



ELSEVIER

Contents lists available at ScienceDirect

Resource and Energy Economics

journal homepage: www.elsevier.com/locate/ree

Can unbiased be tighter? Assessment of methods to reduce the bias-variance trade-off in WTP estimation

Margarita Genius^{a,*}, Elisabetta Strazzera^b

^a Department of Economics, University of Crete, University Campus, 74100 Rethymno, Greece

^b Department of Economic and Social Research, University of Cagliari, Via Fra Ignazio 78, I-09123, Cagliari, Italy

ARTICLE INFO

Article history:

Received 10 April 2009

Received in revised form 8 March 2010

Accepted 14 July 2010

Available online 21 July 2010

JEL classification:

C35

Q25

Keywords:

Contingent valuation

Elicitation effects

Bivariate models

Copulas

ABSTRACT

This paper aims at verifying the claim, appeared in recent literature, that it is possible to control for response bias associated to the double bound elicitation method, while keeping gains in efficiency of the WTP estimates. Results from a Monte Carlo analysis lead, in general, to reject the claim; but when initial bids are not correctly chosen, the gains in efficiency are confirmed. An empirical application dealing with WTP estimation for drinking water quality improvements illustrates a case where a flexible modeling approach based on Copula distributions allows relevant gains with respect to the Single Bound estimator.

© 2010 Elsevier B.V. All rights reserved.

1. Introduction

The informational and incentive properties of contingent valuation elicitation methods have long been debated in the last two decades. The Single Bound method, where individuals respond to a one-shot question, is recognized as a method which is capable, if some conditions hold, to induce a truthful revelation of preferences, as demonstrated by Carson and Groves (2007, henceforth CG). However, its statistical inefficiency can be a serious problem, especially for small sample sizes. Asking a second voting question, with a lower (higher) price than the first, conditional to a no (yes) answer, was suggested by Hanemann et al. (1991) as a way to add statistical efficiency to the estimations while keeping the survey costs under control. Unfortunately, this may cause a serious response bias, as early

* Corresponding author. Tel.: +30 2831077414, fax: +30 28310 77406.

E-mail addresses: genius@econ.soc.uoc.gr (M. Genius), strazzera@unica.it (E. Strazzera).

recognized by [Cameron and Quiggin \(1994\)](#): using a bivariate probit to model empirical double bound data, they showed that the values obtained from the two responses were not identical, and that assuming so, would definitely produce distorted estimates. Indeed, as argued by CG, even the hypothesis of perfect correlation implicit in the univariate double bound (interval data) model is hardly credible: “Any interpretation of the information signal provided by offering to make the same Q available at two different prices implies that less than a perfect correlation between the two responses should be observed (CG, p. 195). Yet, [Herriges and Shogren \(1996, henceforth HS\)](#), adopted a univariate model – which incorporates a Bayesian updating mechanism – to detect and correct a specific elicitation effect which they refer to as “anchoring bias”. Their approach was then generalized by [Whitehead \(2002\)](#), who modeled the anchoring mechanism using a random effect probit, which allows imperfect correlation between the two responses. [Alberini et al. \(1997\)](#) resorted to the more general bivariate probit approach proposed by [Cameron and Quiggin \(1994\)](#) to analyze several data sets. Their work supports the view that the bivariate approach is helpful to signal the possible existence of different elicitation effects. Based on a Monte Carlo analysis, [Genius and Strazzera \(2005\)](#) confirmed that the application of appropriate bivariate models to double bound data can help detection and correction of elicitation effects arising from the use of this elicitation format. In addition, they showed that more flexible distributions (i.e. bivariate Copulas) as an alternative to the standard bivariate probit model, can be useful to increase efficiency of the estimates of the coefficients of the WTP equation. However, their investigation did not include the assessment of the bias–efficiency trade-off for the central tendency measures estimates of WTP: the present paper aims at filling this gap.

In their analysis of the anchoring behavioral model, HS (p. 129) argued that “even if the analysis corrects for this anchoring effect, the efficiency gains from follow-up questioning are likely to be reduced, since the effective information content of the follow-up questioning is diluted by the anchoring phenomenon”. [McLeod and Bergland \(1999, p. 122\)](#) concur with this view, and say that “the increased precision in the estimated WTP by asking a follow-up question is not as large, or even non-existent, when Bayesian updating is accounted for in the estimation”. As put forward by [Carson et al. \(2001\)](#), “the choice a CV researcher typically faces is between using an elicitation format that is unbiased but with a large confidence interval and using one that is potentially biased but with a much tighter confidence interval”. The same opinion was expressed by [Whitehead \(2002\)](#), who, based on empirical results, argued that the only case when gains in efficiency are still present after correction of elicitation effects is when the follow-up question allows for correction of a poor choice of initial bids. A completely different position was taken by [Flachaire and Hollard \(2006, FH hereafter\)](#), who claimed that if an appropriate modeling strategy is adopted, it is possible to circumvent the trade-off between efficiency and unbiasedness. If this were true, this would indeed be an important step forward for the CV discipline, in contrast with previous studies contending that when elicitation effects are present and are controlled for, the efficiency gains provided by the follow-up bid question are lost.

In the present work, a Monte Carlo experiment is conducted to test the validity of the FH claim. The FH model tackles a mix of elicitation effects in a univariate setting, along the lines of the HS model. In this paper, further Monte Carlo exercises are conducted, simulating different elicitation effects, also drawing from recent works by [Aprahamian et al. \(2007, 2008\)](#). In accordance with the theoretical hypothesis expressed by CG, and reported above, in most experiments we will assume that the WTP is generated from a bivariate process.

In addition, the paper contains an empirical application which gives an example where a bivariate model is used to detect elicitation effects. Alternative models are applied to the data and their performance in terms of efficiency of the estimates of the coefficients which are relevant for WTP measurement, is assessed. Another contribution of this paper is that it shows that the use of Copula distributions adds flexibility to the specification of bivariate models, and this can be useful to achieve efficiency gains.

The article is organized as follows: in the next section it will be seen how different elicitation effects influence the shape of the WTP distribution. Section 3 presents the econometric models analyzed in the paper. Section 4 describes the experimental design for the Monte Carlo study and reports the main results, which are further illustrated in Section 5 by means of an empirical application related to the estimation of willingness to pay for quality improvements in drinking water; section 6 concludes the paper.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات