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Convergent validity between revealed and stated recreation demand data: Some empirical evidence from the Basque Country, Spain

David Hoyos[a,b,*], Pere Riera[c]

[a] Department of Applied Economics III (Econometrics and Statistics), University of the Basque Country (UPV/EHU), Spain
[b] EKOPOL, Research Group on Ecological Economics and Political Ecology, Spain[1]
[c] Department of Applied Economics, Autonomous University of Barcelona, Spain

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ABSTRACT

In a travel cost exercise, reported past visits to mount Jaizkibel, a natural area located in the Basque Country (Spain), are compared for convergent validity to stated intended future trips under the assumption that the natural resource's conditions will remain the same. In line with the results obtained by other studies, the empirical evidence of this application suggests that revealed preferences (RP) and stated preferences (SP) do not produce consistent data, i.e. do not achieve convergent validity. The paper deals with the convergent validity literature in continuous-choice studies by using two-staged count data models for recreation demand. Differences in preference structures and welfare estimates are tested assuming both common and different data generating processes for the RP and SP data.

Introduction

Outdoor recreation has been mainly modelled using the travel cost method, a revealed preferences (RP) method aiming at valuing recreational use of natural resources such as wildlife habitats, forests

* Corresponding author at: Department of Applied Economics III (Econometrics and Statistics), University of the Basque Country (UPV/EHU), Spain. Tel.: +34 946017019.
E-mail address: david.hoyos@ehu.es (D. Hoyos).

[1] http://www.ekopol.org.

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Table 1
Recreation studies combining RP and SP data with continuous choice models.

Authors	Year	Non-participation included?	Econometric treatment[a]	Model[b]	Distributional asumptions tested?	Convergence validity?
Englin and Cameron	1996	No	FEPD	Poisson	No	No
Bergstrom et al.	1996	Yes	Pooled data	Tobit	No	N/A
Layman et al.	1996	Yes	Pooled data	OLS, Tobit	No	N/A
Rosenberger and Loomis	1999	Yes	REPD	REP	No	N/A
Eiswerth et al.	2000	Yes	Pooled data	Poisson	No	Yes
Whitehead et al.	2000	Yes	REPD	REP, RENB	No	No
Grijalva et al.	2002	No	REPD	GNB, SUP	No	Yes
Azevedo et al.	2003	Yes	REPD	RET	No	No
Hanley et al.	2003	No	REPD	RENB	No	N/A
Egan and Herriges	2006	No	REPD	MPLN, SUNB	No	No
Whitehead et al.	2010	No	REPD	REP	No	Yes
Morgan and Huth	2011	No	REPD	REP	No	No

[a] FEPD (fixed effects panel data), REPD (random effects panel data).
[b] REP (random effects Poisson), RENB (random effects negative binomial), GNB (generalised negative binomial), SUP (seemingly unrelated Poisson), RET (random effects Tobit), MPLN (Multivariate Poisson Lognormal), SUNB (seemingly unrelated negative binomial).

or wetlands, using the costs of travel as a proxy for the price of visiting a site. Stated preferences (SP) methods, such as contingent valuation, choice modelling or contingent behaviour (CB), have also been used to estimate recreational benefits, although environmental valuation with RP methods has often been considered more reliable.

RP and SP methodologies have strengths and weaknesses. For example, RP methods may be preferred to SP methods because they are based on actual instead of hypothetical choices. RP methods rely on historical data, while SP methods' flexibility allows the analysis of new policies. On the other hand, RP methods are able only to estimate use values, while SP methods have the ability to measure both use and non-use values. Errors in RP data may refer to recall problems, digit bias and measurement error in the price variables, while errors in SP data may be due to unfamiliarity with the quality change or uncertainty about future behaviour (Azevedo et al., 2003).

In this context, pooling both types of data – also known as data 'enrichment' (Louviere et al., 2000) or data 'fusing' (Whitehead et al., 2008) – is appealing for comparing different data sources since it enables to test for differences within the same econometric framework rather than comparing results from separate econometric models. If both sets of data are proved to be combinable, RP and SP data can be enhanced by the other in order to derive more efficient welfare estimates. Some gains from combining different data sources may include the expansion of the behavioural model beyond the historical data; a better understanding of participation and market size effect of an environmental change; avoiding multicollinearity and endogeneity problems; gaining econometric efficiency; grounding hypothetical choices with real choice behaviour; and allowing testing the validity of both RP and SP methods (Whitehead et al., 2008).

Three approaches for combining RP and SP data can be found in the literature (see Whitehead et al. (2008) for a review): discrete-choice models (e.g. Adamowicz et al., 1994; Font, 2000 or Parsons et al., 1999), mixed-choice models (e.g. Cameron, 1992; Cunha-E-Sá et al., 2004; Huang et al., 1997; Kling, 1997; or Whitehead, 2005) and continuous-choice models (e.g. Englin and Cameron, 1996; or Grijalva et al., 2002). The latter approach, in which the present application is centred, combines RP data obtained with the travel cost method and SP data obtained with a CB method. Continuous-choice models typically intend to estimate welfare gains or losses due to changes in future intended number of trips as a consequence of variations in travel costs or environmental quality levels.

Table 1 summarises a number of recreation studies combining RP and SP data under this approach. These studies may be divided in three groups, depending on the econometric model used to jointly estimate RP and SP data: pooled data studies, fixed effects panel data studies and random effects panel data studies. Pooled data studies assume that each observation in the data corresponds to a different individual, i.e. they ignore correlation in error terms across respondents. Some applications include