Analysis

Valuing marine turtle conservation: A cross-country study in Asian cities

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ABSTRACT

The prime objective of this paper is to estimate from a cross-country perspective the willingness to pay for marine turtle conservation using the contingent valuation method. A secondary objective is to investigate two methodological issues about contingent valuation study: scope effect and payment vehicle effect. Using a uniform survey instrument and protocol, a sample of 3680 respondents from Beijing (China), Davao City (Philippines), Bangkok (Thailand) and Ho Chi Minh/Hanoi (Vietnam) were interviewed. Results indicate that the respondents in all cities have a positive willingness to pay for marine turtle conservation. The type of scope effect and payment vehicle effect considered did not seem to be significant in Beijing, Davao City and Bangkok. But some evidence show that there are scope effect and payment vehicle effect in Ho Chi Minh/ Hanoi sample. Our study offers practical insights into Asian household preferences for marine turtle conservation.

1. Introduction

The marine turtle is an important species, not only for their economic and intrinsic value, but because their presence is often an indicator of healthy marine ecosystem. However, despite their valuable roles, marine turtles face a wide-range of threats (Perrine, 2003). As a result, all species of marine turtles are listed by the IUCN as being endangered, and the Hawksbill (*Eretmochelys inbracat*) and Leatherback (*Dermochelys coricea*) are listed as critically endangered (IUCN, 2007). Positive human action is required to ensure the survival of most species of marine turtles.

The marine turtle is a migratory species. Their habitat is shared among a large number of countries such as China, the Philippines, Thailand, Vietnam and Indonesia. Coordinated policies to conserve marine turtles are thus more likely to be effective than those pursued by countries on their own. Some progress has already been made (Smith, 2008). However, international collaborations remain sparse in scope and in length. Lack of coordination between different governments, failure to consider fully economic aspects and evaluate public preferences for marine turtle conservation has contributed to a continuous decline of marine turtle populations.

The preservation of animals requires protection of the individual species and also conservation of the habitats in which they live. The costs of such conservation to society can generally be easily measured (Chambers and Whitehead, 2003). In order to determine the economic efficiency of specific protection programs, it is necessary to compare these costs with some estimate of the economic benefits of conservation. However, estimating the non-market benefits from endangered species conservation is not easy, given the market failure associated with the public good (Freeman, 2003).

The contingent valuation method (CVM) seeks to elicit the value that people attach to a species by asking them how much they would be willing to pay (Mitchell and Carson, 1989). Literature on using the CVM to estimate benefits of a specific endangered species is growing (e.g. Jackobsson and Dragun, 1996; Chambers and Whitehead, 2003; Bandara and Tisdell, 2004). However, to our best knowledge, there is no recent study that values the conservation of marine turtles on a cross-country scale using a single CVM survey instrument and common survey procedure.

The primary objective of this study is to estimate the economic benefits of marine turtle conservation using the CVM from a cross-country perspective. A uniform survey instrument and field protocols were used in five major cities in four Asian countries, specifically in Beijing (China), Davao City (Philippines), Bangkok (Thailand), Ho Chi Minh (HCM) City and Hanoi (Vietnam). The four countries surveyed form part of the migratory route of marine turtles where many major nesting sites and feeding grounds of marine turtles can be found.

Although CVM has become one of the most popular methods used by environmental and resource economists to value environmental goods, the technique remains controversial (e.g. Hausman, 1993;

Cummings and Harrison, 1994). There is a significant body of evidence to suggest that CV estimates do not exhibit great sensitivity to scope (Boyle et al., 1993; Foster and Mourato, 2003). With respect to a specific endangered species, how should funds be used to support their conservation be collected? Is mandatory payment superior to voluntary contribution? A secondary objective of this study is to carry out two methodological tests, focusing on payment vehicle effect and scope effect. Such tests are absent in the existing marine turtle valuation literature.

The rest of this paper is organized as follows. The second section presents the research design. Empirical results and discussion are presented in the third section. Finally, main conclusions are summarized.

2. Research Design

2.1. The Elicitation Format

The dichotomous choice (DC) question format was used to elicit the willingness to pay (WTP) of respondents. The DC approach was first employed by Bishop and Heberlein (1979) and is generally considered to be a superior elicitation method because of its incentive compatibility (Lee and Mjelde, 2007).

The bids used for the main survey were based on several pre-test results in each country. In the pre-test, five different bids were asked using the DC format. In the main survey, five bid levels were used for each country, three of which were common to all countries, i.e., US$ 0.02, US$ 1 and US$ 5. The bids finally used in the four countries are shown in Table 1.

2.2. Questionnaire Design

The survey questionnaire used in the field was based on several focus group discussions among the agencies involved, government officials, environmental experts, and some local residents. A series of pre-testing surveys were also conducted in all cities involved to further identify and correct potential problems. Several revisions were undertaken before the survey questionnaire was finalized.

2.2.1. Scope Test

Scope test involves observing changes in the WTP estimate as the quantity or quality of the good is made larger or smaller. This study was designed to use split samples to test the scope effect. Two conservation program scenarios were presented. One was a regional collaborative conservation program to protect the marine turtle in the four countries, and the other was a national conservation program to protect the marine turtle only within each country. The questionnaire contained exactly the same questions except that the two programs differed in the scope.

2.2.2. Payment Vehicle Test

Payment vehicle design is a crucial element in application of the CVM. To allow for a payment vehicle effect test, two possible payment vehicles based on pilot studies were used. The first was a monthly mandatory surcharge on households' electricity bills and the second was a voluntary surcharge on households' electricity bills every

month. The payment was limited in 5 years, which assumed that the collection in 5 years would be enough to conduct the conservation activities. The reason for choosing a surcharge on electricity bills as the payment vehicle was that almost all households in the four countries were paying electricity bills, which is most common compared to other payment vehicles. The questionnaire contained exactly the same questions except that the two programs differed in the payment schemes.

Based on our research design, we asked separate groups of respondents about their WTP for one of three marine turtle conservation scenarios: (i) a regional program financed through a mandatory surcharge, (ii) a regional program financed through voluntary contributions, and (iii) a national program financed through a mandatory surcharge. The respondents were randomly assigned to one of the packages. Each set of respondents was randomly divided into five groups, each of which was asked to give a yes-or-no response to one of the five bid levels in each country.

The final survey questionnaires mainly consisted of four interrelated sections, which were uniform in the four countries. The first section contained questions about respondents' general environmental attitudes, such as environmental awareness and perceptions of environmental issues. The second section was composed of questions about the respondent's knowledge of and attitude towards marine turtle conservation. The third section introduced a marine turtle conservation program and WTP questions as well as some debriefing questions (including reasons why respondents are or why they are not willing to pay). Cheap talks were also added to reduce potential hypothetical bias through an explicit discussion of the problem (Cummings and Taylor, 1999). Before the valuation question, we first described the hypothetical bias phenomenon and asked respondents to bear it in mind and answer as if they were in a real situation. The last section included a number of relevant questions regarding respondents and their households' socio-economic characteristics.

2.3. The Sample

The sample was selected from Beijing (China), Davao City (Philippines), Bangkok (Thailand), Ho Chi Minh (HCM) City and Hanoi (Vietnam). These cities were chosen based on the fact that residents of major cities are relatively more educated and hence more capable of responding to a CVM survey. The reason for choosing HCM and Hanoi in Vietnam is that it is believed that the preferences of people in the two cities are different and thus, they should be both included to make it representative for large cities in Vietnam.

The sample in each country was selected using the same multi-stage stratified random sampling procedure which is based on the city population statistics. The respondents randomly spread across all administrative districts in the survey cities. The respondents in each city were male or female household heads above 18 years old. The household head was identified as the person in charge of daily expenditures and other (younger) family members.

2.4. Survey Mode

In-person interviews are the method recommended by the NOAA panel for the administration of contingent valuation surveys (Arrow et al., 1993). However, for decisions involving unfamiliar and/or complex environmental policies, especially where non-use values are being sought such as marine turtle conservation in this study, personal interviews would appear to face some potentially serious limitations (Macmillan, et al., 2002). In this study, the drop-off survey method was chosen to give the respondent ample time to think (Whittington et al., 1992) on the valuation scenario and to elicit WTP response based on household decision (Harder, 2006). This involved personal delivery, personal follow-up and personal collection of the survey questionnaire (Subade, 2005).

Table 1
Bids used in the four countries.

Cities	Bids (US$)				
Beijing	**0.02**	0.5	**1**	**5**	7.5
Davao	**0.02**	0.1	**1**	2	**5**
Bangkok	**0.02**	0.25	**1**	2.5	**5**
HCM and Hanoi	**0.02**	0.5	**1**	**5**	7.5

Note: Numbers in bold are common bids.

3. Empirical Results and Discussion

In August and September 2005, a split sample survey using questionnaires with different scenarios was carried out in Beijing, Davao City, Bangkok, HCM City and Hanoi. Totally, about 1000, 1200, 1020 and 1805 households in Beijing, Davao City, Bangkok, HCM City and Hanoi were surveyed. The response rates were 62%, 71%, 77% and 80%, respectively.

After excluding questionnaires with incomplete, inconsistent or problematic answers to the key questions, 3680 observations were left (600, 847, 789, and 1,444 for Beijing, Davao City, Bangkok, HCM City and Hanoi). The usable sample for different scenarios is shown in Table 2. Respondents were classified into three sets: 1249 respondents responded to the regional program with a mandatory payment vehicle; 1220 to the regional program with a voluntary payment; and 1211 to the national program with a mandatory payment scheme.

3.1. Demographic Profile of Respondents

Table 3 displays the main socio-demographics of respondents. In terms of length of schooling and age of the respondents, the values are relatively comparable in all study sites. The samples in Davao and Ho Chi Minh/Hanoi had bigger household size than that in Beijing and Bangkok, implying higher household expenses. Further, the average income levels of Davao and Ho Chi Minh/Hanoi were lower compared with the average income levels of Bangkok and Beijing.

3.2. Knowledge of and Attitude Towards Marine Turtle Conservation

Responses to the attitudinal questions demonstrated that 76% in Beijing, 85% in Davao, 87% in Bangkok and 79% in HCM/Hanoi believed that environmental problems in their own country were not properly taken care of. Consistent with a-priori expectation from developing countries, environmental conservation was a low priority concern. As expected, economic, poverty and issues on governance were identified by respondents as the three most important problems of these countries.

The results showed that the majority of respondents (60% on average), except in HCMC/Hanoi (34%), strongly agreed that it is everyone's duty to ensure the existence of plants and animals for the future generation, showing that respondents had a bequest motive for marine turtle conservation. However, very few would agree with the idea of increasing taxes to protect these plants and animals. In Davao City, for instance, 65% of respondents strongly agreed that they were responsible to protect the plants and animals for future generations but only 4% agreed with raising taxes to protect them.

Our results showed that the sample was well-informed about marine turtles. 67% of the Davao sample and 57% of the Bangkok sample had seen live marine turtles. From the total number of respondents, 98% in Bangkok, 81% in Beijing, 79% in Davao and 78% in HCM/Hanoi had watched documentaries, National Geography and Discovery program about marine turtles. The majority (82%) knew that marine turtles lay eggs on land. The sample also contained some users of marine turtles. 10% of the Bangkok sample, 6% of the Beijing,

Table 3
Socio-demographic profile of respondents.

Variables	Mean	Standard deviation	Minimum	Maximum
Age				
Beijing, China	43	15	18	91
Davao City, Philippines	42	13	18	92
Bangkok, Thailand	38	10	18	83
Ho Chi Minh/Hanoi, Vietnam	38	14	16	90
Education (number of years)				
Beijing, China	13	3	0	24
Davao City, Philippines	11	3	1	18
Bangkok, Thailand	14	3	0	18
Ho Chi Minh/Hanoi, Vietnam	12	4	0	25
Household Size (member numbers)				
Beijing, China	3	1	1	11
Davao City, Philippines	6	2	1	23
Bangkok, Thailand	4	2	1	15
Ho Chi Minh/Hanoi, Vietnam	5	2	1	21
Income (US$/HH/month)				
Beijing, China	562	450	31	3750
Davao City, Philippines	165	147	50	1000
Bangkok, Thailand	592	528	63	2500
Ho Chi Minh/Hanoi, Vietnam	213	166	31	937

5% of the HCM/Hanoi and 4% of the Davao sample had ever purchased or owned a product made from the shell of a marine turtle.

3.3. Respondents' Willingness to Pay for Marine Turtle Conservation

In order to analyze respondents' WTP for marine turtle conservation, we first pooled the data from all the three scenarios (regional mandatory program, regional voluntary program and national mandatory program) for each country and for all countries. Table 4 shows the independent variables included in the multivariate logit regression models. The results are reported in Table 5.

As expected, the estimation parameters with regard to 'Bid' (Price bids) were positive in all five estimations and were significant at the 0.01 significance level. This means that, with a higher bid amount, respondents would be less likely to support the marine turtle conservation program, in line with the economic theory of demand.

Conforming to a-priori theoretical expectations, in the country-level or the pooled model, the coefficient on the 'Income' (household monthly income) variable was positive and significant at the 0.01 significance level, implying that income is an important factor affecting the WTP for marine turtle conservation. The respondents who had more household income would like to pay more for the marine turtle conservation program.

In the pooled model and HCM/Hanoi model, the variable 'Education' (years of schooling) was positive and significant at the

Table 2
Usable samples by different scenarios.

Design	Conservation program scenarios			Pooled samples
Scope	Regional		National	
Payment vehicle	Mandatory	Voluntary	Mandatory	
Beijing, China	200	200	200	600
Davao City, Philippines	281	285	281	847
Bangkok, Thailand	280	261	248	789
Ho Chi Minh and Hanoi, Vietnam	488	474	482	1444
Total	1249	1220	1211	3680

Table 4
Definitions of variables included in the logit model.

Variable	Definition
Bid	Bid used in WTP questions (US$)
HHsize	Number of household members living together
Age	Age of respondents
Gender	1 = male, 0 = female
Education	Education of respondents (years of schooling)
Income	Total household income (1000 US$/month)
Marriage	1 = married, 0 = others
Member	"1" for environmental organization member, and "0" otherwise
Cn	1 = Beijing, 0 = others
Ph	1 = Davao, 0 = others
Th	1 = Bangkok, 0 = others

Table 5
Multivariate logit regression results (full sample).

Variables	Beijing	Davao	Bangkok	HCM/Hanoi	Pooled
Constant	−0.80(0.69)	0.38(0.50)	−0.02(0.36)	−0.21(0.29)	−0.26(0.22)
Bid	−0.44***(0.04)	−0.42***(0.05)	−0.50***(0.05)	−0.51***(0.05)	−0.46***(0.02)
HHsize	0.05(0.08)	−0.009(0.03)	0.05(0.05)	−0.06**(0.03)	0.001(0.02)
Age	−0.003(0.009)	−0.01(0.01)	−0.005(0.004)	0.01(0.01)	−0.01*(0.003)
Gender	−0.10(0.20)	0.12(0.16)	0.02(0.16)	0.05(0.12)	0.08(0.07)
Education	0.04(0.03)	−0.02(0.03)	0.04(0.03)	0.03***(0.01)	0.02***(0.01)
Income	1.37***(0.26)	1.99***(0.56)	0.38***(0.14)	1.04***(0.37)	0.66***(0.12)
Marriage	0.42(0.32)	0.06(0.20)	0.05(0.17)	−0.40***(0.15)	−0.02(0.08)
Member	0.55(0.69)	0.77***(0.23)	0.68***(0.20)	0.24(0.34)	0.58***(0.16)
Cn					0.22(0.13)
Ph					0.12(0.09)
Th					0.07(0.11)
Summary statistics					
Observations	598	839	789	1430	3656
Log-likelihood	−309	−505	−475	−857	−2173
Pseudo R^2	0.23	0.12	0.12	0.11	0.12

Note: ***, **, and * are significant at 0.01, 0.05 and 0.1, respectively; figures in parentheses are standard errors.

0.01 significance level, indicating that the probability of saying 'yes' to the WTP question increased with the number of years of schooling. This is understandable because, more years of schooling would arguably increase a person's knowledge about social, political, economic and environmental happenings. Moreover, the education would help a person comprehend the conservation program.

The 'Member' variables (membership to environmental organization) in the pooled model, Davao model and Bangkok model were positive and highly significant, suggesting that the respondents with general environmental awareness would be willing to pay more for marine turtle conservation.

The country dummy variables were not significant in the pooled model. This finding suggests that cultural differences *per se* seem to be not an important determinant of demand for marine turtle conservation. Income and other demographic and socio-economic factors could be more important.

Based on the regression results, we can estimate the mean WTP. For the DC elicitation format, the mean WTP was estimated based on Hanemann's random utility maximize model (Hanemann, 1984). The binary logit approach gives the basic relationship:

$$\text{Prob(Yes)} = 1 - \{1 + \exp[B_0 - B_1(\$X)]\}^{-1}$$

where Bs are coefficients and $\$X$ is the bid amount that the household is asked to pay. From the above equation, Hanemann (1989) provides a formula to calculate the mean WTP as:

$$\text{MeanWTP} = -(B_0/B_1)$$

where B_1 is the coefficient estimate on the bid amount; B_0 is either the estimated constant (if no other independent variables are included) or the grand constant calculated as the sum of the estimated constant plus the product of the coefficient estimates on other independent variables and times their respective means.

The mean WTP values are presented in Table 6. It can be seen that for the lower income cities such as Davao City in the Philippines and Ho Chi Minh/Hanoi in Vietnam, the mean WTP was around 0.30 US$/month per household. For the relatively higher income cities, the mean WTP values of Beijing and Bangkok household were 1.28 US$/month per household and 1.08 US$/month per household, respectively. These values were comparable to the WTP values for other species from studies in Asia (Harder, 2006).

The percentage of mean WTP to total monthly household income for the five cities is also presented in Table 6. The results showed that the ratio was between 0.14% and 0.24%, which implies realistic payment capability for these Asian households. The value of contribution was comparable to what people in developed countries would be willing to pay, which was 0.24% and 0.08% of their annual per capita income for the spotted owl (Loomis and Ekstrand, 1998) and the gray-blue whale (Bulte and Kooten, 1999), respectively.

Since each city may have very different purchasing power, in order to further compare WTP values across cities, we tried to control for income, meaning if income will not be a constraint or a deciding factor, how much would respondents be willing to pay? Would the trend be the same across countries? This was done by using the same income level for all countries (average of all samples, which is 340 US $/HH/month) to estimate the mean WTP. The results in Table 7 show that indeed WTP value is associated with factors other than income. In particular, the respondents in Davao City given their more perceptions and knowledge about marine turtles would want to pay higher for marine turtle conservation.

3.4. Respondents' Attitude Towards Payment

Frequently selected reasons for saying 'yes' to the WTP questions are shown in Table 8. The most important reason for stating a positive WTP was respondents' belief that marine turtle is an important animal and should be protected. A number of respondents in Beijing and HCM/Hanoi believed that marine turtles could be protected through the collaboration of several countries, while few respondents in Davao city believed collaboration of several countries would help marine turtle conservation. A larger proportion of Davao sample believed East Asia is the center of illegal trade in the world and it is high time for the people in this area to protect marine turtles, while few Beijing sample believed this. More Beijing and Bangkok sample believed marine turtle conservation efforts could lead to other endangered species conservation in the region.

Frequently selected reasons for 'No' WTP answers are presented in Table 9. Except for Bangkok, the top reason of those who said 'No' to

Table 6
Estimate of mean WTP as proportion to income.

	Mean WTP (US$/household/month)	% WTP to total Household income
Beijing, China	1.28	0.24
Davao City, Philippines	0.32	0.19
Bangkok, Thailand	1.06	0.17
HCM/Hanoi, Vietnam	0.30	0.14

Table 7
Mean WTP estimates at the same income level.

Cities	Mean WTP (US$/household/month)
Beijing	1.44
Davao City	1.23
Bangkok	1.10
Ho Chi Minh/Hanoi	0.96

Table 9
Frequently selected reasons for 'No' WTP answer (%).

Reasons	Beijing	Davao City	Bangkok	HCM/Hanoi
I cannot afford that amount.	39	36	13	27
I do not trust the institutions that will handle the money for this conservation work.	20	5	14	19
I do not believe paying will solve the problem.	18	5	4	11
It should be the government's responsibility since it already has money from my tax revenues.	7	27	41	10

the WTP question was that they could not afford the amount. In the case of Bangkok, majority of those who answered 'No' declared that they believed it was the government's responsibility. One of the reasons that could help explain the behavior or attitude of respondents in Bangkok is because of the political turmoil that was happening during the time that the survey was conducted. For Beijing and HCM/Hanoi samples, the other two main reasons were that the respondents did not trust the institutions that will handle the money for the conservation and they did not believe paying would solve the problem. For other two democratic countries, the percentage of these two reasons was relatively lower.

3.5. Hypothesis Testing Results

The study applied hypothesis testing using logistic regression to assess both scope effect and payment vehicle effect. To start off, socio-economic characteristics of the respondents were compared using t-test. The results showed that there was no statistical difference for all study areas on the characteristics of respondents for both the scope and payment design group comparison.

3.5.1. Scope Effect Test

The hypothesis investigated is whether the WTP for a national conservation program was statistically different from the WTP for the regional conservation program. A dummy variable "Region" was included to the logit regression model (Regional = 1; National = 0). The sample used in this model was pooled from the sample for the regional mandatory program and the sample for the national mandatory program for each country. The regression results for the test are shown in Table 10.

The results showed that the coefficients on 'Region' are not significant in Beijing, Davao and Bangkok. Only in HCM/Hanoi, the 'Region' coefficient is positive and significant at the 0.01 significance level, suggesting the respondents would pay more if the conservation program is regional. The results imply that it was only in HCM/Hanoi where there was a statistical difference in WTP values for different scopes, while there was no scope effect in the other three cities. Several possible reasons can be addressed for this finding. Firstly, people were genuinely indifferent to the scale of the program as long as marine turtles will be protected, which is consistent with the

hypothesis raised by Baron and Greene (1996). It states that responses are governed largely by perceived importance of issues, which is independent of quantity. Secondly, although most respondents knew of marine turtles, many may not have known much about their life-cycles and migration. They were indifferent to the conservation effort nationally or internationally. Finally, it may have been that respondents wanted to purchase some moral satisfaction by making a token contribution to conservation, no matter if it is a national or international program.

3.5.2. Payment Vehicle Effect Test

The study also employed logistic regression to test whether the WTP based on the mandatory payment vehicle was statistically different from the WTP based on the voluntary payment scheme. A dummy variable 'Mandatory' was included in the multivariate logit regression model (Mandatory = 1; Voluntary = 0). The sample used in this model was pooled from the sample for the regional mandatory program and the sample for the regional voluntary program for each country. The estimation results are presented in Table 11.

The regression results showed that some important variables such as 'Bid' and 'Income' were highly significant and had expected signs. However, the dummy variable 'Mandatory' was only positive and significant in the Vietnam dataset. This result indicates that only for the Vietnamese, the mandatory payment vehicle would produce higher willingness to pay for the marine turtle conservation. The respondents in Beijing, Davao and Bangkok were indifferent for the payment vehicle.

4. Conclusion

Marine turtles play an important role in the ecology and well-being of coastal and open ocean environments for various reasons. However, as a result of the adverse consequences of human activities, marine turtles have become endangered (Tisdell and Wilson, 2002). Positive human action is required to ensure the survival of most species of marine turtles. This study was conducted to estimate the WTP of respondents in five Asian cities for marine turtle conservation. A secondary objective is to investigate two methodological issues: scope effect and payment vehicle effect.

Household heads from Beijing, Davao City, Bangkok and HCM/Hanoi were surveyed using a single CVM survey instrument and common survey procedure. Most respondents were very articulate in providing both positive and negative answers to the WTP questions, as well as in giving their opinions about issues related to marine turtle conservation.

The survey results show that people in the five cities had already been exposed to abundant information, generally aware and well-informed about marine turtle. They believed that conservation was important but at the moment, their priorities understandably lay in other public policy issues such as reducing poverty and improving governance.

Table 8
Frequently selected reasons for 'Yes' WTP answer (%).

Reasons	Beijing	Davao City	Bangkok	HCM/Hanoi
The marine turtle is an important animal and should be protected.	48	41	39	34
I believe that marine turtles can only be protected through the collaboration of several countries.	19	6	10	29
It is high time that the people in East Asia do something concrete about protecting the marine turtles — since this is the center of illegal trade in the world.	4	16	9	9
This initiative can lead to more protection efforts for other endangered species in the region.	22	15	21	9

Table 10

Multivariate logit regression results for the scope test (subsample).

Variables	Beijing	Davao City	Bangkok	HCM/Hanoi
Constant	−0.78(0.81)	−0.36(0.61)	−0.82(0.72)	−0.35(0.38)
Bid	−0.44***(0.06)	−0.42***(0.06)	−0.52***(0.06)	−0.51***(0.05)
HHsize	−0.02(0.09)	0.03(0.04)	0.05(0.06)	−0.06(0.04)
Age	0.00(0.01)	−0.01(0.01)	0.01(0.01)	0.01(0.01)
Gender	−0.24(0.25)	0.22(0.19)	0.43(0.21)	−0.05(0.14)
Education	0.04(0.04)	0.01(0.03)	0.05(0.03)	0.04*(0.02)
Income	1.79***(0.36)	1.88***(0.67)	0.20*(0.20)	1.83**(0.21)
Marriage	0.47(0.38)	0.20(0.25)	−0.06(0.21)	−0.40**(0.19)
Member	0.85**(0.42)	0.81***(0.29)	0.10(0.51)	−0.07(0.40)
Region	−0.12(0.25)	0.13(0.19)	0.05(0.19)	0.40***(0.14)
Summary statistics				
Observations	400	557	528	960
Log-likelihood	−203	−332	−314	−576
Pseudo R^2	0.24	0.10	0.13	0.12

Note: ***, **, and * are significant at 0.01, 0.05 and 0.1, respectively; figures in parentheses are standard errors.

Our results show that there is a positive WTP for marine turtle conservation in all cities. This is an encouraging result. It indicates that the public in the five Asian cities positively value the benefits of marine turtle conservation, and are willing to pay to support their conservation programs. The values obtained in this study can be quantified indications of the value placed by the five cities on marine turtle conservation.

Although the mean WTP perceived are indeed low, the percentage of mean WTP to total monthly household income obtained implies realistic payment capability for these Asian households. As such, they are useful for cost benefit analysis and for debate and decision-making on conservation strategies. The study may contribute to drawing the attention of policy makers in formulation of appropriate policy mechanisms and helping to set conservation activities.

The results also suggest that cultural differences *per se* could be not an important determinant of demand for marine turtle conservation. One possible reason for this is that marine turtle is a migratory species. These countries surveyed form part of the migratory route of marine turtles where many major nesting sites and feeding grounds of marine turtles can be found (Perrine, 2003). Loomis (2000) stated that political boundaries are not the same as the market boundaries for WTP for species. Collaborative cooperation between different countries that form the migratory route of marine turtles is imperative in order to effectively implement the conservation activities.

In terms of people's attitude towards payment, the most cited reason for paying was that the respondent thought marine turtle is an important species. The majority of Bangkok respondents who stated 'No' to the WTP questions thought the marine turtle conservation was the government's responsibility. A large number of respondents in Beijing and HCM/Hanoi who would not pay stated that they did not trust the institutions and they did not believe paying would solve the problem. Thus, efforts to develop conservation finance mechanisms should therefore be directed to improving the trustworthiness of government and expenditure systems. Conservation agencies might play a role in this by working with governments to set up trust funds in which public funds could be deposited with confidence. Eventually, as income rise and governance improves, Asia's ability to pay for conservation will increase.

The type of scope effect and payment vehicle effect considered did not seem to be significant in Beijing, Davao City and Bangkok, with the exception of HCM/Hanoi sample. Although respondents did have a positive value for the marine turtle conservation, they were indifferent, no matter how the fund would be collected and how big the conservation program was. No guidelines exist in the international literature about how much payment vehicle or scope invalidates a CVM study. Scope test failures can occur for reasons that are quite consistent with psychological and even economic theory (Heberlein et al, 2005). As Wiser (2007) suggested, selection of an incentive-compatible mandatory payment approach or a non-incentive-compatible voluntary approach may not be a decisive factor in CV surveys.

Acknowledgments

Table 11

Multivariate logit regression results for the payment vehicle test (subsample).

Variables	Beijing	Davao City	Bangkok	HCM/Hanoi
Constant	−0.32(0.95)	−0.12(0.62)	−0.20(0.71)	−0.48(0.36)
Bid	−0.50***(0.06)	−0.39***(0.06)	−0.50***(0.06)	−0.48***(0.05)
HHsize	−0.09(0.12)	0.03(0.04)	0.03(0.06)	−0.05(0.04)
Age	0.00(0.01)	−0.01(0.01)	0.003(0.01)	0.01(0.01)
Gender	−0.24(0.25)	0.22(0.19)	0.28(0.19)	0.19(0.14)
Education	0.03(0.04)	0.01(0.04)	0.04(0.03)	0.04**(0.02)
Income	1.54***(0.34)	1.56***(0.73)	0.05*(0.19)	1.78**(0.56)
Marriage	0.56(0.40)	0.09(0.24)	0.23(0.21)	−0.49***(0.18)
Member	0.29(0.52)	0.74***(0.28)	0.70(0.53)	0.26(0.43)
Mandatory	−0.14(0.25)	−0.19(0.18)	−0.13(0.19)	0.40***(0.14)
Summary statistics				
Observations	400	560	541	953
Log-likelihood	−198	−345	−325	−572
Pseudo R^2	0.26	0.09	0.13	0.12

Note: ***, **, and * are significant at 0.01, 0.05 and 0.1, respectively; figures in parentheses are standard errors.

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