Economic Valuation Of Living Heritage Conservation In Melaka City, Malaysia Using Choice Experiment.

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Review of Integrative Business & Economics Research

ABSTRACT

Melaka living heritage is a unique living testimony to the multi-cultural heritage and tradition of Asia, recognized by UNESCO as World Heritage Site in year 2008. The city is currently facing threats of high traffic, excessive depletion of the natural environment in the city. The aim of this study is to estimate the economic benefit of living heritage in Melaka city. The results would be able to provide insights to the value of this unique heritage to the society. Choice Experiment (CE) was used with four distinguished attributes of the city identified; living heritage, natural environment, crowded recreational activities and heritage charge value. A total of 502 respondents were interviewed; indicating the attribute for crowded recreational activities in the city provides the highest probability for the respondents to pay for an improvement level. Living heritage attribute has a negative probability of the respondents paying for a higher level.

Keywords: Choice Experiment (CE), living heritage, natural environment, crowded recreational activities.

1.0 INTRODUCTION

Living heritage provides a sense of belonging and identity to a community and promotes respect for cultural diversity and human creativity. Living heritage in this study covers the information of a practicing community about who they are and how their past that has formed them. It can be defined as a collection of practices, traditions, expressions, skills, buildings, architecture structure and knowledge that are passed from one generation to the next. (UNESCO, 2007). Melaka city is the capital city of the state of Melaka, in Malaysia. Melaka city has been listed as a UNESCO World Heritage Site together with Georgetown of Penang on 7 July 2008. The status greatly uplifted Melaka as a renowned tourist destination in the world.

Malaysia has recognized the importance of living heritage conservation and Malaysia government has emphasized heavily on the living heritage conservation in the country. Despite the great opportunities for conserving the living heritage in Melaka, the city is

ISSN: 2304-1013 (Online); 2304-1269 (CDROM)

currently facing threats of high traffic, excessive depletion of the natural environment in the city. This is due to underestimation on the non-market values of living heritage in development decisions.

Introducing a new scheme or improvement may sometimes bring negative effects to a place that is already very special and unique. Nevertheless, changes are inevitable and will occur in any place but these changes should be well-managed so that the physical and non-physical entities that had shaped the particular place must be maintained from the process of change itself. Melaka faced challenges in preserving its heritage due to the lack of legislation to protect Melaka as a place of heritage significance.

1.1 Research Problem

Melaka city has been listed as a UNESCO World Heritage Site on 7 July 2008. This privileged status greatly uplifted Melaka as a renowned tourism destination in Malaysia. There has been a tremendous increase and high visitors' traffic to the historical city due to all the recognition given to Melaka lately and there is an urgent need to upkeep Melaka city, in order to fulfill the UNESCO World Heritage Site criteria; otherwise this prestige title would be revoked. The maintenance cost in Melaka city increases due to the increasing number of tourists visiting the historic city. Living heritage is an irreversible loss, which should be conserved as it brings a sense of belonging and the origin of a nation. There are many competing and important projects that will need federal government funding. Therefore, the qualification of government projects in monetary terms allows policy-makers to prioritize conservation programs and projects with limited and tight budgets. Proper conservation guidelines and implementation could slow down the deterioration of living heritage so that present and future generations would be able to enjoy these unique heritage. There are only a few historical sites in the world that can claim to be a "living heritage" city. Melaka city proudly claimed to be one of the heritage site in the world after being acknowledged by the UNESCO as World Heritage Site in 2008.

1.2 The research objectives

The objective of this study is to estimate the economic value of conserving the living heritage in Melaka city. This research is a study on the benefits of conserving living heritage, particularly in Melaka city. Benefits refer to the customs and sense of identity for a nation as well as tourism revenue for a country. This study used non-market valuation technique to measure the benefits of living heritage, which has not been widely done in the past studies. Although there have been studies, applying non-market valuation techniques to the conservation of natural resources, there have

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been relatively few studies on the application of this technique in conserving cultural heritage (Pearce et al. 2002). Among the past studies on valuation of cultural assets, they vary widely on the goods, activities and benefits that are being studied. Few studies have taken place on the economic value of cultural heritage sites despite the debate over their value to the society. Other than that, this study can provide insights to the policy makers to introduce appropriate conservation policies and tourism programmes.

2.0 LITERATURE REVIEW

Heritage constitutes a legacy to be passed on to future generations (bequest value). According to Throsby (2006), heritage is something inherited from the past and by putting the adjective "cultural" to it defines its scope in a more precise manner. Heritage includes different forms of cultural capital "which embodies the community's value of its social, historical, or cultural dimension" (Throsby, 1997). Heritage experts tend to regard economists as being insensitive and focused too much on the financial measurement, tend to overlook the true cultural significance of heritage assets (Cannon-Brookes, 1996). In the case of public goods, when market fails, it is the consumers' willingness-to-pay that expresses the value of the goods in question. The economic values of heritage are values that individuals recognized and prepared to pay for in one way or another (Hutter et al. 1997; Rizzo and Throsby, 2006).

According to Choi et al. (2009), the interest of valuation is estimating the total economic value, which includes not only use values (for example activities and services) but also intangible non-use values (for example existence, bequest and altruistic values) which were not normally captured in the private market transactions. Total economic value can be estimated using stated preference non-market valuation techniques (Bateman et al. 2002; Bennett and Blamey, 2001; Hensher et al. 2005; Noonan, 2003). When reliable market data are not available, researchers may need to create a hypothetical market to elicit consumers' preferences. According to Sable and Kling, 2001; Throsby, 2001, cultural heritage sites often provide a variety of public contributions such as symbolic cultural items, historical value, social value, aesthetic value, spiritual value, educational value and shared experience. These are public goods, and their economic values are not easily determined from transactions in actual markets.

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In Bateman et al. (2002) study, he mentioned that stated preferences techniques were used on the event that required WTP information that cannot be obtained from the markets. It is relevant to the case of living heritage of Melaka city because there is no market exists for the benefit of conserving the living heritage. The total economic value of the cultural asset is the sum of the use and non-use values associated with the cultural asset. Refer to Figure 2.1 for the illustration on the types of values that sum up the total economic value.

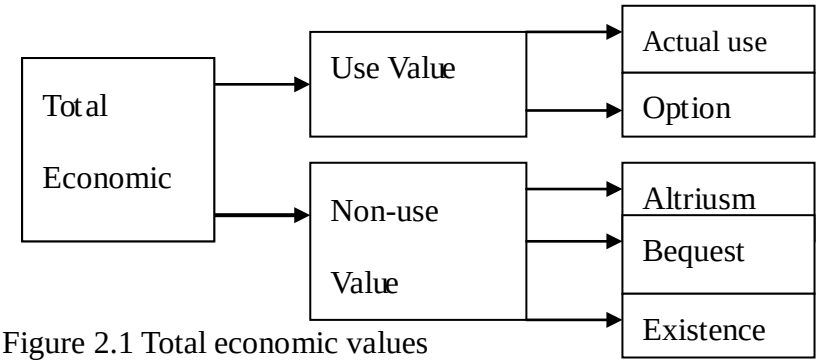

Figure 2.1 Total economic values
(Adapted: Choi et al. 2009)

Cultural heritage gives rise to both direct and indirect use values. Basic economic theory informs us that the consumer's surplus is the measure of net benefit to the consumer of buying a certain quantity of a good at the market price. WTP measures the gross change in well-being (or welfare, or utility) from a particular change in the quantity of the good.

2.1 Choice Experiment

CE involves designing different options with different levels of attributes and characteristics. The respondents were then asked to choose their preferred options

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based on the given options in the surveys. A "status quo" term is always used as a baseline in the questionnaire in order to achieve welfare measure that is consistent with the economic theory (Adamowicz et al. 1998; Layton and Brown, 1998). The key element in using CE method is its capability in valuing different attributes of natural environment (Hensher et al. 2005; Louviere et al. 2000). According to Christie et al. (1999) and Bullock et al. (1998), CE has been widely used to estimate the value of different environmental goods including recreation, biodiversity and landscapes respectively.

In CE, respondents were presented with panels of choice sets with two or three alternatives, each alternative has different group of attributes which are specified in different levels. Another advantage of CE over CVM-DC is its ability to estimate and report the rate of trade off or substitution value between monetary and non-monetary attributes. Due to the greater flexibility provided by this approach, it is a potentially more efficient tool in terms of policy analysis of application for non-market valuation (Rolfe et al. 2000).

3.0 METHODOLOGY

In order to obtain the aggregate value of the WTP, a sample is selected from the population and asked to answer to a series of questions about their WTP with the purpose to gain their perception about avoiding or accepting hypothetical changes in the quality of a heritage resource. The conceptual framework for this study is shown in Figure 2. Based on the framework, the evaluation process involves three standard steps for CE (Barbier et al. 1997). The common steps are as follows:

- Defining the problem and selecting the appropriate method in economic valuation that will help to solve the problem of the study.
- Defining the scope, opportunities and limits of the selected approach and the required information for the selected valuation approach.
- Defining data collection methods for the selected valuation techniques based on the nature of goods and services.

3.1 Conceptual Framework

Based on the conceptual framework in Figure 3.1, all the three steps of the analysis above should provide an economic valuation of the living heritage that will indicate to the policy makers the importance of conserving living heritage in the state. The choice modelling requires the help of experts to identify the most important attributes and its levels. These values include natural environment, living heritage and crowded recreational activities. Valuing each of this attributes separately at a different quality

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level can be obtained only through CE approach. Furthermore, average value of all attributes or all non-market goods provided by the living heritage can be estimated using the CVM. Data aggregations will provide us the main objective in estimating the total economic value of the benefits of the living heritage in Melaka city.

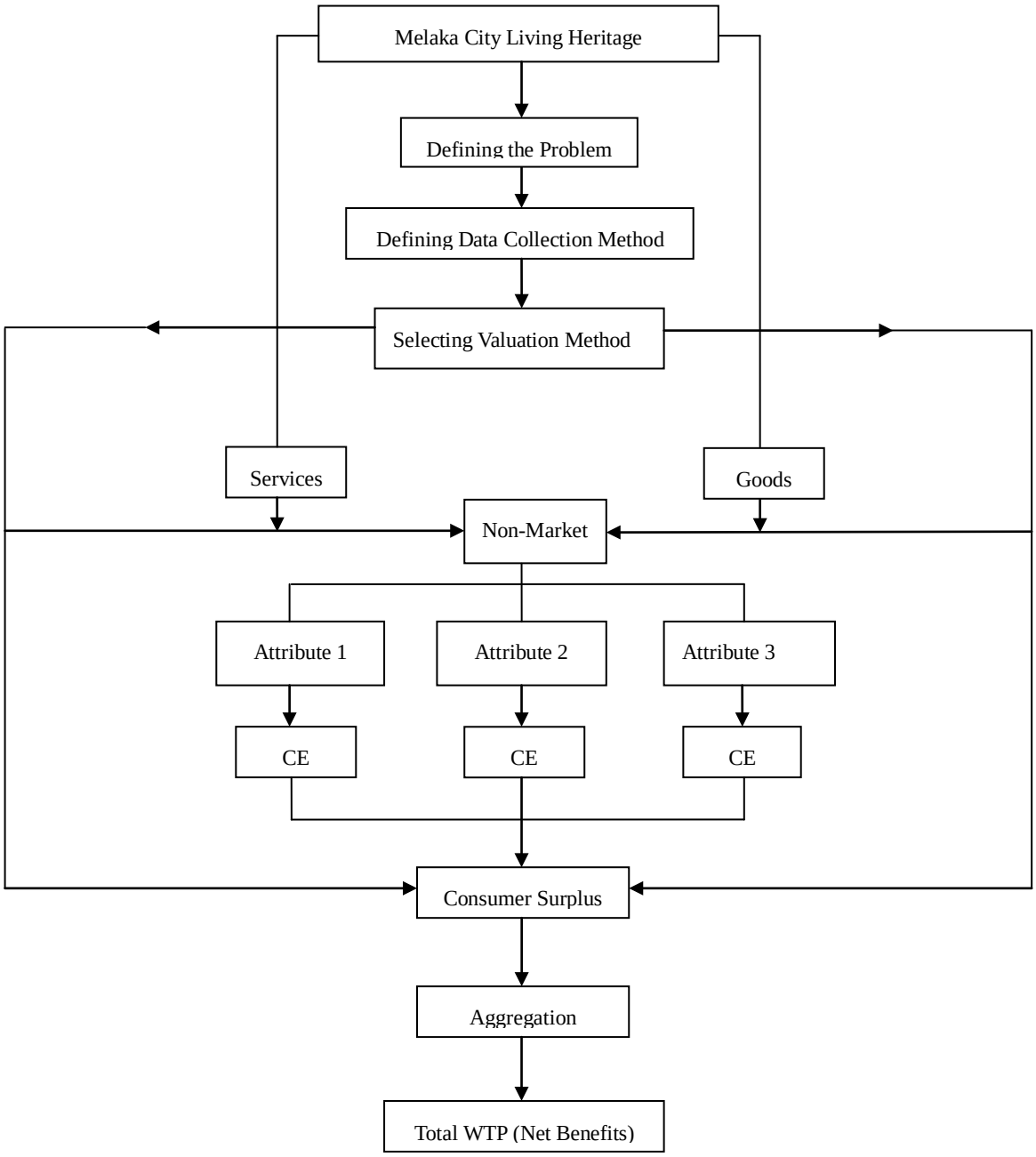

Figure 3.1 Conceptual framework of the study.

A total of 502 respondents were interviewed based on the total hotel guests of Melaka 3,906,701 with 95% confidence level. This sample size fulfilled the minimum required 500 respondents in the logit model as in Mitchell and Carson (1989) study. The accommodations were selected randomly based on stratified sampling in this

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study. A total of 502 respondents were picked conveniently in various types of accommodations in Melaka (Budget Inn to 5-star hotels in Melaka).

3.2 Choice Experiment (CE) Methodology

The theory of consumer behavior is the maximization of a utility function subject to a budget constraint. CE approach uses both random utility (Thurstone, 1927; McFadden, 1974; Manski, 1977) and the characteristics theory of value (Lancaster, 1966) to provide utility theoretic interpretation of the discrete respond derived from the respondents.

The principal of random utility theory, is that the unobservable, can be divided into the deterministic (or objective) and random components. The hypothesis of the individual choices is based on the characteristics of goods together with some degree of randomness. The individuals know their utility function, but due to the unmeasured attributes of the goods being valued, the random component can be attributed to the element of randomness in the preferences of the individual. The other fact is that this study may not have the complete information from respondents because of unobserved components of the utility function. The individual utility function (for individual *i*), where he or she faced a set of N alternatives (j= 1…N) can be specified as:

$$U_{ij} = V_{ij} + \varepsilon_{ij} \tag{3.2}$$

where U_{ij} is the utility individual i obtain from alternative set j, V_{ij} is a non-stochastic utility function and ε_{ij} is a random component. This function can also be expressed by decomposing the indirect function for each respondent I (U) into two parts: a deterministic element (V), which would typically be specified as a linear index of the attributes (X) of the jth alternative in the choice set, and a stochastic element (e) which represents the error term:

$$U_{ij} = V_{ij}(X_{ij}) + \varepsilon_{ij} = bXij + \varepsilon_{ij} \tag{3.2.1}$$

Imagine an individual is asked to choose between two alternative choice sets, which are assumed to be differentiated by their attributes and levels. For example, in this study, the two different choice sets of living heritage conservation, with different attributes such as natural environment quality and the level of crowded recreational activities levels. Assume these choice sets are j and k. In choosing between them, the

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respondent is assumed to compare the utility he or she could get with either choice, and then select the preferred choice set with the highest utility. Respondents are also asked to make a choice from the offered ones and assumed that it is the only available choice.

Predictions cannot be estimated easily when the view point that an error component is used in the utility function and it become one of the probabilistic choice. The probability that any particular respondent, *i*, prefers option j in the choice set to any alternative if $U_{ij} \succ U_{ik}$. We assume that this utility is only known to this particular *i* and that the utility associated with option j exceeds that associated with all other options:

$$P_{ij} = \left(V_{ij} + \varepsilon_{ij}\right) \succ \left(V_{ik} + \varepsilon_{ik}\right)$$

$$= P\left[\left(V_{ij} - V_{ik}\right) \succ \left(\varepsilon_{ij} - \varepsilon_{ik}\right)\right] \qquad (3.2.2)$$

Due to the above function, we can express that the probability of choosing alternative j to alternative k as the differences between the deterministic parts of their utility and error parts. If the error terms are assumed to be independently and identically distributed (IID), and if the Gumbel distribution can be assumed, these errors can be expressed as the logistic distribution (McFadden, 1993). The probability of choosing option j by *i* will take the following:

$$P_{ij} = \frac{\exp\left(\mu V_{ij}\right)}{\sum_{j}^{i} \exp\left(\mu V_{ik}\right)} \qquad (3.2.3)$$

According to Blamey et al. (2001), the assumption of independent and identically distributed error terms implies independence of irrelevant attributes (IIA). It means that the ratio of choice probabilities for any two alternatives is unchanged by addition or removal of other unchosen alternatives. The term "μ" is a scale parameter, a convenient value chosen that will not affect valuation results if the marginal utility of income is assumed to be linear.

A study by Yacob and Shuib (2009), it is assumed the vector V_{ij} is linear, and the utility function of the respondents' components can be written as:

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$$V_{ij} = \beta_1 X_{1ij} + \beta_2 X_{2ij} + ... + \beta_n X_{nij} \quad (3.2.4)$$

where X is the variable in the utility function, β is the coefficient of the estimates. A single vector of coefficient β applies to the associated utility functions and the scale parameter "μ"can be assumed to be equal to 1. We can then rewrite the equation as:

$$P_{ij} = \frac{\exp(\beta V_{ij})}{\sum_j^i \exp(\beta V_{ik})} \quad (3.2.5)$$

where: P_{ij} = probability of respondent *i* choice of alternative j ; X_{ij} and X_{ik} = vectors of attributes ; β = vector of coefficient.

The econometrics software LIMDEP was used in estimating the logit and the conditional logit model by conventional maximum likelihood procedure:

$$\log L = \sum_{i=1}^{N} \sum_{j=1}^{J} Y_{ij} \log \left[\frac{\exp(V_{ij})}{\sum_{j=1}^{J} \exp(V_{ik})} \right] \quad (3.2.6)$$

where: Y_{ij} is an indicator which takes the value of one if respondent *i* chooses option j and zero otherwise and N is the number of sample.

The last step in CE is to estimate the WTP value based on the estimated β values from equation 3.2.4. The estimates β value, which implies the effect on the utility of a change in each attributes level. For example, β_1 shows the effect on utility of a change in attribute X_1 (Hanley and Barbier, 2010).

WTP is the price or cost attribute and the marginal change in an attribute is typically derived by dividing the β_{x_1} value of each non-monetary attribute by β_c value of the price attribute. $MWTP = \frac{\beta_{x_1}}{\beta_c}$, this value for any attributes, other than the price is called the implicit price or marginal rate of substitution (MRS), (Hanley and Barbier, 2010).

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4.0 ANALYSIS AND DISCUSSIONS

Socio-economic Profile of Respondents

A summary of the socio-economic profile of respondents is presented in Table 4.1. The total number of respondents is 502. The respondents' age is between 18 years old to 72 years old, with a mean of 25 years old.

Table 4.1. Socio-economic Profile of the Respondents

Variable	Frequency		Mean
	Number	%	
Age (year)			24.705
Income per annum			30863.55
Gender			
Male	221	44.1	
Female	281	55.9	
Race			
Malay	123	24.5	
Chinese	315	62.8	
Indian	46	9.1	
Others	18	3.6	
Marital Status			
Single	263	52.4	
Married	236	47	
Others	3	0.6	
Education level			
Secondary	52	10.3	
Certificate/Diploma	179	35.7	
Degree/Masters	271	54	

The distributions of the sampled respondents' gender are 44.1% and 55.9% male and female respectively. Most of the respondents are are Chinese with 62.5%, 24.5% are Malay, 9.1% are Indians and 3.6% are others (eg. Punjab, Sabahan, Sarawakian). Meanwhile, 10.3% of the respondents had completed their secondary school, 35.7% with a diploma certificate and 54% of them had degree/master certificate. As for the marital status, 52.4% of them are currently single, 47% of them are married and 0.6% of them are widowed.

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The analysis will start with basic model followed by the interaction models. At the end, the best model is selected based on the expected signs and significant of main attributes of the model. Table 4.2 shows a brief descriptive analysis of the main attributes in the choice experiment.

Table 4.2 Descriptive analysis of main attributes

Variable	Frequency (%)	Expected Sign
NE (Natural Environment)		
Satisfactory	28.05	+
Less Satisfactory	28.52	
Not Satisfactory	43.43	
Living Heritage(LH)		
Very satisfactory	24.86	
Satisfactory	25.66	+
Less Satisfactory	49.48	
Crowded Recreational activities (CONG)		
No crowd	38.2	
Lesser crowd	24.19	+
Some crowd	37.61	
CV(Conservation Value)		
RM2	10.64	–
RM5	45.26	
RM7.50	23.94	
RM10	20.16	

Different options were presented to respondents, distinguished by their attributes and associated cost. Option A and Option B entailed various combinations of conservation attributes with nightly cost to the visitors, while Option C is always weak conservation (current situation) and therefore with the minimum cost of RM2. The general econometric model was derived as below:

$U = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + ... + \varepsilon_0$

where $\beta_1, \beta_2, \beta_3 ... \beta_k$ are related coefficients on the main attributes $X_1, X_{2_k} ... X_k$.

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4.1 Basic Multinomial Model

For basic model, only main attributes were applied. The respondents were expected to value those levels of natural environment, living heritage and crowded recreational activities that resulted in higher quality and bring higher utility. Table 4.3 shows the basic multinomial logit model with signs of all the attributes.

Table 4.3 Basic Multinomial Model

Variables	Coeff (β)	Std.Error
NE	0.73012876	0.04264956***
LH	0.42478155	0.03948460***
CONG	0.57466161	0.03140176***
PRICE	-0.09964683	0.01256524***
Log likelihood function = -2387.751		
Log-l fncn coefficients= -2381.0708		
R-sqrd= 0.281		
RsqAdj = 0.361		

***Significant at 1%, ** 5% and *10%

Table 4.3 shows that all the attributes sign are in agreement with the theories. Natural Environment (NE), Living Heritage (LH) and Crowded Recreational Activities (CONG) are positive in sign refers to higher quality of these attributes the higher the willingness to pay. Meanwhile, negative sign for price shows that the higher the conservation value, the lower the willingness to pay. Several approaches to improve the model fit and estimating models, which are more accurate. Each attribute, except conservation value in term of monetary value (CV) is divided into three levels and recoded as dummy variables (0, 1). Status quo or level one as base line and level two and three implied medium and high level of each attribute. Attribute levels are dummy coded which means that they are set to 1 if the corresponding level is present, and equal to 0 otherwise (Table 4.4). In all models, base level is the first level of each attribute.

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Table 4.4 Attributes and Attribute Levels

Attribute	Attribute Level	Description
NE (Natural Environment)	NE1	1= Natural environment is not satisfactory 0=otherwise
	NE2	1= Natural environment is less satisfactory 0=otherwise
	NE3	1= Natural environment is satisfactory 0= otherwise
LH(Living Heritage)	LH1	1= Living heritage is less satisfactory 0=otherwise
	LH2	1= Living heritage is satisfactory 0=otherwise
	LH3	1= Living heritage is very satisfactory 0=otherwise
CONG(Crowded Recreational Activities)	CONG1	1= Some crowd for recreational activities 0=otherwise
	CONG2	1= Lesser crowd for recreational activities 0=otherwise
	CONG3	1= No crowd for recreational activities 0=otherwise

4.2 Simple Multinomial Model (MNL)

For the simple multinomial model, only main attributes are applied. Table 4.5 shows the basic multinomial logit model. All coefficients have the expected a priori sign and are highly statistically significant. The sign for all the attributes are positive. All the variables are significant at 1% level and less, with correct expected sign. Price is significant at 1% with an expected negative sign. It means as conservation price increases, respondents are less likely to contribute because of the decrease in the utility level.

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Table 4.5 Simple Multinomial Logit Model

Variable	Coefficient	Std. Err
NE2	1.24659531	0.07665319***
NE3	1.27422701	0.12314200***
LH2	0.77041232	0.07937705***
LH3	0.50544183	0.08578919***
CONG2	0.62320528	0.11292712***
CONG3	1.43015147	0.11294923***
PRICE	-0.10833869	0.01564213***
Log likelihood function = -2320.732		
Log-l fncn coefficients= -2381.0708		
R-sqrd= 0.2534		
RsqAdj = 0.2398		

***Significant at 1%, ** 5% and *10%

4.3 Marginal willingness-to-pay

The marginal willingness-to-pay (WTP) is calculated by computing the marginal rate of substitution between the attribute of interest and the cost factor..According to Hanley & Barbier (2009), this value ratio can also be identified between non-monetary elements of utility (attribute tradeoffs) is known as implicit price (IP). As an example, one of the attribute is natural environment dividing the β value of this attribute by β value of price, would show the average willingness-to-pay of respondents to increase the quality of natural environment from the current level. The marginal value of the conservation attributes is estimated using the following formula:

$$MV = -\beta_{attribute} / \beta_{monetary\ variable}$$

Wald procedure in LIMDEP, NLogit 4.0, was employed to estimate the WTP value of the attributes. The results is reported in Table 4.6 depicts that, acceptable crowd for recreational activities has the highest marginal value and all medium and high level of attributes had positive signs indicating in increasing utility as the level attribute levels improves. In this study, it is expected that the respondents valued those level of natural environment and crowded recreational activities that results in higher quality and bring higher utility. Nevertheless, the living heritage results lower marginal value from LH2 (7.11) to LH3 (4.66). This may be due to the fact that living heritage covers

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cultural traditions, customs and the condition of the buildings which is subjective, difficult to measure and not easy to differentiate between different quality levels for this attribute.

Table 4.6 Simple multinomial logit model marginal value for different attribute levels

Variables	Marginal Value	Std.Err
NE2	11.5064642	1.63505617***
NE3	11.7615135	1.50245622***
LH2	7.11114643	1.22343202***
LH3	4.66538605	0.81297655***
CONG2	5.75237945	0.74814242***
CONG3	13.2007449	2.07267003***
Wald Statistics = 130.50220		
Prob.from Chi-squared [6] = 0.00000		

***Significant at 1%, ** 5% and * 10%

5.0 CONCLUSION

Although living heritage is highly valued by residents and visitors, estimating the real value and benefits received from this living heritage are difficult, subjective and complex. As a result, non-market benefits are typically underestimated and the costs of the living heritage appear to outweigh its benefits. This is a sign of "market failure" and it is a serious shortcoming for public goods. One of the arguments is that the environmental conservation management and policies should reflect the real value of heritage even to the international societies as well. Therefore, the decision must be developed in a way that realistically provides an opportunity for all.

There are strong opinions that this living heritage is important due to the diversity of social, economic and environmental benefits arising from Melaka city's living heritage. In the CE scenario, multinomial logit models were employed to derive the marginal value and compensating surplus of the respondents for four attributes of non-market values of living heritage in Melaka city. These attributes were natural environment, crowded recreational activities, living heritage and price. The preliminary and final models were discussed in the earlier section and interaction models were derived and discussed as well. The results showed that interaction models have more accuracy than basic model. The interaction term was socio-economic profile of the respondents with the main attributes. The results

ISSN: 2304-1013 (Online); 2304-1269 (CDROM)

indicated that the respondents have positive WTP for all the attributes. Meanwhile, the price attribute was statistically significant in the CE estimation.

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