

Measuring Social Preferences for Rural Development in Southern Europe

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ABSTRACT: It is a well-known result in both environmental economics and natural resources management that you will not be able to manage what you are not able to measure. This paper presents a dichotomous-choice contingent valuation survey that analyses individuals' preferences for the implementation of a rural development program (RDP) that fosters the provision of non-commodity outputs in rural areas in Southern Europe. In order to account for the fact that some of the respondents show unwillingness to pay for the program, out-of-the-market individuals have been identified. According to the results of our behavioral models, prospective positive welfare changes due to policy implementation constitute a sound argument in favor of regional RDPs. Finally, higher levels of social legitimacy and social support towards RDPs will be inextricably related to the issue of being able to communicate to the wider public what the potential outcomes and expected potential benefits of RDPs will be.

Key words: Non-commodity outputs, Rural development policy, Stated preference methods, Spike models

INTRODUCTION

During the last decades, 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; Gómez-Limón and Atance, 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. In developed countries, this change in social perceptions has been triggered by socioeconomic factors such as sustained income growth, increased leisure time and the improvement of transport facilities to access rural areas, and loss of cultural heritage and ethnographic attributes in villages and rural areas; but there are also environmental factors to reckon, such as the aggravation of soil erosion processes, presence of

chemicals and residuals from agrarian activities in food and water, degradation and loss of habitats and biodiversity (Bromley and Hodge, 1990; Latacz-Lohmann and Hodge, 2003). In this sense, the real value of rural areas should be considered taking into account together the number and diversity of natural and semi-natural habitats present in those areas, the link that exists between the natural resources the rural territory and an agrarian sector that supplies food and intermediate inputs for both consumers and producers, and the major role these areas play as a depository of cultural heritage (including cultural landscapes) and traditional livelihoods. Consequently, integrating all this factors into a comprehensive and “multifunctional” (OECD, 2001 and 2003) rural policy demands a multidisciplinary approach that merges environmental, productive (agrarian and non-agrarian) and social perspectives (Rizov, 2004). 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

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territorial perspective (EC, 2008). RDPs are structured around four core policy objectives or “axes”: the competitiveness of the agricultural sector axis, the environmental axis, the social (and economic diversification) axis and the LEADER axis, being the latter devoted to the empowerment of local stakeholders and to the implementation of locally designed rural development strategies. 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. In this study we focus on the valuation of the social demand for RDPs in Cantabria, Spain. To fulfil this objective we apply a dichotomous choice contingent valuation survey to elicit individuals’ preferences concerning the implementation of a public policy, and to measure the potential of RDPs to impact on social welfare by means of promoting the provision of NCOs originated in the rural areas. The paper is organised as follows. In the next section the theoretical underpinnings of the Contingent Valuation Method (CVM) are discussed. In Section 3 the valuation scenario is presented. The social perceptions of survey respondents with regard to RDPs and the results of the estimation of willingness to pay are presented in Section 4. Finally, Section 5 is devoted to discussion and conclusions.

MATERIAL & METHODS

Through a dichotomous choice contingent valuation application, an individual is offered with the possibility of an exchange in the form of an environmental improvement or deterioration at price (bid) A . Assuming an environmental improvement of $z_1 > z_0$, the individual’s response to the dichotomous question is a random variable with the following probability:

$$\begin{aligned} \Pr(\text{yes} / A) &= \Pr\{V(z_1) > V(z_0)\} \\ &= \Pr\{v(z_1) - v(z_0) > (\varepsilon_0 - \varepsilon_1)\} \\ &= \Pr\{\Delta v > (\varepsilon_0 - \varepsilon_1)\} \end{aligned} \quad (1)$$

where $V(z_j)$ is the individual indirect utility function associated to the program j ($j=0, 1$), $v(z_j)$ represents its deterministic component and ε_j is an independent and identically distributed (*iid*) random variable with a mean of zero.

Let $\eta = \varepsilon_0 - \varepsilon_1$ and F_η be its cumulative distribution function and assume that the utility function is linear. If we assume that the distribution function follows a logistic specification, we obtain a logit model in which:

$$\Pr(\text{yes} / A) = F_\eta(\Delta v) = \frac{1}{1 + e^{\alpha - \gamma A_i + \beta s_i}} \quad (2)$$

where α is the intercept coefficient, s is a vector of individual characteristics, β is the utility coefficient vector associated with vector s and γ is the coefficient associated with the price attribute. The model coefficients are estimated by maximum likelihood, and consistent and asymptotically efficient estimators are obtained. The mean willingness to pay (WTP) in the model is then given by the formula established by Hanemann (1984),

$$WTP = \frac{\delta}{\gamma} \quad (3)$$

where δ represents the “grand constant”, i.e., the sum of the intercept plus the products of the means of the explanatory variables times their associated coefficients; and γ being the coefficient associated with the bid amount.

In CVM applications some people do not wish to participate in the hypothetical market. A *zero-bidder* is usually considered when respondents answer that they are not willing to pay for a proposed change. These responses can reflect a genuine zero value, i.e., the offered good does not have an impact on an individual’s preferences; protests against some of the elements of the valuation scenario; or strategic behaviors. There is no consensus on how to treat this kind of responses (Jorgensen and Syme, 2000; Dziegielewska and Mendelsohn, 2007; Brouwer and Martín-Ortega, 2012). However, the usual course of action is to eliminate the answers that are identified as protests as well as others that are presumed to be of a strategic nature, whereas genuine zeros are maintained for analysis (Soliño *et al.*, 2010).

When the proportion of genuine zeros is high, it is particularly suitable to apply a “spike model” to differentiate between individuals who are *in-the-market* or not (Kriström, 1997). Basically, the spike model consists on a parametric estimation based on a specific likelihood function (equation 4) which

allows for respondents with zero WTP and positive WTP:

$$LL = \sum_{i=1}^N PAY_i YES_i \ln[1 - F(A)] + PAY_i (1 - YES_i) \ln[F(A) - F(0)] + (1 - PAY_i) \ln[F(0)] \quad (4)$$

where $F(A)$ is a continuous and non-decreasing function describing the probability that an individual's WTP does not exceed a bid A ; PAY_i is a dummy variable that takes value one if the individual i is *in-the-market*, i.e., wishes to contribute economically to the specific environmental program (and zero elsewhere); and YES_i is a dummy variable that takes value one if the individual i accepts to pay a specific price A (and zero elsewhere). If $F(A)$ follows a logit distributional form then we have:

$$F(A) = \frac{1}{1 + e^{\delta - \gamma A}} \quad (5)$$

where δ and γ are as previously defined. Accordingly, the value of the "spike", defined as the probability that WTP is equal to zero, can be derived from equation (6):

$$spike = 1/[1 + e^{\delta}] \quad (6)$$

And lastly, when the price coefficient (γ) is positive, the mean willingness to pay is to be given by the formula (7):

$$WTP = \frac{1}{\gamma} \ln[1 + e^{\delta}] \quad (7)$$

Several studies have developed the spike models. For example, Reiser and Schechter (1999) extend the spike model approach to allow for explanatory covariates. Nahuelhual-Muñoz et al. (2004) applied extended spike models to account for positive and negative preferences as well as indifference for a public good. Hanley et al. (2009) compare several modelling approaches such as an extended spike model allowing for negative values, a spike using non-negative bids and a model which considers positive

and a spike model, and this last one provided the best fit for the data.

RESULTS & DISCUSSION

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 Northern Spanish region looking north onto the Cantabrian Sea, and shaped to the south by the 'Picos de Europa' Mountains. Different questions were posed to the interviewees covering three main areas: attitudes and perceptions towards rural development issues, policy proposal and monetary-valuation scenario, and socioeconomic data.

Previous focus groups, personal interviews with rural development experts and an open-ended contingent valuation survey (Domínguez-Torreiro and Soliño, 2013) contributed to the development of the final version of the questionnaire. The final version of the questionnaire was administered in June and July 2010 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.

The target population was adult (older than 18) 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 gender quotas for the final selection of individuals. A total of 608 interviews (n=608) were conducted by a professional survey company, with an average duration of 32 minutes. Table 1 describes the main socioeconomic characteristics of the resulting sample.

According to official statistics (INE, 2010), the respondents were older, less well educated and with

Table 1. Socioeconomic characteristics

Socioeconomic characteristics	Sample	Cantabria
Women (%)	49.50	50.96
Age	48.37	42.29
Number of members in the household	2.79	2.77
Number of children (<18 years old) in the household	0.39	n.a.
Annual household income between €14,000 and €35,000 (%)	44.44	58.40
High level of education (%)	15.60	24.40
Number of individuals in the sample	608	n.a.

lower income than the general population (Table 1). However, differences in education might be affected bids only. Hunter et al. (2012) compare non-parametric methods, interval regression, modelling in WTP-space by the fact that official statistics include some technical school degrees as high level education, whilst from our survey data we have been only able to identify those individuals who graduated from college. Income level for the sample is lower than the real value of the Cantabrian population. This figure may be affected by the fact that 29% of respondents refused to state their household income level.

Interviewees were asked about the maximum amount of money they would be willing to pay every year from 2011 to 2015 to support such a program. The valuation question was performed using a choice card with two scenarios: a RDP that implies a tax increase for Cantabrian inhabitants vs. the non RDP scenario, i.e., the absence of a RDP in Cantabria (no payment). The RDP scenario is directly associated with the provision of several NCOs: the preservation of the quality of life in rural areas, the recovery and conservation of endangered wildlife and rural landscape, reduction of wildfire risk, improvement on quality of life in rural areas, and recovery and conservation of cultural heritage in the villages.

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 dichotomous contingent valuation framework. Finally, follow-up questions were included in the survey, playing an important role in helping to identify “protest” responses in the sense previously explained. According to our survey, for the general public the attractiveness of rural areas in Cantabria lies mainly on their aesthetic values (e.g., traditional landscape) (53% of respondents), together with their environmental values (e.g., biodiversity) (30%). The analysis of perceptions and beliefs of survey respondents suggests that the provision of NCOs takes the lead in individuals’ preferences regarding the design and implementation of rural development policies. Furthermore, the survey revealed that there is an overall social interest towards the implementation of comprehensive policy schemes promoting sustainable development in rural areas. Notwithstanding, a majority of our sample (89%) is not presently aware of the existence of public policies specifically designed to address the issues related to the sustainable development of rural areas in Cantabria.

When asked about their personal background and their connection with rural livelihoods, 62% of respondents declared to have lived during their

childhood in close contact with the traditional way of life of rural areas in Cantabria; 68% declared also to have spent their childhood in close contact with the natural environment; and regardless of their present residency in rural or urban areas, 21% of respondents stated to have experienced in their own selves or through a close relative the situation of having moved from a rural community into an urban area, looking for new and better job opportunities. In regard to other relevant characteristics of our sample, 46% of respondents declared that the benefits of present RDPs are expected to fall mainly on current generations; 38% have consumption habits that include ecological products; and 48% spend some of their leisure time in the countryside.

In our CVM application, four bids (25€ 50€ 75€ and 100€) were randomly presented to respondents. Those bids were selected taking into account previous findings from an open-ended contingent valuation survey (Domínguez-Torreiro and Soliño, 2013). From the initial sample of 608 respondents, dropping the “do not know” responses leaves 594 valid questionnaires. Zero bidders were identified as those respondents who did not choose the costly RDP alternative presented in the CV choice card (68.5% of sample), i.e. those respondents who chose a zero bid. From the latter group, 143 respondents (24.1% of sample) were identified as genuine zeros, because one of the following arguments for not contributing to the RDP in the contingent valuation scenario was given in the follow-up questions: “budget income constraint”, “there is no need for a RDP” or “lack of interest in rural areas”. Once the protest responses have been excluded, we end up with 330 usable records in total. Lastly, 119 genuine zeros (20.0% of sample and 36.1% of usable records) were identified as “out-of-the-market” individuals, as they declined to pay anything to secure the implementation of the RDP.

Several distributional assumptions and empirical models can be formulated to estimate the WTP of a sample of population (Bengochea-Morancho *et al.*, 2005). In this paper we estimate four behavioral models, considering (i) different econometric treatments for genuine zeros (logit and spike models) and (ii) incorporating some degree of individual heterogeneity (simple and expanded models). As we can see in Table 2, WTP measures substantially differ between the four behavioral models proposed.

Firstly, if we compared our results from the most parsimonious models with those from previous studies, we would observe that, as expected, the logit model yields lower values than the simple spike model due to the non-negative WTP constraint implicit in the latter (Bengochea-Morancho *et al.*, 2005). Mean WTP

Table 2. CVM Results

	Logit (simple model)		Spike (simple model)		Logit (expanded model)		Spike (expanded model)	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Intercept	0.584	0.030	0.368	0.001	-0.671	0.057	0.644	0.000
Bid	0.005	0.197	0.005	0.000	0.007	0.167	0.066	0.000
Main benefits for current generations	.	.	.	.	0.501	0.059	0.261	0.146
Ecological consumer	.	.	.	.	1.718	0.000	0.321	0.056
Individual income	.	.	.	.	1.453	0.000	0.454	0.026
Education	.	.	.	.	0.708	0.029	0.376	0.063
Countryside leisure	.	.	.	.	0.256	0.053	-0.180	0.044
Log likelihood	-224.963	.	-293.650	.	-173.659	.	-637.615	.
AIC	1.376	.	1.788	.	1.095	.	3.864	.
Mcfadden pseudo R ²	0.0037	.	.	.	0.2309	.	.	.
Correct prediction (%)	56.67	.	56.97	.	74.54	.	45.45	.
Spike (%)	.	.	40.91	0.000	.	.	24.37	0.000
Mean WTP -€- (Std. Err.)	112.76 (45.415)	0.013	183.90 (34.455)	0.000	129.45 (53.605)	0.016	21.40 (1.090)	0.000

figures obtained with logit models seem to be more robust than those estimated from the simple and expanded spike models.

Secondly, if we looked at goodness of fit measures such as the pseudo R^2 and the percentage of correct predictions, together with information criteria such as the Akaike Information Criterion (AIC), we could choose which of the proposed models suits best our data. Although spike models are *a priori* preferable to logit models when a high proportion of genuine zeros are present, the aforementioned criteria seem to recommend the use of the expanded logit model approach for our data, and the figure of 129.45 euros per individual and year as a reference value of mean willingness to pay for RDPs in Cantabria.

The expanded version of the logit model also shows that there could be several individual variables with a positive and significant influence on WTP. For example, the estimated coefficients in Table 2 indicate that respondents with consumption habits that include ecological products would be more willing to support a RDP, inhabitants with higher levels of income and/or education would also be willing to support this program, those who think that the current generations are the main beneficiaries of the implementation of RDP are more supportive of these kind of programs and, lastly, those who spend part of their leisure time in the countryside are also more willing to pay for the proposed program.

CONCLUSION

It is a well-known result in both economics and management that you will not be able to manage what you are not able to measure. When policy making is based on the criterion that social benefits should exceed social costs, whatever benefit (or cost) that is not being measured using money as the measuring rod that allows for the aggregation of preferences, most of the times will end up being assumed a value of zero, and consequently being excluded from policy evaluation and decision making processes. Economic valuation methods aim at bridging this gap by providing welfare analysis economic techniques suitable for a monetary valuation of non-market impacts of programs and policies. Once the economic benefits of an improvement in the provision of environmental services and public goods from rural areas have been quantified, we can hope for a proper integration of such values in rational, preference oriented and more efficient decision making processes (Bateman *et al.*, 2002; Champ *et al.* 2003; Pearce *et al.* 2006).

In the present study we have observed that consumers are not well aware of the existence of public policies targeting sustainable development of rural areas. Even though in previous rating and ranking social perception exercises (Domínguez and Soliño, 2013) Cantabrian society as a whole has proved to be fully aware of the high importance of the multifunctional objectives covered by the RDPs -and in particular those related to the environmental and social policy axes-, the lack of visibility of rural development programs might suggest that a significant percentage of individuals might find themselves eventually unwilling to pay to secure the implementation of such policy proposals. That sentiment has been neatly recorded in our empirical analysis, where 36.1% of individuals in our working sample have been identified as “out-of-the-market”, i.e., not willing to pay anything at all for the program.

Under such circumstances, modeling strategies for dichotomous choice contingent valuation studies such as “spike models” and the identification of “in/out-of-the-market” individuals have been proposed in the literature. In our empirical analysis, we have observed that flexible and parsimonious logit models can outperform the results obtained with more specific spike models, and provide us with robust estimates of welfare change measures related to the implementation of prospective rural development programs. Taking into account that funding devoted by the Regional government of Cantabria to the RDP 2007-2013 to social and environmental issues amounts annually to 8.2 million euros and that Cantabria had in the year 2007 572,824 inhabitants, the annual cost per individual during that seven year period would be approximately 14.46 euros, significantly lower than the mean reference value we have obtained as a monetary estimation of the social benefits of a program committed to the provision of NCOs in rural areas, 129.45 eur.

Another interesting result with distinct policy implications is that, irrespectively of whether the modeling approach used to analyze the contingent valuation responses differentiates between “in-the-market” and “out-of-the-market” individuals, all the models considered agree with the idea that a positive net welfare change should be expected from the implementation of comprehensive and multifunctional rural development programs in the area of study. This result would help mitigate policy makers’ fear of a loss of political support in case they needed to increase the fiscal burden of taxpayers to provide for the financial needs of RDPs. It is to be expected that such social legitimacy of RDPs should come hand in hand with an equivalent social legitimacy of tax schemes

designed to efficiently and equitably retrieve some of the additional welfare gains attributable to the implementation of sustainable rural development policies.

Finally, higher levels of social legitimacy and social support towards RDPs will be inextricably related to the issue of being able to communicate to the wider public what the potential outcomes and expected potential benefits of RDPs will be. But even if that publicising strategy succeeds, overall success of RDPs would inescapably rest also on the ability of complementary institutional campaigns to convince decision makers (i.e., farmers) to modify their behaviour according to voluntary support schemes with relevant environmental impacts (e.g., agri-environmental measures), as well as on the ability of aid schemes from the first and second pillar of CAP to sustain farmers' livelihoods and to promote sustainable farm investment behaviour, as a key element to guarantee the survival of rural communities and rural habitats throughout Europe.

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