Uncertainty in individuals' preferences for non-commodity outputs provided by Rural Development Programs (RDPs): a contingent valuation approach

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Abstract: Rural development programs (RDPs) are currently envisaged as a means to foster the provision of a broad range of non-commodity outputs emanating from multifunctional rural environments. This paper presents a Contingent Valuation survey that analyses individuals' perceptions of and willingness to pay (WTP) for the implementation of a RDP in Cantabria, Spain. Uncertainty in individuals' preferences is explicitly acknowledged and introduced into our analytical framework. For that purpose, a comparison is made between the open-ended (OE) and the multiple bounded uncertainty (MBU) elicitation formats. According to our behavioural model estimates, the expectation of a positive welfare change for both rural and urban dwellers constitutes a sound argument in favour of regional rural development policies.

1. Introduction

Sustained support to farmers in Europe since the advent of the Treaty of Rome in 1957 has resulted in severe caveats such as overproduction of subsidised agricultural products, ongoing environmental degradation and international trade distortions and disputes (Daugbjerg and Swinbank, 2007). As a consequence, during the last decades there has been a steady increase in social and political awareness of the exhaustion of the policy approach to agricultural activity focused on productivity and capacity building in this economic sector (Hodge, 2001; McVittie et al., 2010). Moreover, social demand for increased agrarian output has diverted towards an increasing demand for environmental, social and cultural "non-commodity outputs" (NCOs) that are produced as a by-product of agricultural activity in rural areas (OECD, 2001). Some of the most cited examples of this type of externalities and public goods are landscape and open space amenities, natural hazards prevention, biodiversity preservation, rural economic viability, cultural heritage, etc. (Abler, 2004).

This new scenario has come as the result of a change from a status quo social consciousness that NCOs were neither scarce nor valuable, towards a situation where the general public has become susceptible to the objective of preserving "high-quality" rural areas. Some of the factors that have triggered this change in social perceptions in developed countries are, amongst others, sustained income growth, increased leisure time and transport facilities to access rural areas, aggravation of soil erosion processes, presence of chemicals and residuals from agrarian activities in food and water, traditional landscape deterioration to favour mechanisation and the extension of crops, and loss of cultural heritage and ethnographic attributes in villages and rural areas (Bromley and Hodge, 1990; Latacz-Lohmann and Hodge, 2003).

Research efforts by international organisations such as the OECD have been directed to acquire a better understanding of the nature and extent of joint production processes -commodity and non-commodity outputs- in rural areas in general and in agriculture in particular. This objective has walked hand in hand with that of unravelling social demand for rural amenities in order to re-orientate public support to current social needs. Advances in research in both areas will certainly favour the implementation of targeted and tailored policy instruments grounded in the concepts of non-distorting production of NCOs and multifunctionality as the basis to justify, legitimate and guide public support in rural areas (OECD, 2000, 2003, 2007).

In this sense, rural areas not only support wildlife but also an economic sector that supplies food and intermediate inputs for both consumers and producers, a cultural heritage and a traditional way of life, a landscape resulting from centuries of interaction between human actors and natural processes, and an alternative place to dwell for people escaping from already congested and overpopulated urban areas. Consequently, integrating all the potential components of multifunctionality into a comprehensive policy demands a multidisciplinary approach that merges environmental, productive (agrarian and non-agrarian) and social perspectives.

Rural Development Programs (RDPs) can be thought as the response offered by the European Union to incorporate into the Common Agricultural Policy (CAP) this multifunctional and territorial perspective (EC, 2008). In this study we focus on the valuation of the social demand for RDPs in Southern Europe. To fulfil this objective we apply the contingent valuation method (CVM) to elicit individuals' preferences

concerning the implementation of a public policy (Hanemann and Kanninen, 1998), and measure the potential of RDPs to impact on social welfare by means of promoting the provision of NCOs originated in the rural areas. For that purpose, two elicitation formats are applied: the open-ended (OE) and the multiple bounded uncertainty (MBU).

The paper is organised as follows. In the next section we give a brief description of the main features of Rural Development Programs. The theoretical underpinnings of the CVM are discussed in Section 3 on basis of two elicitation formats (open-ended and multiple bounded uncertainty). In Section 4 both the valuation scenario and a general overview of the social perceptions of survey respondents with regard to RDPs are presented. The results of the estimation of summary monetary welfare measures and of the comparison of both elicitation methods are presented in Section 5. Finally, Section 6 is devoted to discussion and conclusions.

2. Rural Development Programs (RDPs)

CAP's budgetary and legitimacy crisis which led to the "McSharry Reform" in 1992 and the "Agenda 2000" in 1999 did also give birth to the conception of rural development as a "second pillar" for the CAP. On the one hand, the second pillar included all the economic efforts from the EU to promote the development of agriculture and rural areas from a multifunctional and territorial perspective, whilst on the other hand, the first pillar embodied all those mechanisms and instruments devoted to comply with the sectorial commitments of price stability and direct aids for farm producers. Accordingly, RDPs emerged as a consequence of the process of reform of the CAP's institutional framework which took place in 2003 and was subsequently reaffirmed during the "Health Check" process in 2008. In this vein, the new institutional framework has resulted in a significant increase in the set of instruments and objectives incorporated into the common agenda for rural development policies, together with the eagerly awaited announcement of an independent fund to cover the second pillar.

RDPs consist of a closed census of policy measures eligible for implementation in any Member State. Every measure is integrated into a thematic "axis" corresponding to each one of the four core multifunctional objectives to be developed in rural areas within the European Union: i) improving the competitiveness of the agricultural and forestry sectors, ii) ensuring the delivery of environmental services and preserving the countryside, iii) improving quality of life in rural areas and facilitating the diversification of rural economies, and iv) developing and implementing strategies by local actors to make good use of the long-term potential of their local areas (i.e., implementing the "Leader" approach).

Some of the most salient features of RDPs are the mandatory engagement of stakeholders in policy implementation through the Leader governance framework, the presence of voluntary participation schemes that remunerate farmers for making efforts in conservation that go beyond compulsory "cross-compliance" requirements (i.e. agri-environmental schemes), the possibility to take into account private transaction costs when calculating compensation payments, and the acknowledgement of the fact that promoting viable and sustainable rural territories can no longer be based on agricultural indicators alone (Sydorovych and Wossink, 2008). Being the latter one of the main strengths of RDPs, it is also one of its main weaknesses: having to cope with an extensive

array of multifunctional policy objectives with only a small fraction of the overall CAP pluri-annual budget.

3. Theoretical framework: Contingent Valuation Method (CVM)

In CVM applications, the individual is presented a choice between two options: the "status quo" situation, z_0, which represents the outcome that would certainly occur in the absence of any intervention at no additional cost for the individual; and the policy implementation scenario, z_1, which would result in an environmental (or other) improvement (or deterioration) in exchange for a determined economic cost (or benefit). Through the valuation exercise, the researcher offers the individual the possibility to trade an environmental (or other) improvement (or deterioration) off against a fraction of her income. In order to elicit how much having or avoiding the change is worth to the individuals, a broad set of formats has been proposed from the theoretical grounds, ranging from open-ended questions to bounded dichotomous choices and payment cards (Bateman et al., 2002). In this paper two elicitation formats are used: the open-ended format and the payment card with uncertainty.

3.1. Open-ended Format (OE)

An open-ended format requires CV respondents to state their maximum willingness to pay to secure a change implied by the implementation of the policy proposal under consideration. Let $j = 1, \ldots, J$ denote individuals who report a "valid" willingness to pay, i.e., bidders and genuine zeros; let $k = 1, \ldots, K$ denote individuals who do not report a "valid" willingness to pay, i.e., protest bids and outliers; and let $i = 1, 2, \ldots, N$, where $N = J + K$. In many CVM studies, the problem of protest bids and outliers is dealt with under the premise that WTP be estimated only from individuals who report positive bids and genuine zero bids:

$$WTP_j = \beta'X_j + \varepsilon_j \tag{1}$$

where X_j is a vector of variables likely to influence the amount a bidder (or genuine zero) is willing to pay for the Rural Development Program, β is a vector of unknown parameters to be estimated and ε_j is a random error term.

This strategy is problematic because the willingness-to-pay equation in the open-ended format is estimated on what may be termed a self-selected sample (Álvarez-Farizo et al., 1999; Garcia et al., 2009; Soliño, Prada and Vázquez, 2010). In order to resolve the problem that may result from sample selection bias, let Z_i be a latent variable that determines whether or not an individual reports a valid willingness-to-pay response (i.e. $WTP_i \geq 0$). This latent variable may be related to a set of explanatory factors as a linear equation such as the following:

$$Z_i = \alpha'W_i + \mu_i \tag{2}$$

where W_i is a vector of variables thought to influence whether or not an individual bids ($WTP \geq 0$), α is a set of unknown parameters to be estimated and μ_i is assumed to be normally distributed with a zero mean and constant variance. In this model, instead of Z_i what is observed is an indicator variable, z_i, which takes a value of 1 if $WTP_i \geq 0$ (i.e.

bidders and genuine zeros) and a value of 0 if not (i.e. protest response). Estimates of Equation (2) are used to construct the Inverse Mill's Ratio (λ_j):

$$\lambda_j = \emptyset \, (-\alpha'W_j)/[1-\Phi(\alpha'W_j)] \tag{3}$$

where $\emptyset(.)$ is the standard normal density function (pdf) and $\Phi(.)$ is the standard cumulative density function (cdf).

The Inverse Mill's Ratio is a correction term for sample selection and serves to represent the variables omitted up to now from the basic Ordinary Least Squares (OLS) estimation (Heckman, 1979). λ_j is added to the vector of independent variables in the willingness-to-pay equation (1), which is estimated in the second stage by OLS:

$$WTP_j = \beta'X_j + \gamma\lambda_j + \varepsilon^* \tag{4}$$

where γ is the covariance between the error terms in the selection equation and the willingness-to-pay equation. Equation (4) should provide an unbiased estimate of β if the selection equation is properly specified.

3.2. Multiple Bounded Uncertainty Format (MBU)

In complex policy environments such as multifunctional rural development policies, it is not uncommon to assume that the public's preferences towards policy design and implementation may not be well formed (McVittie et al., 2010). Starting from that premise, Multiple Bounded Uncertainty (MBU) formats are particularly well suited for stated preference analysis. According to Broberg and Brannlund (2008), a MBU question is a combination of a payment card (Champ and Bishop, 2006) and a polychotomous choice question (Ready, Whitehead and Blomquist, 1995; Hurley, Miller and Kliebenstein, 2006). More precisely, the MBU format can be thought of as a payment card with a qualitative level of uncertainty as an added dimension (Loomis and Ekstrand, 1997; Vossler et al., 2004) which allows contingent valuation respondents to express their degree of certainty that they would be willing to pay a specific amount to secure the benefits brought to them by a policy or program. The bid design for the payment card is based on an exponential response function of the form $(1+k)^{n-1}$ that generates a set of n bids, where $k>0$ (Rowe, Schulze and Breffle, 1996; Vossler et al., 2004). Five possible response certainty levels have been associated with each monetary threshold in the model: definitely yes, probably yes, unsure, probably no and definitely no. Therefore, with MBU data it is possible to perform a sensitivity analysis of WTP with respect to uncertainty (Broberg and Brännlund, 2008).

Once the probabilistic answers have been collected from the survey, they can be recoded as yes/no decisions. Welsh and Poe (1998) set out three recoding approaches: (i) "Definitely Yes" (DY) recodes all "Definitely Yes" responses as "Yes" and all other responses as "No"; (ii) "Probably Yes" (PY) adds an additional recoding of "Probably Yes" responses to "Yes"; (iii) "Unsure" (UN) finally incorporates "Unsure" responses to "Yes". Broberg and Brännlund (2008) add a higher bound treatment: (iv) "Probably No" (PN) recodes "Definitely No" as "No" and all other responses as "Yes".

Several alternative ways of performing the seminal approach by Welsh and Poe have been suggested in the literature (Broberg and Brännlund, 2008). For example,

Evans, Flores and Boyle (2003) assigned payment probabilities to each categorical uncertainty level. Cameron et al. (2002) and Alberini, Boyle and Welsh (2003) suggested a panel approach. Alberini, Boyle and Welsh (2003) estimated a random valuation function on the panel data and suggested that MBU format improves the efficiency of the WTP estimates if the correlation between responses on successive bids is less than one. Vossler and Poe (2005) argue against the result in Alberini, Boyle and Welsh (2003) on both theoretical and empirical grounds. Vossler et al. (2004) and Vossler and McKee (2006) employ several adaptations of the ''probably yes'' model of Welsh and Poe (1998) and the dual-uncertainty decision estimator of Evans, Flores and Boyle (2003). Since our objective is not to investigate on the econometric analysis of MBU data (nor to compare analysis alternatives for MBU data), we do not comment on these studies further.

In order to estimate response distributions and Hicksian surplus values from the MBU format, the results presented in this paper are based on the seminal approach by Welsh and Poe (1998) and the extension approach by Broberg and Brännlund (2008). Based on those uncertainty treatments, it is possible to determine the bid levels at which respondents switch between recoded "Yes" and "No" responses. Moreover, it is also possible to bind the maximum WTP of individual i from above by the lowest "no" bid determined by the arbitrary recoding procedure (A_i^H); and from below by the highest "definitely yes" amount (A_i^L):

$$A_i^L < WTP_i < A_i^H \tag{5}$$

The resulting interval that bounds the respondent's WTP can be modelled using the analytical approach developed for payment card (Cameron and Huppert, 1989) and double-bounded dichotomous choice (Hanemann, Loomis and Kanninen, 1991) data. Thus, the probability that the WTP_i lies between A_i^L and A_i^H will be:

$$Pr(A_i^L < WTP_i < A_i^H) = F(A_i^H) - F(A_i^L) \tag{6}$$

where F is the cumulative distribution function for WTP_i, $F(A^J)$ is the probability of saying no to bid A^J, and $1-F(A^J)$ the probability of saying yes, with J={H, L}. The log-likelihood function is then:

$$\ln(L)=\sum_{i=1}^{n} \ln[F(A_i^H) - F(A_i^L)] \tag{7}$$

where n is the number of individuals in the sample. Estimations of MBU intervals are performed using the bounded-likelihood function presented in Equation (7), and the standard logistic function for the cumulative distribution function. For each model, the analytical median ($-\alpha/\beta$) and the nonnegative mean ($-\ln(1+\exp(\alpha))/\beta$) values of WTP were calculated from the parameter estimates, where α represents the "grand constant" (i.e., the sum of the products of the means of the explanatory variables times their associated coefficients) and β the coefficient associated with the bid amount. The 95% confidence

intervals for the average WTPs were estimated using the Krinsky and Robb (1986) parametric bootstraping with 1000 replications.

4. Valuation scenario

The empirical analysis below is based on a contingent valuation survey designed to evaluate the social demand for a Rural Development Program in Cantabria, a region from "green Spain" that looks north onto the Cantabrian Sea and the Bay of Biscay, and is shaped to the south by the Cantabrian Mountains. Different questions were posed to the interviewees covering three main areas: (i) attitudes and perceptions towards rural development issues; (ii) policy proposal and monetary-valuation scenario; and (iii) socio-economic data.

The final version of the questionnaire was administered in May 2009 using face-to-face interviews. This survey mode was preferred given the complexity of the questionnaire, the need to show cards with visual aids and figures and the importance of controlling the order in which the different questions were presented to respondents. Previous focus groups contributed to the development of the final version of the questionnaire.

The target population was adult inhabitants in Cantabria. A stratified sample considering population size was used to obtain proportional representation of individuals residing within and outside rural areas; in a second stage, districts and households were obtained by following the random route method for households, with age and sex quotas for the final selection of individuals. A total of 317 valid interviews (n=317) were conducted by a professional survey company, with an average duration of 30 minutes. Table 1 describes the main socio-economic and attitudinal characteristics of the resulting sample.

Table 1. Variables and Descriptive Statistics

Variable	Description	Mean	Std. Dev.
HIK	Hiking last year (1: yes; 0: no)	0.4101	0.493
FUND	Public funds for farmers (1: yes; 0: no)	0.5615	0.497
NONEG	No negative repercussions from protecting high value natural areas (1: yes; 0: no)	0.6404	0.481
STAG	Stagnant rural population (1: yes; 0: no)	0.2902	0.455
ABAND	Experience with rural abandonment (1: yes; 0: no)	0.5394	0.499
INCLOW	Low income (1: yes; 0: no)	0.1609	0.368
GENDER	Female (1: yes; 0: no)	0.5142	0.501
AGE	Age (continuous variable)	47.5931	18.524
CONSER	Conservationist (1: yes; 0: no)	0.2303	0.422
INTPDR	Interested in implementation of RDPs (1: yes; 0: no)	0.5142	0.501
BENEF	Beneficiary of public support (1: yes; 0: no)	0.0221	0.147
BOTTOM	Bottom-up approach for public funding management (1: yes; 0: no)	0.2650	0.442
CULTUR	Positive impact of agriculture in preservation of cultural heritage (1: yes; 0: no)	0.5836	0.494

When asked about their past personal background and their connection with the rural and natural environment, 63% of the respondents declared to have lived during their

childhood in close contact with the traditional way of life of rural areas in Cantabria. Moreover, regardless of their present residency in rural or urban areas, 54% of the respondents stated to have lived either through a close relative or through themselves the experience of having to abandon a rural community and head for an urban area looking for new and better job opportunities. When asked about their perceptions on what is the present state of conservation of natural resources and protected areas in Cantabria, 86% of the respondents approved of the status quo. Notwithstanding, only 45% declared to have visited a protected area in the last year, and only 12% were conscious to have ever visited a "Natura 2000" protected area.

In regard to the multifunctional character of agriculture, a majority of respondents perceived a positive contribution of agriculture to the conservation of biodiversity, traditional landscapes and cultural heritage. Furthermore, the survey revealed that there is an overall social awareness of the high importance of all the multifunctional objectives covered by the RDPs. However, the data from a rating exercise included in the questionnaire has also shown that individuals discriminate amongst public interventions in rural areas and tend to rank in the first place those supportive of environmental and landscape preservation, then followed by those pursuing social objectives, and finally productive goals. This result also points out that non-market benefits take the lead in individuals' preferences regarding policy implementation in rural areas.

Respondents were also confronted with a policy scenario in which supposedly the preservation of the quality of life in rural areas, the conservation of the natural environment, and the competitiveness of the agrarian sector, depended on the actual implementation of a Rural Development Program in Cantabria. Interviewees were asked to state how certain they were that they would be willing to pay different pre-specified amounts of money annually in the form of a dedicated lump sum tax, and also the maximum amount of money they would be willing to pay every year from 2009 to 2013 to support such a program. It is from this conception of the valuation scenario and payment vehicle that we will be able to analyse willingness-to-pay responses by means of the multiple bounded uncertainty and open-ended contingent valuation frameworks. Finally, follow-up questions were included in the survey, playing an important role in helping to identify "valid" responses in the sense previously explained in Section 3 (Figure 1).
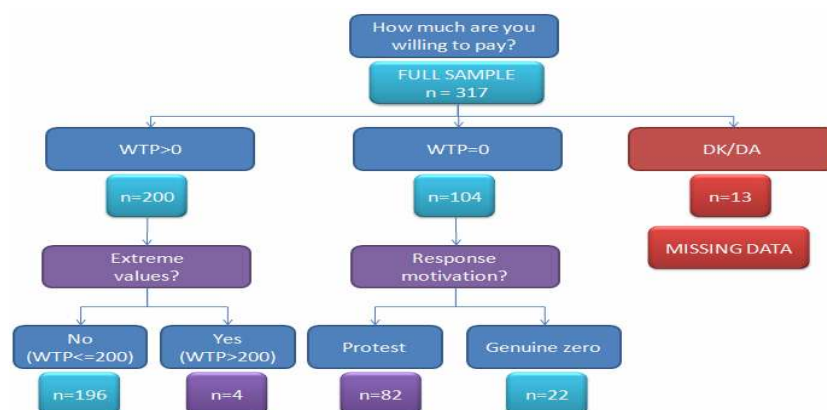

Figure 1. OE sample selection procedure

5. Results

In this section we present the empirical results derived from the estimation of the behavioural models presented in Section 3. The estimates from the probit model for sample selection are disclosed on Table 2, and Table 3 presents the results for the subsequent ordinary least squares and maximum likelihood estimates of the Open-Ended and Multiple Bounded Uncertainty models. Following Welsh and Poe (1998), to facilitate the comparison between MBU and OE models, an instrumental model for the open-ended responses has also been estimated (OE-W&P).

Table 2. Probit model for sample selection

	Coeff. (Std. Err.)	t-ratio
CONSTANT	0.054 (0.205)	0.262
HIK	0.465 (0.174)***	2.675
FUND	0.461 (0.166)***	2.778
NONEG	0.430 (0.168)**	2.564
STAG	0.468 (0.188)**	2.497
ABAND	-0.378 (0.164)**	-2.305
INCLOW	-0.410 (0.212)*	-1.930
Log Likelihood	-161.051	
Restricted Log Likelihood	-181.083	
McFadden Pseudo R^2	0.1106	
Correct Prediction	74.01%	
Number of Observations	304	

* p<0.10; ** p<0.05; *** p<0.01
Note: Dependent variable z (1: bidders and genuine zeros; 0: protest response)

Table 3. Results of the Open-Ended and Multiple Bounded Uncertainty models

| | OE | | | | MBU | | | | | | | |
| | OLS[a] | | W&P[b] | | DY | | PY | | UN | | PN | |
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
CONSTANT	22.082***	4.132	1.865***	0.512	0.015	0.660	1.151*	0.679	0.408	0.662	1.807***	0.642
ABAND	6.954***	2.334	0.317	0.286	0.488	0.358	0.197	0.359	0.561	0.347	0.169	0.344
INCLOW	-6.746**	3.398	-1.161**	0.471	0.495	0.470	-0.616	0.548	-0.819	0.548	-1.302***	0.498
GENDER	-4.705**	2.165	-0.450	0.290	0.487	0.362	-0.199	0.392	-0.093	0.379	-0.185	0.364
AGE	-0.129**	0.062	-0.010	0.008	-0.009	0.011	-0.010	0.010	0.006	0.010	-0.009	0.009
CONSER	9.187***	2.584	1.247***	0.318	0.494	0.370	0.731*	0.392	0.590	0.370	0.547	0.404
INTPDR	6.424***	2.342	0.741**	0.335	0.490	0.399	0.234	0.390	0.139	0.382	0.677*	0.356
BENEF	15.058**	7.258	0.431	0.756	0.500	0.784	3.816***	0.575	1.471*	0.784	1.484*	0.776
BOTTOM	6.061**	2.449	0.791**	0.318	0.491	0.386	0.471	0.405	0.637	0.388	0.302	0.373
CULTUR	-5.481**	2.242	-0.555*	0.290	0.486	0.374	-0.123	0.389	0.207	0.376	-0.563	0.361
BID (λ)	(-15.321)**	5.900	-0.134***	0.007	-0.058***	0.000	-0.069***	0.002	-0.065***	0.003	-0.064***	0.000
Log likelihood (R[2])	(0.2969)		1563.283		582.404		485.977		435.206		392.049	
AIC	5.557		-15.952		-5.738		-4.673		-4.125		-3.647	
N	218		196		203		208		211		215	

* p<0.10; ** p<0.05; *** p<0.01.
[a] Dependent variable: WTP$_i$ (bidders and genuine zeros).
[b] The OE WTP responses were converted to a bounded interval data set by creating a switching interval WTP$_i^*$=WTP$_i$±0.01
Note: In order to avoid negative values, genuine zeros are dropped from the subsequent analysis.

The downward-sloping non-parametric survival functions for the MBU models depicted in Figure 3 follow the expected behavioural pattern described in Broberg and Brännlund (2008): from a lower bound DY model to a higher bound PN model, the higher the level of uncertainty considered for each model the bigger the probability that an individual would be willing to pay for a specific money amount. Likewise, Table 3 shows that the LL-value increases in the uncertainty models as the certainty level decreases.
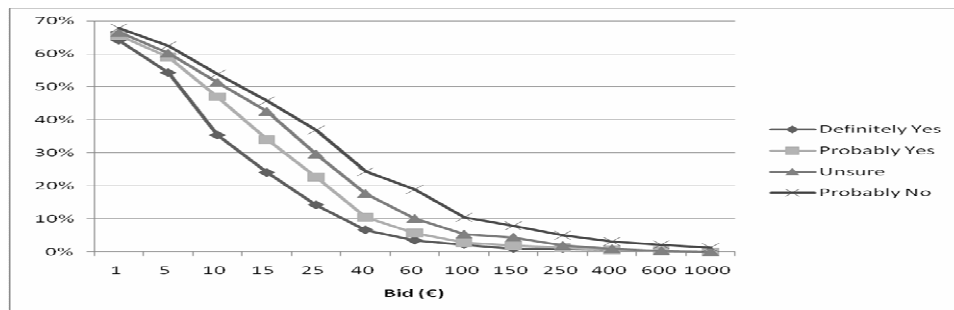

Figure 3. MBU responses distribution

When interviewees are allowed to express certainty in their willingness-to-pay responses, the estimated average mean (median) will be to some extent sensitive to the degree of uncertainty taken into consideration (Figure 4). For instance, if we look at the hypotheses tests in Table 4 no statistically significant differences can be confirmed between the mean WTP measures elicited from the OE-W&P and the DY and PY models (UN should also be added to this group if median estimates were to be considered). But when higher degrees of uncertainty are considered (i.e., UN and PN), the resulting mean WTP estimates will be statistically bigger than those from the OE model.
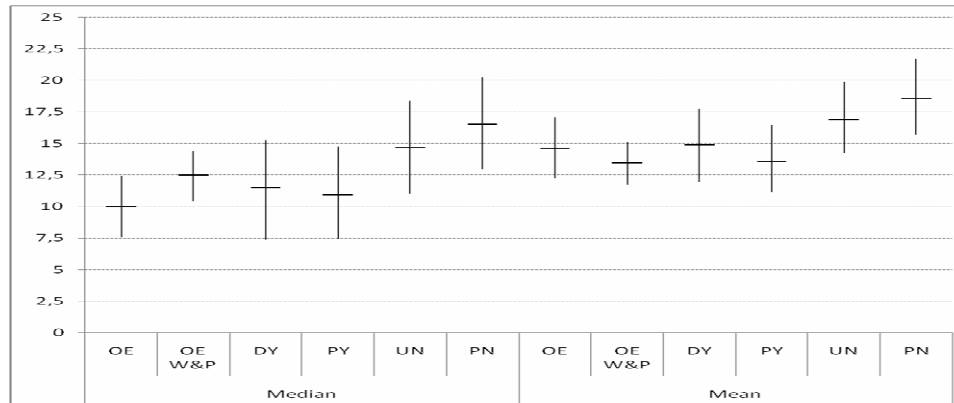

Figure 4. Comparison between OE and MBU results

Alternatively, similar insights can be gained from Table 4 by looking at the substantial overlap between the estimated confidence intervals from OE-W&P and OE-OLS models compared to those from DY and PY models. These results are consistent with those found in Welsh and Poe (1998), and confirm that respondents facing OE questions become more cautious about their answers, i.e. being prone to reveal monetary values which they feel more certain that they would be willing to dispose of. Notwithstanding, we can also deduce from Table 4 that somehow there is a close correspondence amongst average WTP estimates in our models, as illustrated by the fact that higher bound mean and median estimates from the UN model are no more than 37.9% and 32.3% bigger respectively than those for the OE-W&P model.

Table 4. Weighted average WTP (mean and median)

Elicitation format	Model	Mean WTP			t-test	Median WTP			t-test
		Mean	Std. Err.	95% CI		Median	Std. Err.	95% CI	
OE	OLS	14.65	18.295	12.22; 17.08	-	10.00	18.295	7.57; 12.43	-
	W&P	13.47	0.896	11.74; 15.07	H_0^a	12.50	1.082	10.40; 14.40	H_0
MBU	DY	14.90	1.453	11.99; 17.77	0.8309 (0.406)	11.53	1.970	7.42; 15.27	0.4274 (0.669)
	PY	13.56	1.358	11.12; 16.48	0.0546 (0.956)	10.96	1.855	7.44; 14.71	0.7062 (0.480)
	UN	16.92	1.522	14.26; 19.87	1.9167 (0.056)	14.70	1.979	11.03; 18.38	0.9552 (0.340)
	PN	18.58	1.537	15.71; 21.71	2.8029 (0.053)	16.54	1.862	12.95; 20.23	1.8305 (0.068)

Finally, it is also important to note that the transit from definite approval to definite refusal within the proposed bid sequence has been abrupt in many cases (only 25% of respondents stated more than three different uncertainty levels), not showing the idealised diagonal response pattern expected from the MBU format (Broberg and Brännlund, 2008). This particularity of the data set may indicate that individuals' find it hard to deal with uncertainty in explicit terms, especially in regard to complex subjects such as the RDPs in Cantabria.

6. Discussion and conclusions

Contingent Valuation scenarios involve policy proposals for which individuals have often incomplete knowledge and uncertain preferences about its wide range implications. Individuals facing unfamiliar and complex scenarios may adapt their responses to the sense of commitment (certainty) implicit in their self-reported values.

The first implication from our contingent valuation analysis of social demand for RDPs in Cantabria is the overall convergence of the positive WTP estimates attending to several elicitation formats and uncertainty degrees. This result constitutes a sound argument favouring the implementation of a multidisciplinary and systemic (i.e., multifunctional) rural development policy approach that tackles environmental, agrarian and non-agrarian rural development issues. This conception is also reinforced by the precautionary approach in decision making suggested by Welsh and Poe (1998) that we should depart from lower-bound contingent values expressed with a higher degree of certainty and move towards more uncertain values when, as this is the case with RDPs, there are mild consequences associated with overestimating benefits and severe consequences associated with underestimating benefits.

Notwithstanding, we feel that the robustness of the overall convergence between average WTP estimates in MBU and OE models in our study could also be influenced by the fact that, because of budgetary restrictions, we have been forced to implement both applications sequentially over the same sample of individuals. Without doubt, an independent split-sample strategy would have been the preferred approach for data gathering, and could have thwarted the risk of introducing some type of anchoring bias into the subsequent analyses.

Finally, with a population of 487,485 inhabitants, the estimated impact of a RDP on Cantabria's social welfare would sum up to more than 7 million euro per year. But, as we know from the analysis of information about social perceptions and attitudes collected in the survey, even this aggregated welfare figure should basically be expected to account for only a rough estimate of those social and environmental non-market benefits of the program.

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