Improving latent class analysis using attitudinal responses: An application to WTP for Prosecco wine

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In Italy the most common form of public certification for quality wines are CDOs (Controlled Denomination of Origin) and TGIs (Typical Geographic Indication). TGI trademarks are governed by less restrictive production rules than those that apply to CDO ones. Relating to wines based on Prosecco variety, consumers can choose de facto between the Conegliano–Valdobbiadene (C-V) Prosecco CDO and three Prosecco TGIs. Over the last ten years, total production of bottles of the C-V Prosecco CDO has increased by 68.0% and exports by 87.6%, but a similar success happened for the Prosecco TGI wines too. The fact that the C-V CDO Prosecco is distinctive in its linkage to the name of the grape variety, makes it more vulnerable to imitation and competition from Prosecco wines produced in areas outside the denomination boundaries, making its distinction in the retail market more difficult. Hence, there is a real interest among producers to have a better understanding of the determinants of market value belonging to their collective brand compared with the Prosecco TGI ones.

In order to start investigating these determinants a survey has been carried out in the C-V Prosecco CDO production zone, where knowledge of this wine should be greater than in other places. The survey gathered data on the socioeconomic characteristics of respondents commonly used for market segmentation, wine consumption and purchase, the respondent’s WTP for a single standard bottle of Prosecco – CDO and TGI – in supermarkets, wineries, restaurants and wine shops. The total sample included 372 sets of consumer responses all randomly chosen at intercept point.

The paper explores the effect of inclusion of answers to attitudinal questions in a latent class hedonic model of stated WTP for the specialty wine Prosecco, to improve the econometric definition and latent segmentation of consumers. It adds to the existing literature in two ways. First, it provides a market segmentation by means of latent class models, based on an endogenous approach rather than one that pre-defines classes a priori. Second, preference classes are estimated by introducing socio-economic characteristics first and then answers to attitudinal questions about the purchase of Prosecco wine.

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Attitudinal questions in the analysis deal with the importance placed on different aspects influencing the purchase of wine, such as brand, price of the wine, label indicating geographical origin (whether it is TGI or CDO) and suggestions from friends or sellers (selected attitudinal questions are reported in the Appendix). We assume that the answers to these questions reflect exogenous well-behaved preferences for wine. Preferences are latent or unobserved and responses to these attitudinal questions are assumed to be the visible effect of this latent heterogeneity. The goal is to estimate the stated WTP for Prosecco wine and to characterize the differences across classes by means of a class-specific WTP model. Consumers belonging to the same class share a similar profile and have similar class membership probabilities determined by individual characteristics and responses to attitudinal questions. The estimated marginal effects on class-specific WTPs are an expression of the latent preference class structure and the expected behavior of respondents belonging to each of the identified classes.

Parameter estimations proceed by means of Pseudo Maximum Likelihood (ML). To find the ML estimates both the E-M (expectation-maximization) and the Newton-Raphson algorithm are used. Results relates to a) the comparison of different specifications, b) the choosing of the number of classes, c) the main features of the five class model, d) the individual-specific marginal willingness to pay.

The best performing model we obtained makes use of both attitudinal scores and socio-economic covariates to identify five latent classes. This model illustrates a reasonable pattern of differences in WTP for Prosecco between CDO and TGI types, which are further segregated by outlets. The fact that the same wine can be sold and bought at different prices depending on the context of purchase is a fact of life. However, we show that the magnitude of WTP differences across outlets varies and is responsible for the range of variation in prices one can observe for the same product at different outlets. The fact that attitudes are ancillary indicators of taste differences for specialty wines is of interest and of practical use in market segmentation. Our approach provides evidence that models accounting for “traditional” determinants of WTP only, perform worse than those also taking into account answers to attitudinal questions.