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Testing convergent validity in choice experiments: Application to public recreation in Spanish stone pine and cork oak forests

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ABSTRACT

We perform two convergent validity tests in a choice experiment applied to public recreation in Spanish stone pine and cork oak forests. Results show convergent validity between a choice and a ranking recoded as a choice format in an experiment with three alternatives plus status quo. We also find significant differences between two payment vehicles (increased trip expenditures and entrance fee) that are included simultaneously in the choice sets. We estimate aggregated recreation values using compensating variation and simulated exchange value (maximum benefits from a potential market) measures. The latter measures account for 35–51% of the former values.

Introduction

In the last three decades there has been an effort to develop valuation techniques intended to integrate non-market benefits from ecosystems into economic analyses. These methods have been

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applied in order to assign an economic value to different non-market ecosystem benefits. Among these, public (free access) forest recreation is one of the most extensively studied subjects (Scarpa et al., 2000; Christie et al., 2007; Huhtala and Pouta, 2008; Rosenberger et al., 2012; Abildrup et al., 2013; Saelen and Ericson, 2013). Contingent valuation was originally the most widely used of all these methods, but choice experiments (CE) have attracted attention as an alternative due to the advantages associated with multi-attribute valuation. Although these methods are mainly applied to extended cost–benefit analysis, which uses Hicksian variation measures, there is an increasing interest in their use for national and ecosystem accounting, which require exchange values (Campos and Caparrós, 2016; Obst et al., 2016).

In this paper we present the results of a CE applied to the valuation of public recreation in stone pine (*Pinus pinea*) and cork oak (*Quercus suber*) forests in Spain. Based on this CE, we compare the compensating variation measure (a type of Hicksian variation) associated with a visit to these forests with the results obtained from the simulated exchange value method for the same visits (Caparrós et al., 2003, 2015). The latter method estimates the potential benefits that could be obtained from internalizing non-market services in a real market, in our case in a potential market of recreation in these forests. These results can be used in extended forest national accounting and to assess the potential that these services have for being marketed.

Estimating these measures relies heavily on the validity of the non-market valuation method used and the application of CE is questioned due to its hypothetical nature (this also applies to contingent valuation) (Hausman, 2012). In this context, convergent validity tests offer ways to validate the results from these methods by assessing whether different techniques, formats and/or characteristic of the valuation scenario converge to similar WTP estimates (Hausman, 1993). Thus, and previous to the estimation of compensating variation and simulated exchange value measures, we empirically test the convergent validity of two elicitation formats and two payment vehicles in our CE application with the aim of validating the results from the experiment.

Convergent validity of elicitation formats in CE mostly have compared rating, ranking and choice, although CE practitioners tend to prefer ordinal measures (ranking and choice) (Roe et al., 1996). Previous comparisons have given special attention to choice and ranking recoded as a choice formats, showing divergent results in earlier studies (Boyle et al., 2001; Mogas and Riera, 2001) and convergent validity in later studies (Caparrós et al., 2008; Akaichi et al., 2013). The main implication of the latter finding is that respondents make consistent choices in these experiments and practitioners get additional information from a ranking without losing the results from an equivalent choice exercise. These comparisons, except Boyle et al. (2001),[1] were performed in an experiment with two alternatives plus the status quo. In our paper, we extend this by comparing the results from a choice and a ranking recoded as a choice in a split-sample design experiment with three alternatives plus the status quo, which implies additional information and complexity in the choice task compared to previous studies.

Payment vehicles have also been compared in split-sample designs of CE (Swallow and McGonagle, 2006; Biénabe and Hearne, 2006; Nunes and Travisi, 2009; Kaczan et al., 2013). In the procedure, a question including a different payment vehicle is randomly assigned to each respondent. These studies show that WTP estimates are statistically different across payment vehicles, highlighting the need for further exploration of these divergences in CE applications. In our CE we compare two payment vehicles: an entrance fee and increased trip expenditures (due to increased gas prices), by including them in the same alternatives presented in the choice set. This particular design is inspired by previous hunting valuation studies that include both hunting trip costs and hunting fees as attributes in the same alternative (e.g., Mackenzie, 1993). We intend to identify how respondents make trade-offs between alternatives with different cost levels for the two payment vehicles presented. Thus, we perform a convergent validity test that analyzes whether the parameters (utility weights) of the different

[1] Although Boyle et al. (2001) used three alternatives plus the status quo, their experimental design was random in attributes, implying that the complete status quo alternative appeared only in some of the choice sets. This particular design is not usual in CE and has the drawback that not having the status quo alternative in all choice sets makes it difficult to obtain adequate welfare measures (Roe et al., 1996).