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MEASURING THE WTP FOR RECREATION AND BIODIVERSITY PROTECTION PROGRAMS

by

Paulo Augusto NUNES

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Katholieke Universiteit Leuven
Departement Economie
Naamsestraat 69
B-3000 Leuven

Measuring the WTP for
Recreation and Biodiversity Protection Programs
a univariate parametric statistical specification

Paulo Augusto NUNES*

Center for Economic Studies, Department of Economics
Catholic University Leuven

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Abstract:

This paper focus on a contingent valuation (CV) exercise as to compute estimates for the willingness to pay (WTP) for recreation and biodiversity benefits of a Natural Park in Portugal. The CV survey gathers 1678 respondents and three development policy options. We refer to the Wilderness Areas (WA) tourism development scenario; the Recreational Areas (RA) tourism development scenario and, finally, a scenario version which is characterised by the tourism development of both WA and RA.

The results show that the respondents evaluate the WA and RA differently. However, we find no statistical difference between the WTP for the WA and the WTP for the WA jointly with the RA. The last result can be interpreted as an indicator of an eventual presence of warm-glow in the WTP responses.

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* Ph.D. student at the Department of Economics, Catholic University of Leuven. Correspondence: Center for Economic Studies, Naamsestraat 69, 3000 Leuven, Belgium; e-mail: PauloDias.Nunes@econ.kuleuven.ac.be

INTRODUCTION

In this paper we perform a valuation exercise as to compute estimates for the willingness to pay (WTP) for the recreation and biodiversity benefits provided by the Alentejo Natural Park. Combining the use of maps, photos and computer generated scenarios we design a set of three survey versions, corresponding to three policy protection programs. In these surveys, respondents are asked about their WTP to prevent tourism development as described by the survey instrument

The paper is divided into three major sections. In the first section we outline the current situation concerning the management of the Natural Park, present the protection programs and describe the structure of the questionnaire. In the second section we run estimation exercises as to compute estimates of the WTP for the different protection programs. Furthermore, we explore the impact of the zero-protest responses and the elicitation question format on the final WTP estimates. Moreover, and as to capture the magnitude of the very high stated WTP on the final estimates, we run the estimation exercise bearing in mind different priors concerning the underlying distribution function. In the last section we use the computed WTP estimates and perform formal testing as to examine the *ex ante* presumptions on the nature of the respondents preferences. We check for degree of sensitivity of the estimates across the described protection programs and investigate whether a warm-glow is present in the stated WTP responses (Kahneman and Knetsch, 1992).

1. STATEMENT OF NATURAL RESOURCE PROBLEM

The Alentejo cost line constitutes one of the least urbanised littoral areas of Portugal. Like in many other countries, we have been observing an intensification of the conflicts and disputes over the alternative use possibilities of such natural site. On one hand we find the Portuguese Governmental Agency for Nature Protection (*Instituto Conservação da Natureza - ICN*) who claims for the preservation of the natural area. Recently, more specifically in 1995, ICN established the *Parque Natural do Sudoeste Alentejano e Costa Vicentina*[1]: a protected area where roads, commercial and tourism development, mechanical equipment and other improvements are prohibited (*Ministério do Ambiente e Recursos Naturais*, 1995a). On the other hand we can find the tourism industry, together with the local municipalities, who claim for the development of the tourism potential of the Natural Park and the creation of employment in the area. The question we propose to address is to determine the value that the Portuguese households place on the different tourism development options which have been recently proposed by the tourism industry next to the governmental authorities. Since the major values in dispute are typically referred to as non-use or existence values[2] (Krutilla 1967), we selected the Contingent Valuation Method (Mitchell and Carson, 1989) as the measurement approach since it is the valuation technique capable of including the non-use value component when measuring the total value of the natural resource.

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[1] Shortly, the Alentejo Natural Park

[2] The measurement of the non-use or existence values plays an important role in the proposed valuation exercise because Portuguese may willing to pay to continue to see the Alentejo Natural Park free from any tourism development even though the they do not intend to visit it.

1.1. THE SURVEY VERSIONS

Given the present zoning (*Ministério do Ambiente e Recursos Naturais*, 1995b) we are able to characterise the Alentejo Natural Park in terms of two major zones: the Wilderness Areas (WA) and the Recreational Areas (RA). The first refers to the geographical area of Park that is allocated to the protection of the local biodiversity: the visitors' access is here restricted and roads, commercial development, mechanical equipment and other improvements are prohibited - the Park's nonuse value component. The second category refers to the geographical area of the Park that is allocated to the human use: it is open to all visitors and they are here able to enjoy a set of recreational activities in a natural environment - the Park's use value component. Given that, we design three major survey versions corresponding to three protection policy options - see Box 1.

Box 1: Survey Versions

Version 1: Preventing Tourism Development in WA
Version 2: Preventing Tourism Development in RA
Version 3: Preventing Tourism Development in both WA and RA

On one hand we have the WA tourism development scenario; on the other hand we have the RA tourism development scenario. Finally we consider a scenario version which is characterized by the tourism development of both WA and RA.

1.2. THE SURVEY INSTRUMENT

Before putting the final survey instrument into the field, we engaged in an extensive up-grading fine-tuning process over a ten-month period. We used state-of-the-art techniques in developing questionnaires and followed closely the guidelines recommended by the NOAA panel (Arrow et al., 1993), including the use of focus groups, field pre-testing and one-to-one interviews. The national survey was implemented in September and executed by the survey department of the Portuguese Catholic University. The interviewer teams rang the bell of 3597 households but 21% of them were not reachable since they were not at home. From the households that were successfully contacted, we received a total of 1678 completed interviews. For a personal interview, the present study reveals a rather high non participation response, around 40%[3]. To better mimic price taking in market behavior, the respondents are asked whether they are willing to pay a given monetary amount as to continue the protection of the Park. The monetary amount is stated in the instrument survey and varies randomly from respondent to respondent. We used the same bid design across the three survey versions. This question format is referred to as take-it-or-leave-it (TIOLI), i.e., a dichotomous-choice or referendum format question (Cameron and James, 1987; Cameron, 1988). To improve the statistical efficiency, we include a follow-up valuation question: the double dichotomous choice response model. The sequence of responses will be used to infer the respondent's maximum WTP (Hanemann et al., 1991; Cameron and Quiggin, 1994) - see Table 1.

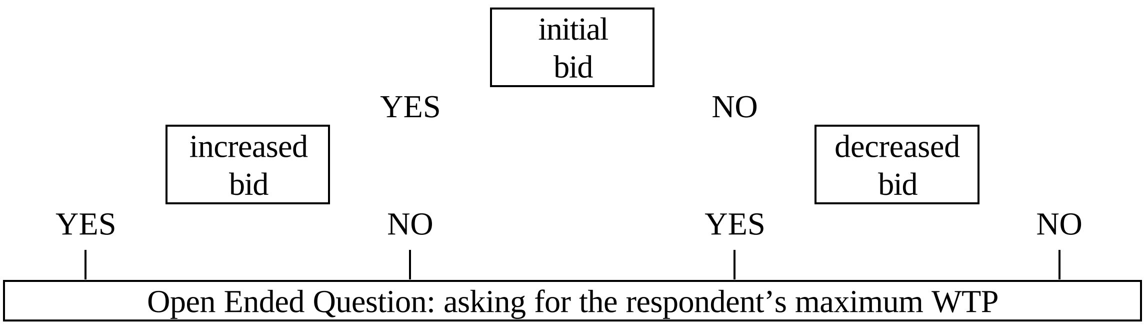
[3] The CV in-person interviews are characterized by higher response rates than, for example, mail surveys. The latter typically range between 20% and 60% (Whitehead et al., 1993). Nevertheless, survey researchers have been facing an increasing non-cooperative trend over time, especially in developing countries (Deaton, 1997).

Table 1: Bid designs used in the CV experiment (in PTE[4])

initial bid *(b_i)*	higher bid *(b_h)*	lower bid *(b_l)*
1200	3600	600
2400	4800	1200
4800	9600	2400
9600	24000	4800

After having answered both referendum questions, each respondent is asked to state, through an open ended question (OE), her maximum willingness to pay. Box 2 describes the complete elicitation procedure.

Box 2: Elicitation Question format: double DC with an OE follow-up



For example, the respondent may get a bid card such that she will be asked if her household *“would agree to pay 2400 escudos”* for the described protection program; if she answers positively then she faces a follow-up question with a higher amount *“would your household still agree to pay 4800 escudos”*. If she refuses the initial bid then in the second round she will be asked for a smaller amount *“would your household still agree to pay 1200 escudos”*. Independently of the respondent’s dichotomous choice answering pattern, she is always asked to state *“what is the maximum that your household is willing to pay”*.

[4] 180 PTE ≅1USD.

2. ANALYSIS OF THE STATED WTP RESPONSES

In this section we perform an econometric analysis of the stated WTP responses as to compute welfare estimates from the described protection programs. The proposed estimation approach is anchored in the dichotomous choice elicitation format. We assume that the respondent's stated WTP responses is based on an unobserved *true* continuous variable. Therefore we use the respondent's "yes-no" decisions upon the bid amounts offered to her as a proxy variable for the unobserved *true* WTP. The underlying idea is that the respondent evaluates her utility in two stages, with and without protection plan, and if she thinks that her willingness to pay for the described scenario exceeds the stated bid, then she would accept to pay or else she refuses it. Consequently we use a limited dependent variable choice model (Maddala, 1983) and explore the variation of the bid values across the sample as to assess the underlying valuation function, i.e., the *true* WTP of the respondent. Since we adopt the double bounded, for each j respondent we face four possible response outcomes: "no/no", "no/yes", "yes/no" and "yes/yes" respectively coded as $r_{nn}{}^{j}$, $r_{ny}{}^{j}$, $r_{yn}{}^{j}$ and $r_{yy}{}^{j}$ binary indicators variables. The contribution to the (log)likelihood function from one observation is then,

$$r_{nn}{}^{j}\ln F\left(b_l^j;q\right)+r_{ny}{}^{j}\ln\left[F\left(b_i^j;q\right)-F\left(b_l^j;q\right)\right]+r_{yn}{}^{j}\ln\left[F\left(b_h^j;q\right)-F\left(b_i^j;q\right)\right]+r_{yy}{}^{j}\ln\left[1-F\left(b_h^j;q\right)\right]$$

where $F(.)$ is some statistical distribution function with parameter vector q. Here it is interpreted as the cumulative distribution function of the respondent's. The sum of these contributions to the likelihood function over the sample is then maximized, $\underset{\{q\}}{Max}\ L(q)$ with $L(q)$ defined as,

$$\sum_{j=1}^{N}\left\{r_{nn}{}^{j}\ln F\left(b_{l}^{j};q\right)+r_{ny}{}^{j}\ln\left[F\left(b_{i}^{j};q\right)-F\left(b_{l}^{j};q\right)\right]+r_{yn}{}^{j}\ln\left[F\left(b_{h}^{j};q\right)-F\left(b_{i}^{j};q\right)\right]+r_{yy}{}^{j}\ln\left[1-F\left(b_{h}^{j};q\right)\right]\right\}$$

the ML estimator for the double-bounded model, $\hat{q}$, is the solution to the equation $\P L\left(\hat{q}\right)/\P q=0$. To come up with such estimates is necessary to assume that the stated WTP responses are distributed according to a particular distribution family. However the “true” underlying distribution of the WTP is unknown. So the choice of the distribution function is an important step for the analysis of the stated WTP responses.

The distributional prior

We approach the choice parametric specification in the following way. For each survey version, we fit to the double bounded data several family distributions. We use the Weibull distribution, the log-normal distribution, the exponential distribution and the log-logistic. Table 2 contains the Log Likelihood statistic for each of the distributions across the different survey versions. The task is now to choose one of the specifications.

Table 2: Log likelihood statistics for all survey versions

Survey Version	Log-Normal	Weibull	Exponential	Log-Logistic
WA	-515,25	-504,14	-522,81	-517,09
RA	-360.39	-357.79	-373.17	-361.14
(WA+RA)	-807,78	-796,72	-841,17	-810,67

For the Weibull and the exponential, the choice is straightforward because these are nested distributions. Using the restricted and unrestricted log-likelihood, we are able to reject the exponential distribution in favour of the Weibull[5]. This test can not be

[5] The Weibull distribution (unrestricted model) collapses to the exponential distribution (restricted model) when the scale parameter is 1. The likelihood test statistic equals 37.34, 34.32 and 88.9 respectively for the WA, RA and (RA+WA) protection programs. When the restricted model is

extended to the log-normal and log-logistic because these distributions are not nested with the Weibull. The choice can be then be based on the Akaike Information Criteria (AIC) for each parametric specification (Sakamoto et. all. 1943). Table 3 reports the AIC values by survey version and distribution family.

Table 3: Akaike Information Criteria (AIC)

Survey Version	Log-Normal	Weibull	Log-Logistic
WA	1035	1012	1038
RA	724	720	727
(WA+RA)	1620	1597	1625

According to the AIC, the Weibull and the Log-Normal distribution functions provide the best fit to our data. Therefore we explore the two parametric models, one using the Weibull and the other the Log-Normal, in the valuation exercises.

The zero-response protests

We extend the estimation of the WTP to a sub-sample in which we exclude the zero-response protests. As to identify such response pattern we used direct information given by the "no-no" respondents. In fact, we include a section in the instrument survey containing a list of arguments which could possibly justify such answering behavior. The complete list presented in the instrument survey is given in box 3. Without having the ambition of being exhaustive, the list tries to capture the possible reasons for "no-no" refusals. From this list, the respondent is asked to choose the most important motive which she thinks is responsible for being unwilling to pay any positive amount of money.

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corrected, this statistic follows a c^2 with one ($= df_U - df_R$) degree of freedom. The tests clearly exceed 3.84, critical value at 95 percent reference level, dictating the rejection of the exponential distribution.

Box 3: List of reasons for not being willing to pay for the protection program

i) I can not afford to contribute with so much money
ii) I do not believe in the described payment scheme
iii) I prefer to spend that amount of money in other things
iv) The proposed protection plan does not worth so much money
v) I do not agree with this type of questions
vi) The proposed protection plan is a break to the development of the region
vii) I believe that this questionnaire is not the best way to approach the topic
viii) The protection of nature does not have a price and therefore I do not accept any tourism development of the natural area
ix) I do not accept any increase in the taxes (for the "TAX" format)
ix) I do not accept any voluntary contribution since the protection of natural areas is a responsibility of the Portuguese government (for the "VC" format)

For example, the respondent may argue that she has has not sufficient money to contribute, reason i), or simply be unwilling to contribute because she thinks that the protection plan constitutes a break to the development of the region, reason vi), . As to identify zero protest bids, reasons ii), v), vii) and ix) are considered as the underlying protest arguments. Unlike the others, these arguments are not associated with budget constraint situations neither with weak preference motivation towards the described protection programs. They reflect a set of respondent's objections concerning the lack of seriousness of the proposed payment mechanism - reason ii) - or the respondent's reluctance to the questionnaire as an approach to deal with the topic - reasons v) and vii). Furthermore, the zero response protest may underline the respondent's explicitly disapproval towards the payment mechanism - reason ix).

Once cleaned the original sample from the zero protest responses and decided upon the distributional priors to use, we are in conditions to compute estimates for the mean WTP. The final estimation results are presented in the next section.

3. A UNIVARIATE ESTIMATION OF THE WTP

3.1. The log-normal distribution model

For a parametric model with a log-normal distribution, the mean WTP is given by $WTP = e^{\hat{b}+\frac{1}{2}\hat{s}^2}$ where b and s denote the location and scale parameters of the distribution. The goal is to compute the Maximum Likelihood estimates of the location, $\hat{b}$, and scale, $\hat{s}$, and use them to estimate the mean of the population distribution. Maximizing the likelihood function for the double-bounded WTP data yields the parametric estimates for the stated WTP responses[6]. We apply this model to the three protection programs across the two sample dimensions - see Table 4.

Table 4: **Log-Normal distribution (in PTE)**

survey	median	90% confidence interval	mean	90% confidence interval	log likelihood
all sample					
WA	1845	[1566-2173]	9753	[6053-16223]	-578,52
RA	1130	[928-1376]	4960	[3748-6580]	-408,71
WA+RA	1495	[1311-1705]	9091	[6089-13871]	-907,53
zero-protest-responses eliminated					
WA	2746	[2360-3196]	9851	[6606-15087]	-515,25
RA	1744	[1467-2074]	5348	[3470-8530]	-360,39
WA+RA	2326	[2047-2642]	9259	[6535-1374]	-807,78

In order to improve the quality of the estimations results we focus the analysis of the WTP estimates provided by the sample in which we exclude the zero-response protests. Here we get point median estimates of 2.746$00, 1.744$00 and 2.326$00, respectively, for the WA, RA and (WA+RA) protection programs.

[6] Calculations are performed using the PROC LIFEREG procedure in *SAS*®.

As far as the mean is concerned, we have WTP estimates of 9.851$00, 5.348$00 and 9.259$00. Since the heavy right tail of the log-normal distribution is the primary determinant of the estimate of the mean, the mean estimates are much higher than the median estimates. When performing the estimation exercise for all respondents, and therefore including the zero-protest responses, we get, as we could initially expect, lower estimates.

3.2. The Weibull distribution model

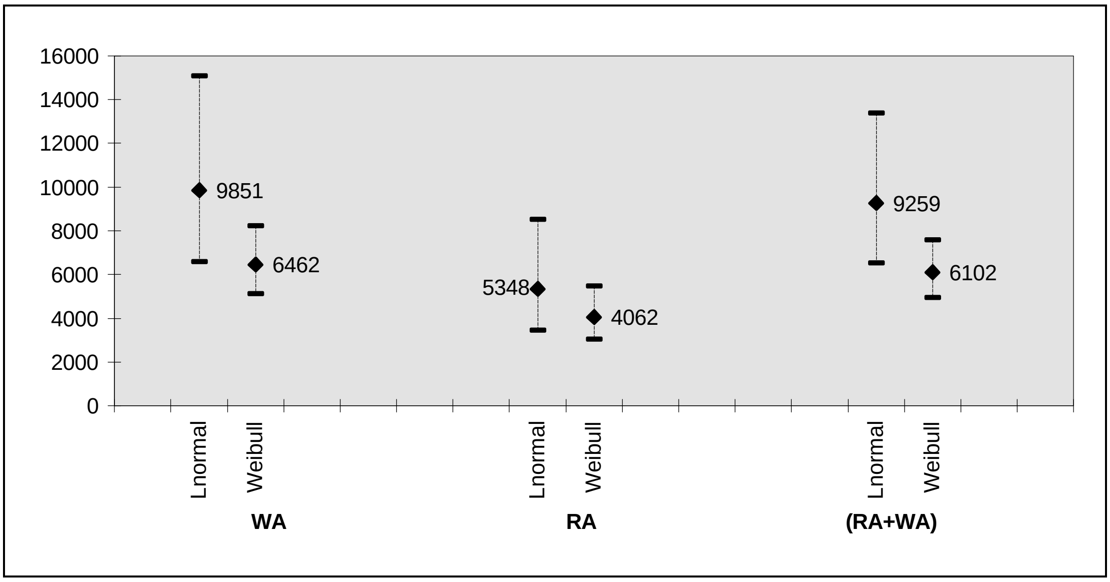
For a parametric model with a Weibull distribution, the mean WTP is given by $WTP = e^{\hat{b}}\Gamma(1+\hat{s})$. Once again the goal is to use the parameters estimates, $\hat{b}$ and $\hat{s}$, to compute the mean of the population distribution. Maximizing the likelihood function for the double-bounded WTP data yields the parametric estimates as reported in Table 5.

Table 5: **Weibull distribution**

survey	median	90% confidence interval	mean	90% confidence interval	log likelihood
all sample					
WA	2005	[1833-2500]	5870	[4382-5975]	-566.99
RA	1077	[968-1077]	3487	[2409-5156]	-410.22
WA+RA	1571	[1457-1695]	5473	[4195-7216]	-895.39
zero-protest-responses eliminated					
WA	3039	[2793-3306]	6462	[5126-8236]	-504,14
RA	1826	[1660-2010]	4062	[3065-5472]	-357,79
WA+RA	2527	[2355-2715]	6102	[4948-7588]	-796.72

The median estimates for the Weibull and log-normal distribution are all quite close. We got values around 3.000$00, 1.800$00 and 2.500$00 respectively for the WA, RA and WA+RA protection programs. Moreover, all these parametric estimates are consistent with respect to the intervals obtained with the non-parametric estimators (Nunes, P., 1998). The mean estimates are larger than the median and vary more. The mean for the Weibull distribution is about 30 percent less than that obtained under the log-normal distributional assumption. Bearing in mind their 90% confidence interval estimates, we observe an interval width overlapping. This may suggest that such differences may not be statistically significant. The results are illustrated in Figure 1.

Figure 1: Log-Normal Vs. Weibull Parametric WTP Estimates



However, and since we believe in the presence of a heavy right on the true underlying distribution[7], we choose to continue the econometric work using the parametric model specification which takes the the log-normal as the distributional prior.

[7] The right tail correspondents to respondents with a very high WTP and it is often associated with the presence of outliers (Nunes, P., 1998).

4. SENSITIVITY ANALYSIS OF THE WTP ESTIMATES

In a first stage, we check whether the RA and the WA are viewed by the respondents as the same or a different way. Formally we test the following hypothesis:

Hypothesis 1:

$$\text{H}_0\text{:} \quad WTP_{RA} = WTP_{WA}$$
$$\text{H}_1\text{:} \quad WTP_{RA} \neq WTP_{WA}$$

with

$WTP_{WA} \equiv U(WA, RA) - U(T, RA)$, where the *true* willingness to pay for the WA is given by the difference in utility between the scenario where there is full protection of Alentejo Natural Park and the scenario where the WA is submitted to truism development; and $WTP_{RA} \equiv U(WA, RA) - U(WA, T)$, where the *true* willingness to pay for the RA is given by the difference in utility between the scenario where there is full protection of Alentejo Natural Park and the scenario where the RA is submitted to turism development.

Since we admit that the RA and WA reflect two different value components of the Alentejo Natural Park, respectively the use and the nonuse value components, we may expect different WTP responses across the two protection programs. In such a context, the test of Hypothesis 1 could be interpreted as a test of divergent validity. Therefore, the non-rejection of Hypothesis 1 will support the divergent validity of stated WTP responses. The parametric model is fitted to the double referendum responses. The resulting maximum likelihood estimates for the location parameter and scale parameter are reported in Table 6. Included in the table is also the estimated standard error of the parameters, between parenthesis, and the likelihood ratio (LR) value for pooling the different programs into one single model. These statistics are chi-square distributed with 2 degrees of freedom with a critical value of 7.38 at 5%.

Table 6: Parametric WTP estimates for the RA and WA Protection Programs

Double Bounded: Log Normal distribution			
	Scenario 1	Scenario 2	Pooled
$\hat{b}$	7.918 (0.092)	7.464 (0.105)	7.712 (0.070)
$\hat{s}$	1.598 (0.096)	1.496 (0.112)	1.578 (0.075)
WTP	9851$00	5348$00	7762$00
lnL	-515.255	-360.393	-882.122
N	380	303	683
LR			12.948

Since the LR is clearly significant, the empirical evidence rejects the hypothesis of equal WTP estimates for the RA and the WA protection programs. Therefore we may conclude that the respondents view the protection programs differently, i.e., $WTP_{WA} - WTP_{RA} \neq 0$. Given the parameters estimates we are to conclude that the $WTP_{WA} - WTP_{RA} > 0$ or equivalently $U(WA,T) - U(T,RA) > 0$.

A further analysis of the WTP estimates consists in checking for an eventual presence of a warm-glow in the stated WTP responses. Most of the times warm-glow arises because the respondents are valuing something different rather than the described protection program: one may think that the financial contribution to the protection program, by itself provides a source of "moral satisfaction" (Kahneman and Knetsch, 1992). In such context, we are to expect that the change in the protection program is associated with a small impact on the respondent's WTP responses. Formally we are testing the following hypothesis:

Hypothesis 2:

H_0: $WTP_{RA} < WTP_{(WA+RA)}$
H_1: $WTP_{RA} \geq WTP_{(WA+RA)}$

Hypothesis 3:

H_0: $WTP_{WA} < WTP_{(WA+RA)}$
H_1: $WTP_{WA} \geq WTP_{(WA+RA)}$

with

$WTP_{(WA+RA)} \equiv U(WA, RA) - U(T,T)$, the *true* willingness to pay for both WA and RA is given by the difference in utility between the scenario where there is full protection of Alentejo Natural Park and the scenario where the WA and RA are submitted to truism development

The resulting maximum likelihood estimates for the location and scale parameters are reported in Table 7 and Table 8 respectively. As in the previous test, these statistics are chi-square distributed with 2 degrees of freedom with a critical value of 5.99 at 5%.

Table 7: WTP estimates: the RA Vs. (WA+RA) protection programs

Double Bounded: Log Normal distribution			
	Scenario 2	Scenario 3	Pooled
$\hat{b}$	7.464 (0.105)	7.751 (0.077)	7.651 (0.630)
$\hat{s}$	1.496 (0.112)	1.662 (0.084)	1.620 (0.068)
WTP	5348$00	9248$00	7810$00
lnL	-360.393	-807.778	-1172.244
N	303	608	911
LR			8.148

When testing Hypothesis 2, the LR is significant and therefore we can reject that the respondents value equally the two programs. Given the estimation results we are able to conclude that the respondents allocate a higher economic value to the joint protection program (WA+RA) when compared with the RA protection program, i.e., $WTP_{(WA+RA)} - WTP_{RA} > 0$ or equivalently $U(WA,T) - U(T,T) > 0$. As far as the Hypothesis 3 test is concerned, the test result is insignificant: a LR of 1.914 is well below the 7.38 cut-off suggesting that here we can not reject that the respondents value equally the WA and (WA+RA) programs, i.e., $WTP_{(WA+RA)} - WTP_{WA} \cong 0$ or equivalently $U(T, RA) - U(T,T) \cong 0$.

Table 8: WTP estimates: the WA Vs. (WA+RA) protection programs

Double Bounded: Log Normal distribution			
	Scenario 1	Scenario 3	Pooled
$\hat{b}$	7.918 (0.092)	7.751 (0.077)	7.816 (0.059)
$\hat{s}$	1.598 (0.996)	1.662 (0.084)	1.638 (0.064)
WTP	9851$00	9248$00	9485$00
lnL	-515.255	-807.778	-1323.99
N	380	608	988
LR			1.914

Setting the test results together we have: (a) $U(WA,T)-U(T,RA)>0$, the respondents value the RA and the WA of the Alentejo Natural Park differently since the respondents are willing to pay more for the WA protection program than for the RA protection program; (b) $U(WA,T)-U(T,T)>0$, once the RA of the Alentejo Natural Park is allocated for tourism development, the estimated WTP for the conservation of the WA is statistically different from zero; and (c) $U(T,RA)-U(T,T)\cong 0$, once the WA of the Alentejo Natural Park is allocated for tourism development, the estimated WTP for the conservation of the RA is not statistically different from zero. This empirical finding may indicate a consumption pattern across the RA and WA characterized by the fact that the RA is only a “good” when the WA is guaranteed to be preserved. We may also interpret this result as an indicator of an eventual presence of a warm-glow since in the presence of a such behaviour pattern we are to expect that the change in the protection program is associated with a small impact on the respondent’s WTP responses and get $WTP_{(WA+RA)}-WTP_{WA}\cong 0$.

5. CONCLUDING REMARKS

The present study makes use of a parametric estimation approach as to compute WTP estimates for the described protection programs. We conclude that (a) the WTP associated with the policy option characterized by preventing the wilderness area from tourism development exceeds the WTP associated with the policy option characterized by preventing the recreational area from tourism development; (b) the WTP for the prevention of tourism development in the recreation area is statistically different from the estimated mean WTP for the prevention of tourism development in the recreation area jointly with the wilderness area and (c) no difference between the estimated mean WTP for the prevention of tourism development in the wilderness areas and the estimated mean WTP for the prevention of tourism development in the recreation area jointly with the wilderness area. This empirical finding may be interpreted in terms of two hypotheses. On one hand, we have the hypothesis of a non-additive utility function, and, on the other hand, we have the hypothesis of warm-glow. Clearly additional research work on the structure of the consumer preferences, hand-in-hand with the expansion of the empirical analysis to a multivariate regression of the valuation function, will shed light on such results. Special attention should be focused on the identification of an warm glow motivation in the structure of the consumer preferences. This way we could disentangle the initial WTP estimate from the warmglow effect and compute a *dry* WTP measure, i.e., free from the warm-glow effect.

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