

”Zero” option in conjoint analysis
A new specification of the indecision and the refusal.
Application to the Video on Demand market
La scelta ”nulla” nella conjoint analysis
Una nuova specificazione per l’indecisione e il rifiuto. Applicazione al
mercato della video on Demand

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1. Introduction

In conjoint analysis literature, the ”zero” option relates to the no choice due to the inappreciation of the scenarios presented within the frame of a survey. However, the econometric specification of this no choice, called refusal, is rarely tackled. Another type of no choice is the indecision in the choice making process resulting from the similarities of the scenarios. This second concept of no choice, labeled conflict, is presented by Tversky and Shafir (1992). The latter demonstrates that the consideration of the conflict disagrees with the utility maximisation theory or the rational theory of the choice.

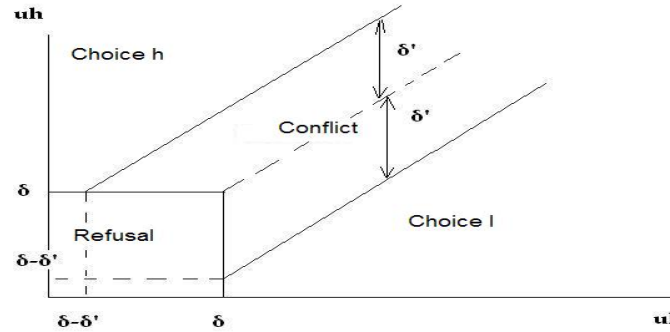
Taking into account these various elements, we propose a new specification of the ”zero” option that integrates the above mentioned concepts, the conflict and the refusal. To respect the unsuitability of the utility maximisation with the no choice, no utilities are associated with neither of the two concepts. Instead, we refer to the notion of ordered response models that governs the no choice. Our modeling of the ”zero” option is therefore a mix of specification resulting from the utilities comparison and the ordered response models. This mix associates utilities only with the products and compares them with the ”zero” option thresholds. These comparisons allow us to determine the boundaries of no choice situations.

We apply our ”zero” option model to the Video on Demand (VoD) market. The obtained results, by using a bayesian approach on the individual models and the likelihood maximisation on the aggregate model, show a good adequation of the model. The estimates are consistent with the reality and the significance of the refusal and the conflict demonstrates their importance in the decision making process. Moreover, the use of a bayesian approach for the parameter estimation gives better results than the widespread penalized likelihood.

2. The new specification of the "zero" option and its application

The specification of the model defining the choice and the two concepts of the "zero" option, i.e. the refusal and the conflict, is plotted below:

Figure 1: Representation of the choice of the products h , l and the "zero" option



where δ represent the threshold defining the refusal, δ' the threshold associated with the conflict and u_h , respectively u_l , the utilities associated with the products h , respectively to the products l .

This illustration provides the structure of the probabilities associated with each area described above and used in the log-likelihood to estimate the model parameters.

In our application to VoD, we have been confronted with separation and non convergence problems due to the small data size in the case of individual samples. The literature deals with these separation problems by using the penalized likelihood in the case of the dichotomous logit model, later extend to multinomial logit models (Bull et al., 2002). Our specification related to a multinomial probit model addresses this issue by deriving the individual estimates from a bayesian approach, while the aggregate estimates were obtained from likelihood maximisation. In fact, the latter is also used as an *a priori* information in the individual estimation with the bayesian approach. The use of this method is justified in that the results better match the reality from a statistical and economic point of view than the penalized likelihood maximisation.

3. Conclusion

Our approach brings therefore additional accuracy to the estimation of the results and to the calculations of the market shares. Additionally, it offers the perspective to better understand the consumer behavior in the decision making process.

References

- Bull S. B., Mak C., Greenwood C. M. T. (2002) A modified score function estimator for multinomial logistic regression in small samples, *Computational Statistics and Data Analysis*, 39, 57–74.
- Tversky A., Shafir E. (1992) Choice under Conflict: The Dynamics of Deferred Decision, *Psychological Science*, 6, 358–361.