**UNIVERSITY OF WAIKATO**

**Hamilton**

**New Zealand**

**A Monte Carlo Evaluation of the Logit-Mixed Logit**

**under Asymmetry and Multimodality**

Cristiano Franceschinis, Riccardo Scarpa and Mara Thiene

**Working Paper in Economics 23/17**

October 2017

|  |  |
| --- | --- |
| *Corresponding Author***Riccardo Scarpa**School of Accounting, Financeand EconomicsUniversity of WaikatoPrivate Bag 3105HamiltonNEW ZEALAND, 3240Email: riccardo.scarpa@waikato.ac.nz | **Cristiano Franceschinis**Department of Landand Agro-Forest EnvironmentsUniversity of PadovaPadovaITALY |
| **Mara Thiene** Department of Landand Agro-Forest EnvironmentsUniversity of PadovaPadovaITALY |

**Abstract**

The recently introduced (Train 2016) logit-mixed logit (LML) model is a key advancement in choice modelling: it generalizes many previous parametric and semi-nonparametric methods to represent taste heterogeneity for bundled nonmarket goods and services. We report results from Monte Carlo experiments designed to assess performance across workable sample sizes and to retrieve data-driven random coefficients distributions in the three variants of the LML model proposed in the seminal paper. Assuming a multi-modal data generating process, with a panel of four and eight choices per respondent, we compare the performance of WTP-space LML models with conventional parametric model specifications based on the Mixed logit model with normals (MXL-N) in preference and WTP space. Results are encouraging and support the adoption of flexible LML specifications with a high number of parameters as they seem to do better, but only at large enough sample sizes. To explore the saliency of the Monte Carlo results in an empirical application, we use data obtained from a discrete choice experiment to derive preferences for tap water quality in the province of Vicenza (northern Italy). LML models retrieve multimodal and asymmetric distributions of marginal WTPs for water quality attributes. Results show not only how the shape of such distributions vary across tap water attributes, but also the importance of being able to uncover them, considering that they would be hidden when using the MNL-N.

**Keywords**

logit-mixed logit

flexible taste distributions

panel random utility models