Incorporating Group-Level Uncovered Structural Patterns in Estimation of Individual-Level Preferences

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Abstract

A common approach in choice modelling is to infer a preference model in form of a value function from a set of pairwise comparisons. This paper introduces an analytical framework for joint estimation of individual-level preferences of a group of customers through uncovering structural patterns that regulate general shapes of individual value functions. Results from an exhaustive numerical experiment based on simulation and analysis of real decision makers' preferences confirm that accounting for structural patterns at the group level vastly improves predictive validity of the constructed value functions at the individual level, especially when amount of preference information available is sparse. We also found that improvement in the predictive accuracy is particularly larger when considering the entire ranking of products rather than the top choice, and is invariant to the level of heterogeneity among the customers.

Keywords: *value function; conjoint analysis; convex optimization*

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