Estimation of a demand system for alcoholic beverages in Santiago, Chile

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Abstract
This paper estimates a demand system for alcoholic beverages and calculates expenditure and price elasticity for the province of Santiago, Chile. To the best of our knowledge, this is the first econometric study that estimates a comprehensive demand system for alcoholic beverages in this country. The analysis is based on the linear approximation of the almost ideal demand system (LA/AIDS), augmented by non-price variables, e.g demographic and socioeconomic characteristics, included in the intercept. This model was chosen because it has a series of convenient properties, such as giving a first order approximation for any demand system; satisfying exactly the axioms of choice; perfectly aggregating consumption; facilitating the estimation; and that can be used to test homogeneity and symmetry restrictions through linear restrictions in the parameters. The estimation of the model is made through an iterative SUR (ITSUR) process, method that requires the elimination of an equation of the system. The parameters of the omitted equation are retrieved from the restrictions of aggregation, homogeneity, and symmetry. Based on the equation parameters we estimate own and cross, compensated price elasticities following Green and Alston (1991) and estimate their statistical significance using bootstrapping.

Estimates are based on aggregate purchases by individual consumer in forty-four supermarkets for thirteen beverage categories, collected monthly during one year. Beer, pisco and large format wines represented the highest average shares of total beverage expenditures, excluding soft drinks, with 12, 10 and 8%, respectively. Information about demographic came from the National Socioeconomic Characterization Survey (CASEN), carried out by the Ministry of Planning and Cooperation of Chile. Meteorological variables were constructed from information published by the Meteorological Administration Office of Chile.

The results show that non-price variables are important determinants of the demand for alcoholic beverages. For households living in a municipality of lower per capita income, expenditures are higher for beer and large format and tetra packaged wines. On the
contrary, in municipalities of higher per capita income expenditures are higher for pisco, cabernet sauvignon and white wine, and spirits. A larger proportion of male head-of-household is associated with a greater expenditure in cabernet and other red wines, and higher female population with higher white wine consumption and lower beer and pisco consumption. Supermarkets in municipalities with higher average levels of head of household education present greater expenditures on beer and higher-priced alcoholic beverages, especially scotch, rum and other spirits. Spirits and high price wines have higher expenditure elasticity but lower price-elasticity. The degree of substitutability between beer and pisco is greater than between beer and any wine category; there is no significant substitutability between pisco and any other spirit. We also find that temperature increases beer and soft drinks consumption but decreases expenditure of other alcoholic beverages. Rainfall decreases purchases of beer, soft drinks, and white wine, and increases that of pisco, red wines, scotch and rums.

**Key words:** alcoholic beverages retail demand, Almost Ideal Demand System, non-price demand determinants, demand elasticities.