Isolating the non-price and income effects in the demand for red wine in the US\(^1\)

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Abstract

Per capita wine consumption in the United States is estimated to have grown by around 1.7 per cent per annum over the past decade, increasing from 7.65 litres in 2000 to 9.15 litres in 2007 before falling to 8.66 litres in 2009. Conversely, per capita consumption of spirits in the United States over the same period grew steadily on average by close to 1 per cent per year. Per capita consumption of beer fell slightly on average by 0.2 per cent per annum but ended the period with approximately the same volume of per capita consumption as in 2000 (Anderson and Nelgen 2010). What does this tell us about alcohol consumption in the US during this time? Of course the inherent difficulty in gauging consumption data is that it provides limited information when considered autonomously of prices and offers little in understanding demand. Typically we decompose the demand for a good or service into two parts: (i) changes in quantity demanded and (ii) changes in demand. We refer to a change in quantity demanded as a movement along the demand curve in response to a change in price and we measure this by the own-price elasticity of demand. A change in demand refers to shifts up or down of the demand curve and is attributable to changes in factors other than the price of the product such as income, tastes and preferences, and the prices of substitute and complementary products. This type of response by consumers in aggregate is measured by the income elasticity of demand and cross-price elasticities of demand. Econometric models of demand systems are used to attempt to disentangle the separate effects of prices, income and other shifters of demand. However, in most instances, access to time series data that enable the estimation of anything other than price and income elasticities of demand is limited. This is especially the case for data which might, for example, include changes in tastes and preferences in its measurement.

In this paper we use an approach developed by colleagues (Tonsor 2010) for the beef market to measure just the net changes in US red wine demand over time. We apply best estimates of the own-price elasticity of US red wine demand to actual real wine retail prices and actual consumption over time to isolate the own-price effect. In other words we estimate the quantity demanded in any period assuming the real price was the only variable to change. This estimated quantity is subtracted from the actual quantity, leaving a residual which is the net effect of all possible shifters of demand. Taking this a step further, we apply best estimates of the income (expenditure) elasticity of demand to isolate the income effect, and best estimates of the cross-price elasticities to isolate the effect of changes in prices of substitutes and complements. The net residual derived from this effect is indexed back to a base year to indicate changes in underlying demand that can be ascribed to demand determinants other than prices and income. Income elasticities are almost always positive for normal goods such as wine so with rising real incomes over time we would expect an upward or outward shift in demand due to this factor.
alone. For example, a calculated index value of less than 100 (compared to a specified base year) would imply there has been a decline in the demand for wine independent of price and income changes, and vice-versa.

Empirical estimates of the own-price, income and cross-price elasticities of demand are critical components in constructing the wine demand index. These values can vary significantly depending on the method of estimation, data source and the timeframe under consideration. Hence, the conclusions drawn from this type of analysis hinge on the assumed values of the own-price, cross-price and income elasticities of US red wine demand used in constructing the index. Rudimentary sensitivity analysis is undertaken to determine the robustness of the results to the key parameter values.

The premise of this paper is to demonstrate the usefulness of constructing a demand index to isolate the non-price and income components of demand using red wine demand in the US as an example. The practical validity of the index needs to be assessed in terms of the context of other available industry information and the results of other wine demand studies. A significant proportion of the variance of an index that is unexplained may warrant further investigation to attempt to generate new measures of demand shifters such as changes in tastes and preferences. In the case of wine this may also require the consideration of the impact of quality differences on prices.

Reference

Tonsor, G. 2010 (accessed 1 March 2013) ‘Intuition and creation detail of beef demand indices’, AgManager.info
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Keywords: wine demand index, price elasticities of demand, income elasticity of demand, sensitivity analysis