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Willingness to Pay for Recreational Parks in Addis Ababa: An Empirical Investigation of the Application of Multivariate Analysis

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ABSTRACT

Willingness to pay is the maximum price at or below which a visitor will definitely buy one unit of product. This study examines the willingness to pay for recreational park services of two parks in Addis Ababa and to determine the attributes of willingness to pay of the recreational parks. The data were collected from a sample of 180 visitors in Addis Ababa recreational parks. The multivariate regression results obtained from this study indicated that travel costs, visitor's income, and the number of years a visitor know the recreational parks were important determinants factors of the WTP of the sample visitors of Addis Ababa recreational parks. The coefficient of travel cost is negative and significant implying that an increase in travel cost reduces the number of visits of the site. Similarly, the coefficient of income variable is positive and significant implying that the demand for recreation increases as visitor's income increases. The attractiveness and shortcoming of the recreational parks are identified in order to suggest for improvements of services to visitors. As the economic growth and awareness of the people increase, people will demand for better services and facilities or else willingness to pay will be affected. Thus, it is important for the private and public recreational parks to upgrade their services and facilities over time to fulfill the needs of the people.

***Keywords*:** Willingness to Pay, Recreation Parks, Hamle 19 and Future Park, Recreational Parks in Addis Ababa

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1. INTRODUCTION

Recreational parks benefit community, regions and nations in many different ways. They can give us a real benefit to both, physically and psychologically (mentally) (Clawson *et al*., 1996). They perform not only ecological functions but also provide recreational facilities to visitors (Yeoman, 2001). They are a source of valuable foreign exchange earnings to national exchequers. Moreover, recreational parks plays a significant role in creating social capital, contributing to healthier citizens, preserved natural capital, improve the image and character of urban community and it provide positive economic benefits.

Willingness to pay (WTP) is the maximum price a buyer accepts to pay for a given quantity of goods or services (Marine, 2009; Khan, 2006; Khan, 2007; Alberini, 1995). It is the most a visitor will spend on a recreational service. So economic researchers see WTP as the reservation price, entrance fee (Reynisdottir *et al*., 2008). the limit on the price of a product or service. Others conceptualize willingness as a range, a product's or service's price may range from a specific amount up to the WTP level. Moreover, WTP is the maximum amount an individual is willing to hand over to procure a product or service. The price of the transaction will thus be at a point somewhere between a buyer's willingness to pay and a seller's willingness to accept. Contingent valuation is a survey based approach, in which individuals are asked to give their opinion on the maximum amount that they willing to pay in order to utilize the public amenities (Amiran, 2002; Davis, & Tisdell, 1998; Hanemann, 1994). According to Clark (2003) the evaluation of willingness to pay among visitor is based on their experience and expectation of services that public ecotourism organization should render. Research by Williams *et al*. (1999), Kyle *et al*. (2003), and Chung *et al*. (2011), the expected relationship between WTP a fee and willingness to visit would be positive if recreators deem there would be benefits from the fee.

Despite such benefits, recreational parks in Ethiopia has not been contributing significantly to the nation and community. Because, the growth of modern urban green infrastructure facilities still remain at lower level due to lack of strong urban organizational structures. These are the reflections of political environments and socioeconomic development stages similar to all other sectors. Consequently, the development of urban green infrastructure facilities had been suffering from lack of popular base. And also, the overall negative and undesirable impact caused by one or another reason may be associated with insufficient attention and funding has been given for managing these parks (Grandstaff & Dixon, 1986; Kaosaard *et al*., 1995).

Convincing estimates of WTP essential for developing an optimal pricing strategy. Similar arguments about the importance of WTP and perceptions of value by customers can also be found by many other authors (Monroe, 2003; Nagle & Holden, 2002; Hanker, 1997). Such estimates can be used to forecast market response to price changes and for modeling demand functions. Furthermore, various approaches to measure brand equity emphasize customers' WTP in terms of the (monetary) added value endowed by a brand to a specific product vis-à-vis its' competitors or an unbranded baseline product.

There are different factors that affect willingness to pay such as price vs quality effect, unique value, expenditure effect, the effect of customer characteristics, environmental effect, fashion effect, fairness, customer research effect. According to different studies, respondents are asked to state how much they would be willing to pay for some product. In indirect surveys some sort of rating or ranking procedure for different products is applied in order to estimate a

preference structure from which WTP can be derived (Keske *et al*, 2013; Moore et al, 2010). Conjoint analysis and discrete choice analysis are examples of indirect surveying methods. In practice, selecting a feasible method for measuring WTP is often restricted, for example, by time or monetary constraints. Therefore, the objective of this study is to examines the willingness to pay of Addis Ababa visitors to recreational park services in Ethiopia.

2. MATERIALS AND METHODS

2. 1. Selection of the study area

There are about 19 publicly managed and administered parks and 6 privately managed and administered parks in Addis Ababa. These parks are found in nearly all the sub-cities of Addis Ababa. For this study, I have selected one publicly managed and administered park (Hamle 19 Park) and one privately managed and administered park (Future Park). The reason for selected these two parks; they are almost similar in scenic values and cover a wide area with green shade trees and featuring some indigenous trees.

Hamle 19 park

Future park

2. 2. Methods of data analysis

The econometrics model used to find the recreational demand function and the consumer willingness to pay for the use value of Hamle 19 and Future Parks uses information from Travel cost method. Count data models have become the standard in the recreation demand models (Creel & Loomis, 1991). Regression models for counts differ from the classical regression model in that the response variable is discrete with a distribution that places probability mass at nonnegative integer values only.

In order to understand the determinants of the visitor's WTP responses and to see whether these determinants are consistent with economic demand theory, a series of multivariate analyses were performed with the data obtained from the questionnaire (Abala, 1987). Various independent variables were used to attempt to explain the variation in different measures of visitor's WTP for improved recreational services of the two parks.

This study was concentrated on the users' group for a number of reasons. The individual visitors instead of households were chosen as respondents for interview. "Visitors" were broadly defined as those who use the two parks for recreation. On the whole 180 respondents (90 sample visitors from Hamle 19 and 90 sample visitors from Future Park) were interviewed for data collection. The visitors were randomly chosen for interviews. Specifically, visitors were either interviewed at the gate when they were entering into park or in the park enjoying recreational benefits. The desired data were collected with the help of a pre-tested interview schedule. Additionally, Truncated Negative Binomial Model (TNBM), Truncated Poisson Model (TPM), Negative Binomial Model (NBM), Poisson Model (PM) models were also estimated to explain variation in the respondents' WTP responses.

Recreational site trip data is generated by a stochastic process; dependent on the sampling method that was used. Researchers assume the dependent variable, the number of trips, is assumed to be distributed continuously or discretely. There have been applications in which the researchers assume that the number of trips is distributed continuously. Early applications used ordinary least squares on aggregate zonal data.

The theoretical basis for using count data models is very important for interpretation of estimation results. The problem in using the standard microeconomic approach is that if trips are non-negative integers, differential calculus cannot be used to obtain the optimal consumption bundle. Address the problem by adding an additional constraint that the number of trips must be a non-negative integer. Their solution requires that each individual has a set of unobserved factors that given a price, determines the quantity of trips that are taken. This along with observable factors such as price and income will yield a distribution of demand that can be modeled using a count data distribution (Hellerstein, 1991; Hellerstein & Mendelsohn, 1993).

The Poisson probability density function is

$$\Pr(Y = y_i) = \frac{e^{-\lambda}\lambda_i^{yi}}{yi!},\ y_i \in \{0\} \cup Z^+ \qquad \text{..... (1)}$$

with i=1,…, n observations. The mean $E[Y] = \lambda_i$ and $Var(Y) = \lambda_i$. To apply the equation for the purpose of regression, assume $y_i \sim$ Poisson (λ_i), and λ_i is assumed to be a function of a 1 x k vector of covariates x_i and a k x 1 vector of coefficients β. The functional form of the parameterization for the conditional mean is

$$E[Y \mid X] = \lambda_i = \exp(x'_i\beta) \qquad \text{..... (2)}$$

In many empirical applications of recreation demand, trip counts are often over dispersed. A reason for this is because many users only take a few trips and a few take many trips. Although econometricians have modified the Poisson regression model to deal with over dispersion, a popular alternative has been the use of the negative binomial regression model. The probability mass function for the negative binomial distribution is

$$\Pr(Y = y_i) = \frac{\Gamma(yi+r)}{\Gamma(r)\Gamma(yi+1)} p^r (1 - P)^{yi},\ y_i \in \{0\} \cup Z^+ \qquad \text{..... (3)}$$

where: Γ (.) is the gamma function. The mean and variance of the negative binomial are E[Y] = μ = r $\frac{1-p}{p}$ and Var(Y) = r $\frac{1-p}{p^2}$. It is common to parameterize r and p in the terms of α and μ. Define α = $\frac{1}{r}$, then μ = $\frac{1-p}{\alpha r}$, solving yields p = $\frac{1}{1+\alpha\mu}$.

3. RESULTS AND DISCUSSIONS

A structured questionnaire was prepared and administered to collected data from 180 sampled visitors from the onsite interview in order to address the research objectives. The survey result showed that there were less female visitors to visit the recreational parks, only 29.4 percent. Moreover, the survey result indicated that the majority of visitors to Addis Ababa recreational parks were single and divorced.

3. 1. Attributes of the parks and factors that attracted visitors

Visitors have their own reasons to visit or not to recreational parks in Addis Ababa. Among others, the major reasons of visitors to visit recreational parks are fair price of the entrance and service prices, historical significance, easy to access, the scenic value of the parks. As shown in Table 1 below, 87 percent of the sample visitors strongly agree the entrance fee to visit the recreation parks in Addis Ababa were reasonable and fair, that is why they were frequently visit the parks. About 66 percent of sample visitors strongly agree the views of the recreation parks are good. The majority of sample visitors 48.9, 29.4, 25.6 percent were neutral about the historical significance of the recreation parks, the good services and facilities of the recreational parks of Addis Ababa.

Table 1. Attributes of the parks and factors that attracted visitors.

Activities	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
The view in the park is good	-	-	1.1	33.33	65.67
The park has great historical significance	-	11.1	48.9	37.8	2.2
The park has good service	-	5.6	29.4	52.2	12.8
The park is clean and well maintenance	-	-	17.8	53.9	28.3
The park has good facilities	5.6	15.6	25.6	33.3	20
The entrance fee is reasonable	-	1.1	1.1	10.6	87.2
It is easy to access to the park	-	1.7	6.7	43.9	47.8

Source: Computed from the survey data

3. 2. Major Purposes of Visitors to Recreational Parks

As indicated in Table 2, the majority of visitors come to recreational parks for relaxing and sitting, enjoying scenic beauty, eating and drinking, and reading. Among the total sample visitors about 24 percent of the respondents responded as they visit parks to relaxing and sitting to enjoy the environment; 21.27 percent of them to eating/drinking; those who come to the parks to enjoying and admire scenic beauty and to walking through accounted 19.4 and 13.62 percent respectively. And those who come to read accounted 5.97 percent; attending community events accounted 3.54 percent and meeting with family or friend accounted 3.92 percent.

Table 2. Distribution of respondents by response on reason to visit Recreational Parks.

Purpose of visit	Park Name		Overall (n = 180)
	Hamle Park	Future Park	
Walking through/hiking	56	17	73 (13.62%)
Exercise/sports	1	0	1 (0.19%)
Eating/drinking	41	73	114 (21.27%)
Reading	29	3	32 (5.97%)
Entertaining children & family	8	8	16 (2.99%)
Relaxing/sitting/hanging out	48	80	128 (23.88%)
Enjoying scenic beauty	47	57	104 (19.4%)
Attending community events	8	11	19 (3.54%)
Meeting with family or friend	3	18	21 (3.92%)
Others	27	1	28 (5.22%)

Source: Computed from the survey data

3. 3. Monthly Income of Sample Visitors

Table 3. Monthly income of visitors in Birr.

Monthly Income (ETB)	Hamle 19 park		Future park		Overall	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
No Income	20	22.22	4	4.44	24	13.33
<=2,000	8	8.89	7	7.78	15	8.33

2,001 – 4,000	21	23.33	12	13.33	33	18.33
4,001 – 6,000	24	26.67	24	26.67	48	27.67
6,001 – 8,000	11	12.22	9	10.00	20	11.11
8,001 – 10,000	3	3.33	14	15.56	17	9.44
>10,000	3	3.33	20	22.22	23	13.78
Total	**90**	**100.00**	**90**	**100.00**	**180**	**100.00**

Source: Computed from the survey data

As shown in the Table 3 below, about 87 percent of sample visitors did earn monthly income and 13 percent did not have their own income. Among the non income visitors 22.22 and 4.44 percent from Hamle 19 and Future parks, respectively. The average monthly income of respondents was Birr 4,046.67 and 9,412.23 for Hamle 19 and Future parks respectively. Results also show that 11.11% of sample visitors had an income between Birr 6,001 and Birr 8,000 and this range of income related to the average income of the sample respondents, Birr 6,729.45.

3. 4. Willingness to Pay the Maximum Amount of Money for the Recreational Parks

Table 4. Maximum amount of money visitors were willing to spend for travel the parks beyond the present cost.

	Park Name		**Overall (n = 180)**
	Hamle Park	**Future Park**	
Not willing to pay beyond	1 (1 %)	56 (62 %)	57 (32 %)
2 times of the present cost	40 (44 %)	28 (31 %)	68 (38 %)
3 times of the present cost	34 (38 %)	6 (7 %)	40 (22 %)
4 times of the present cost	15 (17 %)	0(0 %)	15 (8 %)

Source: Computed from the survey data

Previous studies revealed that if the visitors are satisfied with the services and the scenic beauty of the parks, the visitors are willing to pay more at the current price. As indicated in Table 4 below, the cost of visiting private parks are more expensive than public parks, and then the sample visitors are not willing to pay more at the private parks more than the current price.

Study findings shows that about 32 percent of visitors were not willing to pay beyond the present cost and about 38 percent of visitors were willing to pay two times of the present cost.

And, about 22 percent of the visitors were willing to pay three times of the present cost, only 8 percent were willing to pay 4 times the present cost.

The primary aim of travel cost method is finding the use value of recreational demand benefits and computation of consumer surplus for each recreational trip. The appropriate recreational demand function is derived from the regression result between the expected number of trips and travel cost. The regression result from Truncated Negative Binomial Model (TNBM) is presented in Table 5 below.

Table 5. A maximum likelihood estimation of the TNBM Regression.

Visits	Coef. sign	Coef.	Std. Err.	z	P>z
Gen	+	0.2403346	0.1263818	1.90	0.057
Age	-	-0.0074184	0.011264	-0.66	0.510
Mstatus	+	0.2399297	0.1385155	1.73	0.083
Fsize	-	-0.0418604	0.0303422	-1.38	0.168
Edu	-	-0.0554181	0.0643285	-0.86	0.389
Occ	-	-0.1267675	0.0495788	-2.56	0.011
Income	+	0.0000207**	8.96e-06	2.32	0.021
Transport	-	-0.0214196	0.0894245	-0.24	0.811
Know	+	0.1072222***	0.0193107	5.55	0.000
Group	+	0.6272309	0.2179768	2.88	0.004
TC	-	-0.002051**	0.000925	-2.22	0.027
_cons	+	1.36124	0.5479626	2.48	0.013
$LRchi^2$ (11) = 66.43				Log likelihood = -582.99884	

Source: Own computation
*** 1 percent level of significance
** 5 percent level of significance

3. 5. Willingness to Pay for Improved Services: Results from Multivariate Analyses

To better understand the determinants of respondents' WTP responses and to see whether these determinants are consistent with economic demand theory, a series of multivariate analyses were performed with the survey data. Table 6 presents results of four multivariate models (Truncated Negative Binomial Model (TNBM), Truncated Poisson Model (TPM), Negative Binomial Model (NBM), and Poisson Model (PM) of the determinants of the WTP

responses. Three of the independent variables (income, know and TC) are statistically significant determinants of visitors' WTP in all four of the multivariate models.

Sample visitors' income is statistically significant indicating a positive correlation with visitors' WTP for better recreational services of Addis Ababa parks. The number of years visitors know the recreational parks is statistically significant and have impact on WTP responses. Similarly better quality of recreational services also attracts a higher amount of WTP. Travel cost and time cost to the recreational parks is statistically significant and has a negative effect coefficient implying that higher travel costs to parks reduces visitors WTP.

Table 6. Multivariate Models of the Determinants of Visitors' WTP Responses.

Explanatory Variables	TNBM	TPM	NBM	PM
Gen	0.2403346	0.2332243	0.2299726	0.2326668
Age	-0.0074184	-0.0182099	-0.0074787	-0.018191
Mstatus	0.2399297	0.3509474	0.237054	0.3507674
Fsize	-0.0418604	-0.0508583	-0.0399773	-0.0506864
Edu	-0.0554181	-0.039092	-0.0521976	-0.0390125
Occ	-0.1267675	-0.1437044	-0.1223673	-0.1434789
Income	0.0000207**	0.0000165**	0.0000198**	0.0000165**
Transport	-0.0214196	-0.0816654	-0.0222594	-0.0817515
Know	0.1072222***	0.1068549***	0.1037576***	0.1067466***
Group	0.6272309	0.7251479	0.6189792	0.7249134
TC	-0.002051**	-0.001384**	-0.001957**	-0.001382**
_cons	1.36124	1.586738	1.403883	1.587409

Source: Source: Computed from the survey data
*** 1 percent level of significance
** 5 percent level of significance

4. CONCLUSIONS

The level of willingness to pay for recreational parks in Addis Ababa recreational parks may difference as the sample respondents have different point of view and ability. Based on the study, the main motivation of willingness to pay towards the recreational parks are the view of the park, the great historical significance, the good service of the parks, the fairness of the entrance fee, easy access of the parks and the cleanness and good facility of recreational parks.

The multivariate regression results obtained from this study showed that travel costs, visitor's income, and the number of years know the recreational parks were important determinants factors of the WTP of the sample visitors of Addis Ababa recreational parks. The coefficient of travel cost is negative and significant implying that an increase in travel cost reduces the number of visits of the site, as would be expected. Similarly, the coefficient of income variable is positive and significant implying that the demand for recreation increases as visitor's income increases.

The results of the study and many other valuable researches indicated that people are willing to pay an amount of their revenue for utilizing the facilities of natural pristine and tourism environments in different places. This shows that nature and recreation are the necessities of today's human life at the age of technology and mechanization. Moreover, the study revealed that sample visitor's WTP increase with their educational status and declines with the increase in their age. This indicates that youth have higher WTP for using recreational parks.

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