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ANALAYZING THE EFFECTIVE FACTORS ON TOURISM DEMAND IN ELGOLI JUNGLE PARK OF TABRIZ CITY, IRAN

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Abstract: This study aimed to estimate tourism demand function of Tabriz Elgoli Park in Iran by travelling costs pattern in the frame of household production function, and then effective factors of the issue are investigated. The method of study is based on the estimation of tourism production functions, final cost of travelling, and calculating the shadow price of tourism. According to the results of the study, time, distance and travel costs affect on tourism and the final cost of tourism is calculated as 3368825.7 Rials per day. Findings show that there is a positive relationship between tourism with travelers' income, quality of the park, educational level of visitors and a negative relationship with final cost (shadow price) of the tourism. The results of estimation model express that among all factors, the quality of park is the most effective factor in tourism demand. Therefore, any consideration of responsible people to the environmental quality of the park would increase tourist attraction, which leads to economical prosperity of the region.

Key words: Household production function, Tourism demand, Econometric model, Elgoli Park

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INTRODUCTION

Tourism industry is always considered as an appropriate choice to absorb economical incomes and an important source of employment. In fact, tourist attraction is an economical activity which has less posited limitations comparing services and goods production and in case of taking attention, this section would be profitable (Allan, 2015). Therefore, paying attention to environmental recourses and parks could lead to economical prosperity and employment increase. Among the environmental recourses, the parks play a vital role to increase welfare. People have usually no imaginations of environmental recourses except being free of costs. So, inattention to the costs of these recourses in decision making level would lead to chose liable policies. Tabriz is considered as one of the seven metropolises of Iran and the biggest city in north-western area. Tabriz'

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elevation range between 1,350 and 1,600 meters above sea level. The valley opens up into a plain that gently slopes down to the eastern shores of Lake Urmia, 60 kilometres (37 miles) to the west. With cold winters and temperate summers, the city is considered a summer resort. The city is famous for its handicrafts including hand-woven rugs and jewelry. It is known for locally made confectioneries, chocolates, dried nuts, and traditional food. Tabriz is also an academic hub and a site for some of the most prestigious academic and cultural institutes in the northwest of Iran (Haiati, 2012).

Urban parks of Tabriz form more than 30 percent of general green space of the city, which includes 134 small and big parks spreading along different zones (Amirnejad, 2012). Total area allocated for these parks is about 435 hectare which equals 3.18 square meters per person including the most effective recreational green lands of the city. According to historical documents of the city, Elgoli Park has been established in 1785 in east part of Tabriz. It has an square artificial lake surrounded by side walk in four sides. There is also a building in the middle of the lake, with traditional architecture of Iranian Azerbaijan. In South of the lake there is a hill covered by trees. Two beautiful stairways connecting the side walk to the top of the hill. At top of the hill there is a building with modern architecture (Hotel Pars building). The space of this park is 61 hectare and dimension of central lake is 20*20 meters (Haiati et al., 2012). Tabriz Elgoli Park accepts a numerous visitors and tourists both in holidays and regular days. In this survey, the effective factors of tourism demands in Tabriz Elgoli Park are being investigated. For this purpose, the function of demand for using the park is utilized. In tourism demand, the relationship between shadow prices and visitors income with the rate of tourism demand is investigated and finally, the relationship between park quality and educational level of people with tourism demand is analyzed.

The history of studying about the pattern travelling costs to parks and environmental resources goes back to Harold Hotelling studies in 1930 and 1947. This method was used in an exact way in 1967 by Clawson. In his article (1991), Gary Becker states that the satisfaction of a person from a non-marketing activity is a function of designated time, opportunity cost and environmental inputs that leads to utility from visiting a site, which is the household production function (Quant, 2013). Altogether, the value of an environmental resource is calculated according to the costs of a family while visiting a site (including the costs of accommodation, food, transportation and …) and costs of time opportunity. In this methodology, investigation approach is based on the preferences manifested by Samuelson. In his theory, Samuelson tries to exempt the behavior of consumer from the last signs of utility concept; and for this purpose, this theory is being limited to operational comparisons among value amounts. If the consumers prefer higher amount of goods to lower amount and chose only one certain basket of goods in any budgeting conditions and act compatibly in their successive choices, then they would purchase less amount of the goods which has an increased cost. Whereas their income increases, they would purchase more amounts of those goods. This is the generalized principle of demands, or as Samuelson says, the fundamental theory of consumers' behavior which includes all reasonable observable consequences of the indifference curves. Moreover, it has the advantage that consumers' preferences could be concluded from their observable behaviors, not the conversely.

The consumption hypothesis by Gary Becker became the basis for the following ideas in environmental economies and tourism industry. Based on the hypothetical frame of Gary Becker's model, Pajooyan introduced the function of tourism production in 1978 and according to a two-stage approach, estimated the shadow price of tourism. After Pajooyan, Han (1980) indicated that the value of travel time is 20 to 53 percent of gross income. Lee & Han (2009) estimated the tourism value of 5 five national parks in South

Korea to be about 11 dollars per family. Also, Mendez (2011) investigated the non-market value of urban parks in Valencia, Spain and he estimated the total value about 11945 pesetas annually. Contingent valuation method, Tobit model and half logarithm approaches are used to calculate the issue. In Iran, Naharli (2012) estimated the tourism value of Naderi City Park by Clawson method 1.59 million Rials. Mojabi and Monavari (2012) investigated and economically validated Tehran's Lavizan and Pardisan parks by Clawson method. In this study, the researchers draw the demand curve based on the maps and social and economical specifications of the parks' visitors.

Their estimation demonstrated that the recreational value of Pardisan Park was 78 million Rials and, it was 53 million Rials for Lavizan Park. Pajooyan and Falihi (2012) analyzed the economical value of Anzali pond. In this study, they utilized Gary Becker's household production function. The results show that the time, distance and travelling costs affect on tourism production. In this study, the final cost of tourism is estimated 1.1.00.000 Rials per day, which is the shadow price of tourism.

Also according to the research, tourism demand has a negative relationship with shadow price and a positive relationship with income. Amirnejad et al. (2012) determined recreational value of Tabriz's Elgoli Park by Contingent Valuation Method and binary choice questionnaire. After calculations, they estimated the willingness to pay as 359988 Rials per family and willingness to pay for all visitor families to utilize this complex as 224.99 million Rials per month.

Haiati et al. (2012) studied the factors which motivate visitors' willingness to pay for Elgoli and Mashrote Park in Tabriz city by applying two stages Heckman approach. The findings of this research shows that the effective variants for willingness to pay include time for each visit, monthly income, education and age of the visitors. In this study, the willingness to pay of each visitor is estimated to be 2231 Rials per visit.

MATERIALS AND METHODS

Assume that there is a consumer and environmental goods called the park. The park has a level of quality equal to (q) which has a positive effect on the number of visits (v) from the park (Pollak, 2011). Here, the person as a function of household production combines the time with market goods or environmental goods, and when the combination of time and environmental good forms, tourism becomes to have meaning and the consumer makes a choice among buying foods and services and visiting the park (v).

In this case, utility function is as following:

$$U = f\,(C_M, C_H, Z, Q) \tag{1}$$

Where U is the level of utility, C_M the final services and goods purchased from the market, Z the level of tourism. In which the function of household production is defined as:

$$C_H = f(X_H, t_H) \tag{2}$$

In this function, x_H the function of market goods and t_H the time spent to produce goods are combined. The function of tourism production in the park is defined as follows:

$$Z = f\,(Xz, Tz) \tag{3}$$

Where X_z is the goods and services required for travelling and using touristic space of the park. In this situation, time and budget limitation is as follows:

$$T = Th + Tz + Tw \tag{4}$$

$$p_m c_m + p_n x_n + p_z x_z + T_w w + T_z w = w T_w + Y \tag{5}$$

In the restriction of time and budget, y in the non-labor income, P_z the price of travelling, w the rate of wage, t_w the labor time and T the total time (except leisure time).Using Lagrange function is helpful to optimize the problem, so demand function for travel would be as follows:

$$Z = f(y, p_{zt}, q) \tag{6}$$

$$Y = t_w W + V \tag{7}$$

$$P_{zt} = P_z + (t_z W) \tag{8}$$

Equation (6) expresses function of demand for travel which is a function of total level of income, total price of travel (traveling cost and time opportunity cost) and park quality (Willis, 2012). It should be mentioned that the time opportunity cost is a product of travel time to wage rate. In this research, in addition to methodology based on the consumers' behavior and Becker's function of household production, the researchers used Pajooyan's methodology (1978), estimation of tourism production functions and total price calculation to calculate travel price which leads to shadow price of tourism. According to Becker's function of household production, it is assumed that none the goods and services purchased by consumer are neither final ones nor consumed directly, so in addition to the purchased goods and services, the consumer combines time input with market goods to have combined good production as result. Since the price of tourism services and goods might not be observable in the market, so in this part we use a two-stage method to extract the function of travel demand (Smith, 2011).

At the first stage, the function of combined goods and technology limitation is defined as follows:

$$Min \sum Pxi Xi + W \sum Ti \tag{9}$$

$$Sto: V(X.T) - V = 0 \tag{10}$$

Where (v) expresses the vector of combined goods, (x) the vector of market goods and (t) the vector of time input. Now, by using Lagrange function and assuming price acceptance for people, the function of demand for X and T would be as follows (Fleming, 2008):

$$Xi = f(Pxi, W, Vi) \tag{11}$$

$$Ti = f(W.Pxi, Vi) \tag{12}$$

Equation (11) is demand function for market goods which shows that the price of market good is affected by micro economical factors such as market price of the goods, received wages, and vector of combined goods. Equation (12) shows that the time spent for purchasing or demanding tourism is also affected by wages, market price of the goods and vector of combined goods directly.

Now, if we put the X and T in equation, the cost function would be resulted as follows:

$$C(Px.W, V) = \sum Pxi(X(Pxi, W, Vi)) + W \sum T(W, Pxi, Vi) \tag{13}$$

Bruzelius (2013) demonstrated that in case of lack of additional production, cost function could be written as:

$$C = (Pxi, W, Y) = C_r(Pxi, W, R) + C_z(Pxi, W, Z) \tag{14}$$

In the present situations, it is possible to calculate the shadow price of combined goods by partial derivative of cost function as follows:

$$\pi_R = f(Pxr, W, R) = \frac{\partial C}{\partial R} = MC_R \tag{15}$$

$$\pi_R = f(Pxr, W, Z) = \frac{\partial C}{\partial Z} = MC_Z \tag{16}$$

Where MC_R is the final cost of production R, and MC_Z is the final cost of production Z. So, by this method shadow price per day of travel to park is obtained. According to Pollak, shadow price is a function of goods price and wage rate and budget limitation can be defined as follows:

$$\pi_R R + \pi_Z Z = Y \tag{17}$$

In the second stage, the utility is maximized according to the considered budget.

By maximizing utility with regard to budget limitation, the function of tourism demand in Elgoli Park of Tabriz in Iran could be obtained as follows:

$$DR = D(\pi_R, \pi_Z, Y) \tag{18}$$

It is possible to assume a fixed rate for the price of other goods which leads to the assumption that the demand for tourism and travel to park is a function of tourism shadow price and income of traveler. If the production function is considered in the form of Gobb Douglas, then the model approaches to be a mathematical one. So:

$$R = AX_1^{\alpha 1} X_2^{\alpha 2} T^{\alpha 3} \tag{19}$$

In equation (19) a function with three variables is considered for tourisim and visiting the park in with the variables are independent and the required inputs are: personal car (X_1), other facilities for tourism (X_2) and the time spent (T) for tourism production. Now according to the findings of Willis (2012) it is possible to obtain cost function according to the double function of production. Here the total cost function will be a function of inputs' price:

$$TCR = KR^{\frac{1}{n}} W^{\frac{\alpha 3}{n}} p_1^{\frac{\alpha 1}{n}} p_2^{\frac{\alpha 2}{n}} \tag{20}$$

In the equation of tourism total cost, n is the return to scale parameter which equals to numerical addition of costs attractions. Here, the return to scale is considered to be constant. Also, in this function, the amount of K is as follows:

$$K = n(A\alpha_3^{\alpha 3} \alpha_1^{\alpha 1})^{\frac{-1}{n}} \tag{21}$$

In which the final cost of tourism or its shadow price would be as follows:

$$MC_r = \pi_r = \frac{\partial TCR}{\partial R} = KW^{\alpha 3} P_1^{\alpha 1} P_2^{\alpha 2} \tag{22}$$

Now, after determining shadow price of tourism, it is possible to determine the economical value of environmental resources and park. In this study, statistical data is calculated as an intersection by travelers visiting the park and a simple random sampling according to equation 23 (Turner, 2008).

$$n = \frac{Z_{\frac{\alpha}{2}}^2 \sigma^2}{a^2} \tag{23}$$

In this equation, the volume of optimized sample is under the effects of standard normal distribution, the variance of sample property for tourism, and maximum sampling error. Here, the variance of statistical society is determined from a primary sample and hen the statistical sample is calculated as follows:

$$n = \frac{(1.96)^2 600}{(3.4)^2} \approx 200 \quad (24)$$

RESULTS AND DISCUSSION

For this study, cause and effect method has been used. In other words, regression analysis has been established between variables of the survey. Nowadays, in economical analyses, a common approach to study an economical issue and measuring the relationships between its variables is using economy valuation and regression analyses (Greene, 2014). The statistical society of this survey consists of all visitors and users of Tabriz's Elgoli Park. In this method, using simple random sampling, some travelers were selected and the questions and data for model explanation were acquired from them. Using the production function of Gobb Douglas and OLS regression (Ordinary Least Squares) the results of tourism production function for Elgoli Park of Tabriz could be obtained in the following table as:

$$LnTOUP = 23.14 - 0.16LnV + 0.12LnS + 0.17LnZ + 0.11LnPF$$
$$t = (0.22) \quad (-9.2) \quad (5.1) \quad (2.14) \quad (2.13) \quad (25)$$

In this equation, V, S, and Z express the variants cost of using personal car, other inputs of travel (such as food and other costs required while touring), time spent for travelling respectively and Park facilities, which are regressed as a dependent variant on tourism production (TOUP). In order to measure these variants Rials prices of car renting (including fuel price and car amortization), food costs and other requirements of travel such as accommodation (as average) and the time a person spends in the park have been used. Furthermore, the amount of tourism is calculated in the form of time amount in which tourism services are served.

The model shows that the input of vehicle has a negative significant effect on TOUP (tourism production). Notice that the cost of vehicle expresses the distance between places of accommodation to Elgoli Park. So, it could be stated than by distance, the cost of fuel increases too. That is, this variant is a proxy for distance. The results of economy valuation model estimation show that by increasing the cost of vehicle, tourism production decreases. One percent increase in the cost of vehicle can decrease tourism production 0.16 percent. The coefficient of this variant is significant and in accordance with theoretical expectations.

Other inputs of travel (S) such as cost of foods and etc. have a positive effect on tourism production. One percent increase in the cost of other inputs can increase tourism production 0.12 percent.

The input of time (the time a person spends in the park for recreation) has a positive effect on tourism production. One percent increase in the cost of time input can increase tourism production 0.17 percent. The coefficient of this variant is statistically significant and in accordance with theoretical expectations.

The park facilities variabl has a positive effect on TOUP, So that one persent increase in the facilities Such as good weather conditions and environmental stability can increase tourism production 0.11 percent.

It is observed that the signs of tourism production attractions are in accordance with theoretical bases regarding the inputs of vehicle, time and other inputs. The t statistics are shown as independent variants and show significance of 95 percent validity in the coefficients of production inputs. The model's coefficient of determination is 0.94 percent and White test shows lack of heteroskedasticity. The value of Durbin-*Watson* statistics for estimated function is about 1.82 which shows lack of autocorrelation (Table 1 & 2).

Table1. Results of tourism production function (TOUP) estimation
(Data source: research findings)

Variables	Coefficient	T statistic
Ln V	- 0.16	-9.2
LnS	0.12	5.1
LnZ	0.17	2.14
LnPF	0.11	2.13
C	23.14	0.22
R^2= 0.94	DW=1.82	F= 123

Table 2. White test of tourism production function model
(Data source: research findings)

F-statistic	1.84	Probability	0.14
Obs*R-squared SS	7.69	Probability	0.15

Now we obtain the equation for marginal cost of tourism by Wallis. If we put the parameters of tourism production function, then,

$$MCTOUP = (23.14)^{-1}(0.16)^{0.16}(0.12)^{-0.12}(0.17)^{-0.17}(0.11)^{-0.11}P_{PF}^{\ 0.11}R_V^{\ -0.16}P_S^{\ 0.12}W^{0.17} \quad (26)$$

In order to calculate wage rate, total income of the person is divided by total work hours. According to the evaluations, the rate of wages per hour for visitors is 19750 Rials and the rate of wages per minute is 324.2 Rials. The average of other inputs is 1600 Rials and also the average of car rent is considered 850 Rials per hour. In the end with replacing the prices in the equation of marginal costs of TOUP, it is possible to obtain shadow price of tourism per minute. So, shadow price of travel per minute is 2538.8 Rials which equals 3468865.7 Rials for a day in year 2014.

Now if we multiply the shadow price of tourism to the number of park visitors, the value of park in this field could be obtained, which is 11106475000 Rials (assuming 40000 visitors). After estimating shadow price of tourism in park, the researches engaged with estimating tourism demand in the park. The findings from demand estimation are as follows:

$$\begin{aligned} LnDTOU &= 1.15 - 0.11LnSHP + 0.06LnI + 0.08LnEQ + 0.25LnEDU \\ t &= (0.94) \quad (-3.33) \quad (2.76) \quad (2.86) \quad (3.21) \end{aligned} \quad (27)$$

This presented logarithmic function of demand shows that according to demand law, the relationship between shadow price of tourism (SHP) with the amount of tourism demand is negative, whereas the relationship between income with tourism demand is positive, and the quality of park and educational level of people have a positive effect on tourism demand. The findings show that one percent increase in tourism shadow price (SHP) causes 0.11 percent decrease of tourism demand. Also, every one percent decrease of travelers' income leads to 0.06 percent decrease of tourism demand. And one percent increases in the quality of park causes 0.08 percent increase of tourism demand. One

percent increases in the educational level of people causes 0.25 percent increase of tourism demand as well. The presented regression model has high t statistics and all of the coefficients are significant in the level of 95 percent. The model has no heteroskedasticity, autocorrelation or multiple correlation coefficients, and the functional form of the model is correct, so the classical assumptions of economical valuation are applied. Durbin-Watson statistics are about 1.78 and F statistics value in White test is 0.67 which is not rejecting correlation variance assumption. The coefficient of model assignment is 0.93 percent which shows 93 percent of dependent variant changes (tourism demand) are explained by four independent variants (shadow price, income, park quality and education). F statistic of total regression shows the significance of suggested model (Table 3 & 4).

Table3. Results obtained from estimating tourism demand function (DTOU)
(Data source: research findings)

Variables	Coefficient	T statistic
LnI	0.06	2.76
LnSHP	-0.11	-3.33
LnEQ	0.08	2.86
LnEDU	0.25	3.21
C	1.15	0.94
R^2= 0.93	DW= 1.78	F= 148.7

Table 4. White test for tourism demand function model (DTOU)
(Data source: research findings)

F-ststistic	0.67	Probability	0.49
Obs*R-squared	2.46	Probability	0.52

CONCLUSION AND SUGGESTIONS

Nowadays, tourism is a completely different concept comparing past times and its economical background is exceeding day by day. In this study, the method used is based on obvious preference of travelers who express their preferences clearly. This method is derived from Gary Becker's view and describes the production of market goods approach. Using simple random sampling, the optimized number of park travelers is selected first, and then the production function of Gobb Douglas is estimated for tourism production. It is shown that the tourism production in the park is a function of these variants: travelling time, other costs such as food price, and car renting price. After obtaining production function, following the approach of Pollak (2011) the function of final cost (shadow price of tourism) is calculated. The shadow price of tourism for every minute of travelling to park is calculated to be about 5269 Rials which is 7574400 Rials per day.

After calculating the shadow price of tourism for the park and having data of travelers' income, the function of tourism demand is obtained. Studying the function of tourism demand for the park showed that the shadow price has a negative effect on the rate of tourism demand, and a positive effect on income which is in accordance with theoretical expectations and demand law. According to the suggested model, it is shown that the park quality and increase of educational level are among the most important factors for tourism development in this park.

It could be concluded that the environmental quality of the park has the most effect on tourist attraction to this park. So it is suggested to implant and optimize the trees and plants, well-maintenance of the environment (especially water of the pool) and focus on environmental standards. In addition to recreation function, general parks of urban areas have also other roles such as sports, social and cultural functions. So one of the

requirements is to establish and develop green spaces in different areas of city. Regarding the special location and air pollution, Tabriz city requires more green spaces and this issue is to be considered in the planning and policies of town council. Final cost of tourism has a reversed relationship with tourism demand of the Park and choosing new policies for costs decreasing is suggested. As the effect of educational level on tourism demand is positive, it is hoped that by increase of educated people in the society, the number of park visitors would be increased day by day.

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