Estimation of Recreation Value and Determining the Factors Effective in Visitors' WTP for Saint Stepanus Church Using the Heckman Two-Stage and Contingent Valuation Methods

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Abstract: Tourism industry with its special characteristics is considered as a dynamic industry with a shining future. Investment in this industry in all of the countries with tourism attractions is continuously increasing. Tourism can be changed into the exchange income for countries with tourism attractions such as Iran if the right and comprehensive planning, together with foresightedness is regulated and executed for it. In the course of helping the execution of suitable planning in the area of tourist attraction, this research studies recreation value of Saint Stepanus Church, one of the famous Churches in the north-west of Iran, located on the edge of Aras River. Studying the recreation value of this church can be effective in foreseeing the needs, eliminating the shortages and developing the tourism in the region. The aims of the research are separation of factors effective in visitors' willingness to pay for Saint Stepanus Church and factors effective in rate of willingness to pay of visitors from Saint Stepanus Church. Using the contingent valuation and Heckman Two-Stage and Contingent Valuation Methods. Required data was gathered through filling the questionnaire and face-to-face interviewing with 317 visitors from the above said region. Results from the research showed that 68% of the visitors were ready to pay some amount for visiting the Saint Stepanus Church. Variables of income, education levels, family size and the dummy variable of sexuality are effective in visitors' willingness to pay for visiting and variables of income, family size, education levels, age and the satisfaction rate of visitors from the condition of welfare facilities of the church were effective in the rate of willingness to pay for visiting. The average of willingness to pay for visiting, using the contingent valuation and Heckman methods were estimated as 4034 and 4800 rials, respectively and annual recreation value of Saint Stepanus Church using the same methods were estimated as about 322 and 384 million rials, respectively.

Keywords: Contingent valuation · Recreation value · Saint Stepanus Church · Two-stage Heckman · Willingness to pay

INTRODUCTION

Tourism industry with its special characteristics is considered as a dynamic industry with a shining future. Investment in this industry in all of the countries with tourism attractions is continuously increasing. Nowadays, attraction of foreign tourists has been changed into an increasing competition between the institutions involved in tourism industry, because this industry not only has a role in moving the national economy and exchange incomes forward, but it is a neat industry that lacks pollution and at the same time it creates new employments. In fact, tourism industry is the third industry in the world after oil and automobile industries and it plays very important role in producing occupation and income for countries. Tourism industry is among the income distributing industries, because when a tourist enters the country, he must pay expense for services that are offered to him and this payment will be of the exchange nature. So, this industry can be replaced with the single-product economy (such as economies dependent on incomes from oil in Iran).

Iran is among the first ten countries of the world regarding the historical and cultural site and concerning the ecotourism attraction and varieties in climate it is among the five superior countries of the

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world. Despite the available capabilities and potentials in the country, factors such as lack of suitable substructures for nature-touring, lack of knowledge about ecotourism in Iran, shortages in the number of ecotourism specialists, lack of right culture specific for nature-touring that sometimes causes destruction in natural perspectives and lack of information communication in this regard by audio-video media and publications are the main reasons for lack of ecotourism attraction in Iran. This is while, touristy countries with their natural perspectives can cause increase in per capita income. Also, ecotourism often bear inclination towards environment and they can play important roles in refining and protection of environment and development of environmental culture among people of the societies. Thus, ecotourism attraction is an important affair that all countries with tourism attractions should pay special attention to it. In this course, environmental efficiency valuation for correcting the economic decisions, that often view the environmental resources as free of charge goods and services, is considered as an important action. Also, enjoying knowledge and understanding about the environmental benefits, clarification of environmental problems of the country and offering them to the country’s planners for the purpose of suitable decision makings, measuring the role and importance of environmental resources in support for humanistic welfare and sustainable development, preventing many of environment-threatening activities, adjusting and correcting the national accounts such as gross national product and preventing the destruction and irregular use of the natural resources are other reasons for environmental efficiency valuation [1-3]. It should be taken into the mind that although it is possible for some of environmental resources to be considered as worthless at the present time, they can be of more use in future [4]. Existence of exclusive natural resources, different climates and many archeological sites in Iran have created more suitable conditions for development of tourism and ecotourism industry in the country. Due to tourism activities and paying attention to their high potentials in one hand, it is possible to help the public sector income to be increased and developed and on the other hand to take necessary steps to protect environment and consequently, move within the framework of sustainable development. Meanwhile, creating a safe and generative society for the purpose of advancement continuation and economic development requires protection and development of touristy regions to be responsive for ever increasing demands of human beings. Saint Stepanus Church is one of the famous churches in the north-west of the country and it is among the important touristry regions of Azerbaijan province, located on the edge of Aras River, nineteen kilometers from the west of the Jolfa city that has been a place for religious ceremonies of Christians for many years. Ancientness of this church has begun since 4-6th century of Hijri Gamari year and it has nationally been registered as one of the tourism location of the country in 1962 under the number of 429 [5]. According to the available statistics, some about eighty thousand people have made visits from this church in summer 2007 which shows high potential of this region in tourist attraction.

Studying the opinions and desires of people concerning tourism regions and facilities available in them can considerably help to eliminate needs and shortages existent in these regions. One of the indexes that can be an indicative of people's outlook on a tourism region, is the value made by visitors to visit and enjoy these regions. This value belongs to direct benefits from tourism regions and people declare it by expressing the amounts of WTP\(^1\). Many investigations have been made to study the factors effective in visitors' willingness to pay and the amount of benefits from visiting the touristry regions using different valuation methods. Using economical valuation techniques for cultural heritage is somehow a new phenomenon. In comparison with environmental goods valuation on which many investigations have been made, the number of studies made about historical heritage valuation is less and these have been made about historical and archeological heritage valuation [6]. Using CV method Willis [7] estimated the annual average of WTP by each visitor from Durham Church located in UK as 31.5 pounds. Pollicino and Maddison [8] calculated the average WTP of native and non-native families for the purpose of cleaning the appearance of Lincoln Church as 49.8 and 27.7 pounds, respectively. Using CV method, Pagiola [9] calculated the amount of WTP for each native resident and each tourist to repair and renew the Roman Palace located in historical city of Split as 170 and 45 dollars per year for each visit, respectively. Mourato et al. [10] estimated the average WTP per year for each family to protect 164 monasteries belonging to the Orthodox Christians in Bulgaria as 0.6-1 dollar. Using CV method and Tobit, linear, semi-logarithm and Heckman two-stage models, Amigues et al. [11] calculated protective value of habitat of Garon River's Bank in France as 67, 66, 13 and 135 Frank, respectively. Using CV method, Whitehead and Finney [12] valued

\(^1\)Willingness to Pay
North Carolina Bank (America), which includes the remains of about 5000 drowned ships. The average WTP for each visitor and the annual profit due to the historical park management of the drowned ships were estimated as 36 dollars and 1.75 million dollars, respectively. Using CV method, Del Saz Salazar and Marques [13] calculated WTP of families interested in cultural goods to completely renew Arab Castle in Valencia, Spain, as 53-58 pounds and other families as 33-38 pounds. Using CV method, Amimnejad et al. [14] estimated the annual existence value of Iran's North jungles for each family as about 30.12 dollars. Togridou, et al. [15], estimated WTP of visitors from Marrian Rakintoz National Park, Greece, as 120 and 30 BWP. Using CV method, Guruk [16] estimated value of ecosystem services in Barsay State, Turkey, as 67.44 dollars per year for each family. Using CV method, Reyndorottir, et al. [17] showed that the average WTP of individuals as an entrance fee for national park of Eksaftaefi and Goolfluus waterfall, Iceland, were 508 and 133 million ISk, respectively. Adegoj et al. [18] with Logit model were showed that education, contact with extension agents, access to seed and market distance are significant variables that influence fish farmers hybrid catfish adoption and use decisions. Investigations made in Iran shows that a few number of studies have been made about estimating protective and recreational value of promenades and factors effective in the amount of WTP of families. Using CV method, Asgari and Mehran [19] estimated the amount of WTP of families for historical work "Ganj Naameh-e-Hamadan" as 1560 rials for each visit. Using CV method, Amimnejad, et al. [20] estimated yearly protective and recreational values of Noshahr's Seesanghan forest reserve as 5.8 and 2.5 million rials per hectare, respectively. Using CV method, Khosh-Shidoust [21] calculated the amount of WTP of Tabriz People for the purpose of civic environment protection and reduction of pollutions in the city as about 41140 rials per month.

This research attempts to study the factors effective in acceptance or refusal of WTP as well as factors effective in rate of WTP of visitors from Saint Stepanus Church and finally to estimate its recreational value.

**MATERIALS AND METHODS**

This research used contingent valuation and Heckman two-stage methods to estimate the recreational value of Saint Stepanus Church. Contingent valuation method attempts to identify Willingness to Pay of people, under the certain assumed maket scenarios. In Double-bounded Choice method, it is assumed that people bear utility functions, shown in relation 1 [14]:

\[ U(Y, S) \]  

Where \( U \) is indirect utility function, \( Y \) is individual's income and \( S \) is a vector of other eco-social factors of individual. Each visitor is ready to pay some amount of his income for enjoy the environmental resource titled as proposed amount \( (A) \) and this enjoyment causes utility to be created for him. The amount of created utility due to the usage of environmental resources is more than the case in which he doesn't use environmental resources and relation 2 shows it [22]:

\[ U(0, Y - A, S) + e_1 > U(0, Y, S) + e_0 \]  

Where \( e_1 \) and \( e_0 \) are random variables with average 0 that have distributed randomly and independent of each other. Created difference in utility \( (\Delta U) \) due to the effect of using environmental resource is calculated from relation 3:

\[ \Delta U = U(0, Y - A, S) - U(0, Y, S) + (e_1 - e_0) \]  

Double-bounded questionnaire structure in studying the willingness to pay of individuals has a dependent variable with dual selection. So, Logit model for studying the effect of different descriptive variables on the amount of WTP of visitors was used to determine the recreational value. According to the Logit model, the probability of acceptance of the proposed amount by a visitor is expressed as relation 4 [23]:

\[ P_1 = F_{10}(\Delta U) = \frac{1}{1 + \exp(-\Delta U)} = \frac{1}{1 + \exp(-\alpha + \beta A + \gamma Y + \theta S)} \]  

Where \( F_{10}(\Delta U) \) is accumulative distribution function with a standard logistic difference and in this paper it includes some eco-social variables such as income, proposed amount, age, sexuality, family size and education. \( \beta, \gamma \) and \( \theta \) are coefficients that can be estimated and it is expected that \( \beta > 0, \gamma > 0 \) and \( \theta > 0 \). In order to calculate WTP a method known as truncated mean WTP is used, because this method protects the
stability and compatibility of limitations with theory, statistical effectiveness and aggregation. The expected amount of WTP in this method is calculated from relation 5 by numerical integration within the range of 0 to maximum proposal (A) [23]:

$$E(WTP) = \int_{0}^{A} \int_{0}^{\frac{A}{a}} \frac{1}{1+\exp[-(\alpha + \beta A)]} \, dA \, d\alpha$$

$$\alpha^* = (\alpha + \gamma T + \theta S)$$

(5)

In the above relation, where E(WTP) is the expected value of WTP and \(a^*\) is the adjusted intercept which was added by the socio-economic term to the original intercept term of \(a\). Logit models may be estimated as linear or logit functions and the linear function form can easily be used to calculate the WTP mean, so it has been used in most studies. Logit model parameters were estimated using the maximum likelihood method. Elasticity of the \(k^i(X_i)\) descriptive variable in Logit model can be calculated using the relation 6 [24]:

$$E = \frac{\partial (B X_i)}{\partial X_i} \frac{X_i}{(B X_i)} = \frac{e^{\beta x}}{(1 + e^{\beta x})^2} \frac{X_i}{(B X_i)}$$

(6)

Each descriptive variable's elasticity stated that a 1% change in \(X_i\) causes a few percent changes in success probability of dependent variable \(Y_i = 1\). The second method is used for valuation of Saint Stepanus Church and determining the effective factors in WTP of visitors of Heckman two-stage method. This method is used to estimate models that have limited dependent variables. This method has had different usages in studies with different subjects. For example, Gorbani [25], Salami and Ein-Allahi [26], Tamba et al. [27] and Pattanayak and Mercer [28] used Heckman two-stage method to separate factors effective in investment by farmers on agricultural machines and its amount, to study factors effective in decision makings by farmers on beet plantation and factors effective in the amount of its under cultivation area in Khorasan Province, to analyze demand for veterinary services of private sector by farm animal producers in Kenya and to study factors effective in soil protection operations and factors effective in soil quality respectively. Heckman two-stage method is base on the assumption that a series of variables can influence on making decisions about taking part in under consideration activity (WTP) and another series of them can influence the amount of under consideration activity (the amount of WTP) after making primary decisions. Therefore, two different series of variables can enter this model. And if, without regarding this method and consequently, lack of separating the variable into two groups, the aggregate effect of variables on the amount of WTP is measured, then we will encounter the problem of error in estimation. Thus, Heckman offered the two-stage method to solve the problem. In this method, factors that can have effects on decisions made by visitors about the acceptance of WTP, enter Probit model in the form of independent variables and factors that can have effects on the amount of WTP of visitors, take places in the set of independent variables in linear regression model and of course, these two groups of variables are not necessarily exclusive. Probit and linear regression models resulted from the separation of Heckman two-stage model are shown as relations 7 and 8, respectively [29]:

**Probit Model:**

$$Z_i = BX_i + u_i, \quad Z_i = 1 \quad if \quad Y_i > 0$$

$$Z_i = 0 \quad if \quad Y_i \leq 0$$

(7)

**Linear Regression Model:**

$$Y_i = BX_i + \sigma \lambda_i + \nu_i, \quad i = 1, 2, 3, ..., N$$

(8)

In the above models \(Z_i\) is dependent variable that includes binomial variables bearing the amounts of 0 and 1 which represent lack of WTP and WTP of the \(i^{th}\) visitor. \(Y_i^*\) is the latent variable of the model, \(Y_i\) is the amount of WTP of the \(i^{th}\) visitor, \(B\) and \(\sigma\) are model’s parameters that should be estimated and \(X_i\) is descriptive variables of the model and includes visitor’s satisfaction of the state of welfare facilities of Saint Stepanus Church. \(u_i\) and \(\nu_i\) are error terms in the above said models and they are independent of descriptive variables and given the normal distribution with average 0 and variance \(\phi^2\), they are constant. \(\lambda_i\) is Inverse of Mill’s Ratio and calculated using the relation 9 [30].

$$\lambda_i = \frac{\phi(\beta X_i)}{1 - \phi(\beta X_i)}$$

(9)
In the above relation \( \phi(\beta'X_i) \) and \( 1 - \phi(\beta'X_i) \) are density function and standard normal variable distribution function, respectively. At the first stage of Heckman two-stage method, Probit model is estimated using the maximum likelihood method. The second model (linear regression) is estimated by entering a new independent variable named Inverse of Mill's Ratio which is made by using the estimated parameters of the first model (Probit) and Ordinary Least Squares (OLS) for all of the \( Y'_i > 0 \) observations. Greene has showed that the presence of Inverse of Mill’s Ratio in linear regression model, resolves the presence of model's inconsistency variance and makes the coefficients Unbiased and consistent [31]. Whole elasticity is used to measure the effect of the changes in the variable \( X_i \) on \( Z_i \). The whole effect of changes in the independent variable on expected amount of dependent variable \( Z_i \) is calculated using the relation 10 [28]:

\[
\frac{\partial E(Z_i)}{\partial x_i} = B \phi(I)
\]

(10)

In the above relation \( B \) is the estimated coefficient of variable \( X_i \) and \( \phi(I) \) is the probability of presence among visitors who are willing to pay. In order to select the suitable functional form at the second stage of Heckman’s method, the model of relation 11 is estimated using the Mckinon non-nested testing:

\[
\log y_i = h_0 + \sum_{j=1}^{k} h_j \log X_{ij} + \theta v_i + e_i
\]

(11)

After estimating the above model coefficient of \( v_i \) is tested using the Wald test. If the coefficient of this linear model is significant and if the coefficient of this variable is non-significant, then logarithmic model is selected and is used to future analysis. Finally, by replacing the average amount of quantity variables and the mode amount of qualitative variables in selected regression model, the mean amount of willing to pay is calculated. Statistic and information required for identifying the amount of WTP of visitors from Saint Stepanus church was gathered using Heckman method and through filling the questionnaire and in presence interview with visitors from this church, taking the advantages of simple random sampling method among 317 visitors from this church in summer 2008 and this sample number was obtained through Coehman formula and pre test [32]. The questionnaire was designed in two sections. At the first section information related to personal, social and economical characteristic of the responsive individual and at the second part questions related to the WTP of them were put forward. That is to say that, after gaining knowledge about the willing to pay or lack of willing to pay of visitors, they were questioned about maximum amount of willing to pay. However, taking the advantages of CV method, double-bounded Dichotomous Choice (DDC) was used to measure the amount of WTP of visitors and this was offered by Harman and Carson [33], by correction and justification of double – bounded Dichotomous Choice (DDC). This model requires determination and selection of a more offer in comparison with the primary one. The more offering is offered to "Yes" and the less offering is offered to the "No" answers. The said questionnaire was designed in two sections.

In the first section, information related to the personal, social and economical characteristics of the responsive individual and in the second section questions related to WTP of individuals were put forward. In this section three proposed prices of 3000, 4000 and 5000 rials were put forward in the form of dependent and bounded together questions. The said offered amounts were selected on the basis of pre-test. Limdep Software and Shazam software were used to estimate the Logit model and Heckman model, respectively.

RESULTS AND DISCUSSION

Table 1 shows some of the statistics about the variables of age, level of education, family size and monthly revenue of the under-question individuals. Also, frequency distribution of the above said variables are shown in the table together with the percent of their frequencies.

In order to measure the satisfaction of visitors about the state of facilities available in Saint Stepanus Church 11 sentences were designed in Likert measurement scale. Then the mean of 11 sentences was determined as satisfaction index of the visitors. On the basis of the mean and standard deviation, the amount of satisfaction in visitors' opinion was classified in four groups of weak to excellent and the classifying method has been shown in

\(^1\) (\( \tilde{y}_i \)) and (Log\( \tilde{y}_i \)) 1-at first, those logarithmic and linear models are estimated whose dependent variables is shown as, respectively. After calculating anti-logarithm of dependent and regression model (\( \tilde{y}_i \)) and (Log\( \tilde{y}_i \)) variable, \( \tilde{y}_i - \tilde{y}_i \) is defined as \( v_i \).
Table 1: Descriptive statistics of some under study important variables in Saint Stepanus church

<table>
<thead>
<tr>
<th>variables</th>
<th>Unit</th>
<th>Mean</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Standard deviation</th>
<th>Frequency Distribution of variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>year</td>
<td>40</td>
<td>70</td>
<td>22</td>
<td>10</td>
<td>20-30 (23) 30-45 (48) 45-60 (17) 60-70 (12)</td>
</tr>
<tr>
<td>Education level</td>
<td>year</td>
<td>10</td>
<td>18</td>
<td>1</td>
<td>4.6</td>
<td>1-5 (22) 5-8 (21) 8-12 (23) 12-18 (34)</td>
</tr>
<tr>
<td>Family size</td>
<td>number</td>
<td>3.94</td>
<td>9</td>
<td>1</td>
<td>1.38</td>
<td>1-3 (13) 3-5 (57) 5-7 (25) 7-9 (5)</td>
</tr>
<tr>
<td>Income</td>
<td>thousand rials</td>
<td>4398.6</td>
<td>92000</td>
<td>2000</td>
<td>1757.8</td>
<td>200-450 (40) 450-700 (46) 700-950 (9) 950-1200 (5)</td>
</tr>
</tbody>
</table>

*The numbers into the brackets are frequency percent of each variable.

Table 2: Welfare facility state of Saint Stepanus church from the view point of visitors

<table>
<thead>
<tr>
<th>State levels</th>
<th>Domain</th>
<th>Frequency</th>
<th>Percent</th>
<th>Accumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weak</td>
<td>0.07-0.22</td>
<td>136</td>
<td>42.9</td>
<td>42.9</td>
</tr>
<tr>
<td>Average</td>
<td>0.22-0.42</td>
<td>93</td>
<td>29.3</td>
<td>72.2</td>
</tr>
<tr>
<td>Good</td>
<td>0.42-0.57</td>
<td>52</td>
<td>16.4</td>
<td>88.6</td>
</tr>
<tr>
<td>Excellent</td>
<td>0.57-0.85</td>
<td>36</td>
<td>11.4</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>317</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

\[ SD = 0.15 \quad Mean = 0.42 \quad Max = 0.85 \quad Min = 0.07 \]

Table 3: Results from estimating logit model to determine recreational value of Saint Stepanus church

<table>
<thead>
<tr>
<th>First step</th>
<th>Second step</th>
</tr>
</thead>
<tbody>
<tr>
<td>variables</td>
<td>Amount of estimated coefficients</td>
</tr>
<tr>
<td>Y: intercept</td>
<td>3.40</td>
</tr>
<tr>
<td>Age</td>
<td>-0.028</td>
</tr>
<tr>
<td>sexuality</td>
<td>0.618</td>
</tr>
<tr>
<td>Education level</td>
<td>0.027</td>
</tr>
<tr>
<td>Family size</td>
<td>-0.054</td>
</tr>
<tr>
<td>Income</td>
<td>0.00084</td>
</tr>
<tr>
<td>Proposed price</td>
<td>-0.008</td>
</tr>
<tr>
<td>Church's welfare facility state</td>
<td>2.15</td>
</tr>
</tbody>
</table>

Estrella R^2 = 0.19 McFadden = 0.17  
SIC= 1.07 AIC = 0.98 N=317  
log likelihood function = -298.61

\[ \text{Estrella R}^2 = 0.185 \quad \text{McFadden} = 0.16 \]
\[ \text{SIC} = 1.007 \quad \text{AIC} = 0.97 N=317 \]

* and ** are being significant in 1% and 5% levels, respectively.

As it is clear from Table 3, results from estimating Logit model have been shown in two steps:

**Steps:** At the first step all of the independent variables and at the second step only significant variables at the first step i.e. age, sexuality, state of welfare facilities of Saint Stepanus Church and proposed price for fitting the Logit model have been used and all of the aforesaid four variables are significant at 1% level. The amount of estimated coefficient for variables of age and proposed price shows that together with one-unit increase in age and proposed price and assuming that other factors are constant, the acceptance probability of WTP of visitors will be decreased 0.036 and 0.0083 units, respectively. The amount of estimated coefficient of the church’s welfare facility state variable shows that due to the improvement in church’s welfare facilities and consequently, due to the increase in visitors’ satisfaction the acceptance probability of WTP of visitor is 2.11 units increased.
Table 4: Results from estimation of Heckman two-stage method

<table>
<thead>
<tr>
<th>Variables</th>
<th>The first stage (Probit)</th>
<th>The second stage (linear regression)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The amount of coefficient (statistic t)</td>
<td>Weighted aggregate elasticity</td>
</tr>
<tr>
<td>Y-intercept</td>
<td>0.47</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(1.34)</td>
<td>-</td>
</tr>
<tr>
<td>The amount of</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>visitors' satisfaction</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Education level</td>
<td>-0.032</td>
<td>-0.168</td>
</tr>
<tr>
<td></td>
<td>(−1.89)***</td>
<td></td>
</tr>
<tr>
<td>Family size</td>
<td>-0.081</td>
<td>-0.164</td>
</tr>
<tr>
<td></td>
<td>(−1.75)***</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>-0.00091</td>
<td>0.198</td>
</tr>
<tr>
<td></td>
<td>(2.03)**</td>
<td></td>
</tr>
<tr>
<td>Sexuality</td>
<td>0.439</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2.88)∗</td>
<td>0.125</td>
</tr>
<tr>
<td>Inverse of Mill’s Ratio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of Right</td>
<td>71%</td>
<td></td>
</tr>
<tr>
<td>Predictions</td>
<td>R² = 36%</td>
<td></td>
</tr>
<tr>
<td>Likelihood Ratio Test</td>
<td>14.9781 P-value=0.00475</td>
<td></td>
</tr>
<tr>
<td>Cragg-Uhler R²</td>
<td>64% McFadden R² = 37%</td>
<td></td>
</tr>
<tr>
<td>N=317</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*, ** and *** are being significant at 1%, 5% and 10% levels.

The amount of estimated coefficient of sexuality dummy variable shows that in case of its change from 0 (femaleness) into 1 (maleness) the acceptance probability of WTP of visitor is 0.56 units increased. Using Logit model, the mean WTP of visitors was gained as 4030 rials. The church's recreational total value was also obtained using the relation 15:

Recreational Total value of Saint Stephanus Church - the number of annual visitors × WTP (13) mean Recreational Total value of Saint Stephanus Church = 80,000 × 4030 = 3224,000000 rials

Results from the first stage of Heckman method (Probit model) expresses factors effective in probability of WTP of visitor and results from the second stage of this method (linear regression method) shows factors effective in the amount of WTP of visitor. As it is clear from table 4, independent variables used in Probit model include visitor's income, education level, family size and sexuality. In order to study the collinearity or its lack in estimated models variance decomposition analysis was used. Results from the test showed that there weren't any collinearity among the descriptive variables used in models. In order to study the inconsistency variance or its lack in Logit and Probit models, David Sen and Mackinon [35] offered an statistic under the title of LM2 which is based upon the LM method. The amount of LM2 statistic in fitted model is 6.23 and since probability value of this statistic is 0.57, assumption of existance of consistency variance in the model is accepted [36]. The amount of likelihood ratio statistic (LR) within the free degree of 4 is 14.97 and since this amount is higher than the amount of the offered probability value (P-Value), the whole estimated regression model is significant at level of 1%. Percentage of right prediction of the estimated model is 71% and since the minimum acceptable amount of this statistic, for Logit and Probit models is 70%, percentage of right prediction obtained in this model shows a desirable figure. Therefore, the above model is reliable for the future analysis. The amounts of Cragg-Uhler, R-Square and McFadden R-Square for estimated Probit model are 64% and 37% respectively. Regarding the number of dependent variable observation, these amounts are desirable figures. Weighted aggregate elasticity for visitor's income descriptive variable shows that assuming that other factors are constant, about 1% increase in visitor's income, causes 0.198% increase in acceptance probability of WTP. Also, the marginal effect, related to this variable showed that in case of fixedness of other factors, one unit increase in visitor's income, leads to 0.00032% increase in probability of WTP of visitor. Total weighted elasticity of independent variables of education level and family size show 0.168% and 0.164% decrease in
the amount of WTP and consequently, show 1% increase in education level and family size - assuming the fixedness of other factors. Also, marginal effect of these two variables shows that assuming the fixedness of other factors, one unit increase in the number of years of study and family size causes 0.011% and 0.028% reduction in the probability of WTP of visitors. Negative relation between the amount of studies and the amount of WTP of visitors results from the weak state of facilities in this church (43 percent of visitors expressed the weak state concerning the welfare facilities of the church), so that being aware of the church’s welfare facility state, they are not willing to pay high prices. The amount of marginal effect of sexuality virtual variable shows that due to its change from 0 (femailness) into 1 (malienness) the probability of WTP of visitors is 0.157 percent increased. The amount of estimated coefficient for each one of the above said variables together with their significance levels are shown in table 4 and it is clear from the table that all of the four variables in Probit model are significant. Independent variables used in linear regression model include visitor's income, family size, level of education, age and the variable of amount of visitor satisfaction. Linear regression model was estimated in the forms of linear and logarithmic functions and results from the non-nested testing showed that the model was linearly selected and results from estimation of this model is also shown in table 3. Determination coefficient related to linear regression shows 36% of changes in mean amount of WTP by the set of aforesaid independent variables.

The amount of statistic F is 29.19 which, regarding the probability value shows total significance of fitted regression at 1% level. Also, the amount of Durbin Watson (DW) statistic shows lack of Autoregressive in estimated regression. Therefore, considered model is reliable for analysis of the next results. The amount of estimated coefficient for income variable shows that one unit increase in average amount of visitor's income, assuming the fixedness of other factors, will cause 0.00029 unit increase in the WTP mean of visitors. The amount of estimated coefficient of visitors' satisfaction amount variable was 152.95 which indicates that due to improvement in church's welfare facilities and due to increase in visitors' satisfaction, mean WTP of visitors will 152.95 units be increased. The amount of estimated coefficient of variables family size, age and education levels show that, in case of fixedness of other factors, one unit increase in the amount of mean of above said variables, will be lead to 57, 6.15 and 13.4 units decrease in visitors’ WTP mean respectively. That, Inverse of Mill's Ratio is significant at 1% level shows that factors effective in decision making about WTP are not identical with factors determining the amount of WTP and this, confirms using Heckman two-stage method. On the basis of results from linear regression model WTP mean of visitors to visit Saint Stepanos Church came from relation 16:

$$WTP = -7.99 \times (6.15 \times 4.0) + (3.4 \times 10) - (57 \times 3.94) + (0.00029 \times 4390000) + (15295 \times 1.17) + (415 \times 0.000000014) = 4800$$  

(14)

- Recreational total value of Saint Stepanos Church is also comes from, stated above, relation 9:
- Recreational total value of Saint Stepanos Church - number of annual Visitors \times WTP mean
- Recreational total value of Saint Stepanos Church = 80000 \times 4800 = 384000000 rials

Results from the research show that people are content to pay some amount for taking the advantages of this archaeological site, so that, 68% of under study visitors, are prepared to pay some amount for taking recreational advantages of Saint Stepanos Church.

CONCLUSION AND SUGGESTIONS

Results from the research show that available welfare facilities of Saint Stepanos Church for tourism attraction is somewhat appropriate, so that 68% of visitors are prepared to pay some amount to visit Saint Stepanos Church. WTP mean of visitors, using CV and Heckman two-stage methods are 4030 and 4800 rials, respectively and annual recreational value of Saint Stepanos Church, using the above said methods, were estimated about 322 and 384 million rials, respectively. That, Inverse of Mill’s Ratio is significant at 1% level, shows that factors effective in making decisions about WTP are not identical with factors which determine the amount of WTP and this, confirms using Heckman two-stage method. Regarding the high potential of this church in tourist attraction and high importance that tourists grant for visiting archaeological sites such as churches, it can be said that in case of improvement in available welfare facilities in this church, the number of tourists will considerably be increased. So, it is necessary for planners and authorities to pay much attention to these archaeological sites in order to develop the tourism and increase the number of tourists and due to the expanding and creating suitable welfare hygienic facilities for families in different tourism sites help to develop the visitor's welfare. Also, it is necessary for related authorities to pay much attention to policies of tourism and promenade activities together with
observing the environmental standards and creating some mechanisms for revenue from ecotourism, to be returned, to local societies. It is also considerable that, foreign tourist attraction without preparing the tourism substructures of electronic is considered as impossible. So, in information communication dimension offering a complete map about each one of tourism regions with all details on a defined site is necessary. This site should be so that in which all of the service giving sites have been defined and the tourist can follow all tracks through the site and resolve his needs.

REFERENCES