45.440	13.349	0.001	0.042	0.456	0.926
Male	18.590	10.163	0.068	0.569	0.394	0.149
Income 2	49.643	11.192	0.000	0.685	0.425	0.107
Income 3	54.128	13.717	0.000	1.926	0.557	0.001
Income 4	102.284	23.252	0.000	3.508	0.799	0.000
Log Age	-13.298	18.101	0.463	-0.944	0.676	0.163
Finalist	4.183	19.214	0.828	-0.500	0.698	0.474
Mid Atlantic	19.325	19.722	0.327	0.043	0.702	0.951
New England	-1.131	23.205	0.961	-0.632	0.914	0.489
South Atlantic	20.737	17.234	0.229	0.453	0.635	0.476
East South Central	14.718	21.987	0.503	1.119	0.930	0.229
West South Central	19.373	20.644	0.348	0.951	0.859	0.268
Mountain	-30.972	16.431	0.060	0.061	0.762	0.936
East North Central	8.357	17.312	0.629	1.175	0.698	0.092
West North Central	3.746	22.852	0.870	2.404	0.977	0.014
Constant	159.057	61.234	0.009	7.814	2.304	0.001
R-squared	0.037			0.026		
N=	1769			1769		

Table 8: Spending and Driving - Tobit Censored above and below

	Spending			Driving		
	Coeff.	Std.Err.	p-value	Coeff.	Std.Err.	p-value
White	-71.864	18.121	0.000	0.007	0.479	0.989
Male	30.455	16.178	0.060	0.845	0.422	0.045
Income 2	81.182	18.547	0.000	0.969	0.482	0.045
Income 3	88.659	21.587	0.000	2.170	0.564	0.000
Income 4	160.254	28.700	0.000	3.916	0.762	0.000
Log Age	-26.930	27.857	0.334	-0.826	0.728	0.257
Finalist	5.436	27.981	0.846	-0.356	0.742	0.631
Mid Atlantic	11.191	29.078	0.700	0.184	0.765	0.810
New England	-1.172	38.715	0.976	-1.062	1.030	0.302
South Atlantic	11.006	25.756	0.669	0.395	0.679	0.560
East South Central	25.279	37.926	0.505	0.994	1.003	0.322
West South Central	12.948	33.146	0.696	1.112	0.870	0.201
Mountain	-37.671	35.582	0.290	0.286	0.930	0.758
East North Central	-1.378	28.492	0.961	1.286	0.747	0.085
West North Central	0.934	38.157	0.980	2.633	0.997	0.008
Constant	109.975	95.562	0.250	6.038	2.497	0.016
σ	300.030	7.128		8.236	0.167	
Likelihood ratio	68.310		0.000	51.010		0.000
N=	1769			1769		
Left Censored=	691			273		
Right Censored=	34			125		

Table 9: Spending and Driving - Ordered probit

	Spending			Driving		
	Coeff.	Std.Err.	p-value	Coeff.	Std.Err.	p-value
White	-0.246	0.062	0.000	-0.001	0.059	0.987
Male	0.106	0.055	0.055	0.131	0.052	0.011
Income 2	0.281	0.063	0.000	0.154	0.059	0.010
Income 3	0.301	0.074	0.000	0.291	0.070	0.000
Income 4	0.536	0.098	0.000	0.503	0.094	0.000
Log Age	-0.118	0.095	0.213	-0.102	0.090	0.256
Finalist	0.016	0.096	0.865	-0.054	0.091	0.558
Mid Atlantic	0.000	0.099	0.999	0.008	0.094	0.936
New England	-0.001	0.132	0.996	-0.156	0.127	0.217
South Atlantic	-0.014	0.088	0.870	0.022	0.084	0.790
East South Central	0.087	0.129	0.502	0.114	0.123	0.353
West South Central	0.030	0.113	0.790	0.107	0.107	0.319
Mountain	-0.117	0.122	0.338	0.068	0.115	0.551
East North Central	-0.028	0.097	0.774	0.141	0.092	0.126
West North Central	-0.010	0.130	0.938	0.343	0.123	0.005
Likelihood ratio	67.400		0.000	58.190		0.000
N=	1769					

Table 10: Spending and Driving - Ordered Probit - threshold paramenters

	Spending				Driving			
	Coeff.	Std.Err.	95% Conf. Interval		Coeff.	Std.Err.	95% Conf. Interval	
μ_1	-0.601	0.327	-1.241	0.039	-1.087	0.309	-1.693	-0.481
μ_2	0.551	0.326	-0.089	1.190	-0.393	0.308	-0.997	0.211
μ_3	1.018	0.327	0.377	1.659	0.390	0.308	-0.214	0.994
μ_4	1.433	0.329	0.789	2.077	1.082	0.309	0.476	1.688
μ_5	1.641	0.330	0.993	2.288	1.448	0.310	0.840	2.056
μ_6	1.809	0.333	1.157	2.461				

Table 11: Regional WTP
(billions of dollars)

Mid Atlantic	3.974
New England	1.187
South Atlantic	5.947
East South Central	1.535
West South Central	3.56
Mountain	1.359
East North Central	3.842
West North Central	1.686
Pacific	4.614

The Questionnaire

1. Do you want the United States to host the Summer Olympic Games?

    a. Yes
    b. No

2. How far from your current living location are you willing to travel to the Summer Olympic Games?

    a. 0-2 driving hours
    b. 2-6 driving hours
    c. 6-12 driving hours
    d. 12-24 driving hours
    e. 24+ driving hours
    f. Not at all

3. How much are you willing to spend in a one-time lump sum tax to have the Summer Olympic Games in your region?

    a. $0
    b. $1-$200
    c. $201-$400
    d. $401-$600
    e. $601-$800
    f. $801-$1,000
    g. More than $1,000

4. Which of these destinations would be your preferred summer vacation?

    a. Disneyland
    b. Las Vegas
    c. Washington D.C.
    d. The Summer Olympic Games

5. Circle the answer choice, “Finding Nemo”:

    a. Toy Story 3
    b. Wall-E
    c. Finding Nemo
    d. Cars

6. What is your zip code? _____

7. What is your sex?

    a. Male

b. Female

8. What is your age? _____ years old.

9. What is your race?

a. Caucasian/White
b. African American/Black
c. Hispanic
d. Asian American
e. Native American
f. Native Hawaiian/Other Pacific Islander
g. Multi-racial
h. I'd prefer not to specify

10. What is your annual household income?

a. $0-$30,000
b. $30,000-$60,000
c. $60,000-$100,000
d. More than $100,000

Note: question 5 was intended to weed out responses from programmes seeking to maximize income.