Quality and socio-economic determinants of Italian wine demand: a censored demand approach using microdata

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Abstract

Wine market evolved dramatically over the last three decades. One reason, among the peculiar features of this evolution, has been the significant enlargement of the premium wines. Nevertheless, consumption of basic wines in traditional, like Italy, and newer consuming countries still represents the larger market share, in volume and value terms.

Basic wine consumption is changing itself. Consumption quota of un-bottled wine purchased in wine shop or directly by producers is decreasing, while share of wine purchased in supermarkets, frequently in unconventional containers as brik or bag-in-box, is increasing. The latter can be considered as a convenience good. The market share of these wines is increasing, and wine marketing is evolving in an attempt to take into account this new, more and more, crowded market segment.

Pricing strategies of the new nature of basic wine become of paramount relevance among marketing tools. Therefore, developing a deeper and more analytical knowledge about basic wine demand is becoming of dramatic importance.

The aim of the proposed paper is to analyse basic wine demand in Italy. Other studies concerning wine demand system, used aggregated data across time and regions with no specific implementation of socio-demographic consumers' characteristics. On the contrary, our econometric model uses household consumption micro-data to distinguish among different household types (e.g. by socio-demographic characteristics). Moreover, it closely evaluates the direct impact of the socio-economic characteristics in changing wine consumption patterns.

Sample is statistically representative of Italian households. Data was collected by A.C Nielsen (a leading market research organization operating in Europe) which collects household real consumption of food products. A panel of 6,000 Italian households regularly record their purchases through a scanner (HomeScan). Each purchase record contains household identification and several quantity and quality product characteristics (brand, geographic origin of wine, POD, quality labelling such as DOC and DOCG, dimension and type of the packaging, price, store price promotion, number of purchased items, just to name some).

From an empirical point of view, according to the established consensus, demand system estimates based on household cross-section data can be cumbersome on several grounds. The two main 'dangers' are violation of theoretical regularity restrictions and possible sample selection bias due to only a fraction of the population that has positive consumption for the items under study. To solve these and also other issues a two-step censored demand system, based on the quadratic AIDS, was used.

The statistical and economic importance of censoring data has amply demonstrated, starting from the works by Gronau (1974) and Heckman (1979). In consumer demand studies the zero-food consumption problem arises because only a subset of households shows a positive consumption for the *i*-th good. If a consumption equation were to be based only on the subset, it would probably estimate a significant effect on the *level* of consumption for those covariates that, instead, affect the probability of positive consumption (a spurious relation). More formally, estimates would be inconsistent but simple procedures fix the problem, treating it as a specification error. Heckman (1979) suggests a simple two-step approach to solve the censoring problem: in the first step the probability of non-nill in the censored variable is estimated, then in the second step the new set of covariates includes the inverse Mills ratio to correct for the selection bias.

In a demand system case, since the seminal work of Heien and Wessels (1990), several empirical procedures for censored data have been developed such as those suggested by Perali and Chavas (2000) and Shonkweiler and Yen

(1999). Following Shonkweiler and Yen (1999) the zero-food consumption for a demand system of I equations is modelled as below:

$$y_1^* = (x_1\,\beta_1)\Phi(x_2\,\hat{\beta}_2) + \delta\phi(x_2\,\hat{\beta}_2) + e_1 \qquad \forall \begin{cases} i &= 1,\ldots,I \\ n &= 1,\ldots,N \end{cases}$$

and

$$e_i = u_i + (x_{1,i}\,\beta_{1,i})[\Phi(x_{2,i}\,\beta_{2,i} - \Phi(x_{2,i}\,\hat{\beta}_{2,i})] + \delta_i[\phi(x_{2,i}\,\beta_{2,i}) - \phi(x_{2,i}\,\hat{\beta}_{2,i}).$$

where $\phi(x_2\,\hat{\beta}_2)$ and $\Phi(x_2\,\hat{\beta}_2)$ are the probability density function (PDF) and the cumulative distribution function (CDF) respectively, which are obtained from a probit model using the equation 1 in the first stage,

$$y_2^* = (x_2\beta_2 + e_2) \tag{1}$$

with

$$y_2 = \begin{cases} 1 & if \quad y_2^* > 0 \\ 0 & if \quad y_2^* = 0 \end{cases}$$

and

$$y_1 = y_2 y_1^*$$

To estimate a system of I equations, an ITSUR approach jointly considers the covariance in the consumption equations. For the same reason as in the single-equation case due to the downward bias of the population variance, we also bootstrapped the standard errors.

First results show the dramatic relevance of socio demographic consumers' characteristics on brick and basic wine. While basic wine can be considered as a substitute good of brick wine, premium, super premium and higher quality wines seem not to be affected by change in brick wine price.

Key words:
Wine household consumption in Italy, censored demand system estimation, sample selection approach.
JEL classification: [D12, C31, C34]

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