



6th AWBR International Conference
9 – 10 June 2011
Bordeaux Management School – BEM – France

Italian Wine Consumers' Preferences and Impact of Taxation on Wines of Different Quality and Source

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Abstract

◦**Purpose:** *The paper aims at predicting the possible effect of taxation on Italian wine market by analyzing the structure of Italian wine demand differentiated by quality and source.*

◦**Design/methodology/approach:** *The approach adopted is an early application of the EASI demand system developed by Lewbel and Pendakur on micro data. Censoring at household level has also been taken into account by means of a Shonkwiler-Yen approach. Elasticities are used to proxy the effect of taxation on wine market.*

◦**Findings:** *High level of consumption has been found correspond to inelastic demand, opposite to more price sensitive preferences for occasional consumers. Also, wine quality affects responses to price changes.*

◦**Practical implications:** *Excises have been found not to be an effective policy for reducing alcohol abuses; it rather reduces the number of purchases for occasional consumers. Lower quality wine market would be affected more.*

Key words: Demand estimation, Excises, Censoring, Italian wine

1. INTRODUCTION

The purpose of the paper is to predict the possible effect of taxation on Italian wine market by analyzing the structure of Italian wine demand differentiated by quality and source.

The background of this study sees some relevant aspects of Italian wine economics and policy. Wine consumption in Italy is cultural. Drinking wine at each meal is part of the Mediterranean diet, in fact per capita consumption level has always registered high volumes. Nonetheless, overall consumption is decreasing –per capita consumption has reduced from 42 to 36 liter over the last decade (OIV, 2005)– in favor of a higher share of quality wines. Wine market is also getting globalized. In fact, an increasing number of foreign wines are sold into Italy: over the last decade, foreign wine shares moved from less than 1% to about 7% of the total (ISMEA, 2005).

Despite the overall reduction in per capita volumes and the structural consumption because of the Mediterranean diet culture, EU is in favor of imposing taxes on wine in support of other policies aimed at lowering alcohol consumption and limiting abuses. Most of the EU Member States have already applied excises on wine as well as other spirits. Contrarily, Italy has chosen not to apply excises on wine arguing that the income of traditional producers would get seriously affected. This argument enters into discussion, at this point, next to the position of the European Parliament, which, after having liberalized the market, is pointing to a more harmonized intra-Communitarian trade through the imposition of common duties. Different excises, in fact, could lead non-EU producers to prefer exporting to a country with minimal tax regimes.

Hence, the paper predicts the effect of excise imposition on the market of wines of different quality (color and strictness of the Geographical Indication¹) and source (Italian or Foreign) by using demand elasticities as proxies. Secondly, it provides demand estimates in order to understand the structure of Italians' preferences. The quality differentiation allows predicting different effects for different segments of the market. In addition, the effect of taxation have been calculated for segments of the population selected on the consumption level in order to verify whether the taxation can actually have effects on reducing alcohol abuses or in reducing market participation.

2. REVIEW OF WINE DEMAND LITERATURE

Demand estimation, hence price sensitiveness analysis, is fundamental in order to understand the effect of taxation. A plethora of empirical studies have analyzed alcohol consumption and the demand for various types of alcoholic beverages. However, only a few studies have focused more narrowly on the analysis of demand for wine and various types of wines (Larue et al., 1990; Pompelli and Heien, 1991; Buccola and VanDerZanden, 1997; Seale et al., 2003; Carew et al., 2004; Torrisi et al., 2006). Source differentiation and color differentiation are recurring approaches to the analysis of demand for this product; in fact, little has been done on quality differentiated wines. The question of substitution between foreign and domestic wines has been examined from several perspectives: Pompelli and Heien estimated a discrete-continuous model using a cross section of households from the United States. With household-level consumption data, they also dealt with zero consumption points. Additionally, their analysis consisted in estimating demand over two consumers segments differentiated by volumes consumed.

¹ Referring to the quality hierarchy generated by Italian Geographical Indications, quality classification, from higher to lower, consists in DOCG, DOC, IGT, and Table.

The magnitudes of own- and cross-price elasticities reported in the studies listed above, Table 1, may be considered “large”, indicating a high degree of responsiveness to own- and cross-price changes.

Table 1 – Summary of Empirical Studies of Wine Demand

Authors	Model	Types of Wines	Own-Price Elasticities ^a	Cross-Price Elasticities
Larue et al., 1990	Habit-Formation with Time-Varying Parameters	<u>Color</u> : Red & White, both Canadian & Foreign (4 goods); <u>Country</u> : Canada, France, Germany, Italy, Others, no Color Distinction (5 goods)	-1.889 (Canadian White, Pre-Structural Change); -0.671 (Canadian red, post-structural change)	-0.622 (Foreign Red vs. Canadian Red, post-structural change); 0.639 (Foreign White vs. Canadian Red)
Pompelli Heien, 1991	Single-equation, & sample selection; abstainers omitted from sample	Dependent Variables: White Only, domestic & imported (sample partitioned by heavy vs. light drinkers). Prices of red, rose, & sparkling included as explanatory variables.	-0.86 (domestic white, light users); -0.15 (imported white, light users)	-1.25 (imported red vs. domestic white, light users); 0.75 (imported vs. domestic white, heavy users)
Buccola & Vander-Zanden, 1997	Rotterdam system	Color & Origin: Oregon red & white; California/Washington red & white (4 goods)	-1.413 (Oregon white); 0.517 (Oregon red)	-1.866 (OR white vs. OR red); 1.983 (OR red vs. CA/WA red) [1.902 (OR white vs. CA/WA white)]
Seale et al., 2003	LA/AIDs, differenced with AR(1) Correction	Reds only by country: Italy, France, Spain, Australia, Chile, US, Rest of World (7 goods)	-1.63 (US); -0.27 (Italy)	-0.86 (Italy vs. US); -0.28 (Chile vs. US)
Carew et al., 2004	Source-differentiated AIDs	Color & Origin: Red & White from British Columbia, Europe, U.S., ROW & Aggregate (8 goods)	-1.78 (ROW white); -0.29 (B.C. red) ^b	-1.36 (Eur. white vs. B.C. white); 1.39 (ROW white vs. Eur. White) [no white-red cross-price elasticities]
Torrise et al., 2006	Linear AIDs with demand shifters (% volume sold on promotion & mean temperatures)	(%Red table wine by 3 major brands, private label, & other (5 goods)	-2.21 (Ronco brand); 1.10 (all other brands) ^c	-0.29 (Castellino vs. all other brands); 0.97 (Castellino vs. Tavernello)
Cuellar & Huffman, 2008	Single-equation, double log, with instrumental variables	Six varietals each of red & white wines, price points of < \$10 & > \$10/750 ml bottle.	-1.00 (Cab. Sauvignon), -2.25 (> \$10 Zinfandel), 1.07 (>\$10 PinotGrigio), -3.37 (<\$10 CheninBlanc)	Cross-Price coefficients are not statistically significant.

Our expectations, then, are positive towards significant effect of taxation on wine consumption. Nonetheless, different results could be found in Italy given the structural and cultural consumption of wine.

This study extends the wine demand literature by using a demand system with household data from Italy, and a source and quality differentiation. Consumers’ segmentation, in addition, provides different estimates for population subgroups recording different consumption intensity.

3. THE EASI IMPLICIT MARSHALLIAN DEMAND

Approaching the demand estimation for such a complex good, there is the need to account for preference heterogeneity in order to get improved prediction ability of demand models. At this purpose, Lewbel and Pendakur (2008) developed a demand approach that addresses the issues above and maintains the linear specification. The full nonlinear EASI demand system for estimation:

$$w^j = \sum_r b_r^j y^r + \sum_t g_t^j z_t + \sum_{t=2} h_t^j z_t y + \sum_k \alpha^{jkt} z_t \ln p^k + \sum_k \beta^{jk} \ln p^k y + \varepsilon^j \quad (2)$$

where:

$$y = (\ln x - \sum_j w^j \ln p^j + 0.5 \sum_j \sum_k \alpha^{jkt} z_t \ln p^j \ln p^k) / (1 - 0.5 \sum_j \sum_k \beta^{jk} \ln p^j \ln p^k) \quad (3)$$

Where w is the market share, y is the total wine expenditure, p is the price, and z refers to the individuals' socio-demographics. The parameter a measures the price sensitiveness of w , b_r controls the shape of Engel curves (relationship between share and expenditure) through an additive function, r is the corresponding exponent varying between -1 and $j-1$, $r = 0$ it is excluded (Pendakur, 2008). The intercept is represented by z_0 , the term g_t represents a socio-demographic intercept shifter; h_t represents the Engel curves socio-demographic slope adjuster (Lewbel, 1991; Lewbel and Pendakur, 2008; Pendakur, 2009).

Cross-equation restrictions provide theoretical properties to the estimated demand. More specifically, the required adding-up and homogeneity conditions are satisfied by imposing $\sum_j b_r^j = 1$, $\sum_j b_r = 0$ for $r \neq 0$, $\sum_j \alpha^{jkt} = \sum_j \beta^{jk} = \sum_j g_t = \sum_j h_t = 0$, and $\sum_j \varepsilon = 0$, while symmetry of α and β matrices ensures symmetry.

4. ACNIELSEN WINE HOMESCAN DATA

The data employed are drawn from the ACNielsen Italian Homescan. The particular sample of 6,701 households includes unit prices and quantities consumed of all types of wine over the two-year period from December 2002 to December 2004; expenditures on all other types of beverages and food are not included. Socio-demographic variables for each household are also included.

Despite widespread consumption of wine in Italy, 1,551 households (23.1% of the total) made no purchase of wine during the two years. Nonetheless we cannot state whether those consumers are abstainers or their wine consumption has not been recorded.

Wines are classified by source categories, Italian and Foreign and color. While Italian red and white wines follow a sub classification into four categories based on different types Geographical Indication (GI): IGT (*Indicazione Geografica Tipica*); DOC (*Denominazione Di Origine Controllata*); and DOCG (*Denominazione Di Origine Controllata e Garantita*), foreign white and red wines are included in just one category. These geographical indications are designed to assure consumers that specified production methods and quality disciplines have been adhered to and thereby indicate a quality hierarchy which is stricter and stricter going from IGT to DOCG. Not all wines are of GI, common table wines, subsequently indicated as *Table*, are produced without a recognized quality discipline and, therefore, the law establish that they cannot use any quality signaling onto their labels.

TAB. 2 – Prices and Budget-shares descriptive statistics of the sample

		Price				Budget-share	
		Average	St.dev	Min	Max	Average	St.dev
Red	Foreign	5.19	0.77	1.19	32.29	0.009	0.063
	DOCG	7.05	2.71	1.33	50.67	0.020	0.091
	DOC	3.73	1.32	0.25	38.72	0.177	0.259
	IGT	3.03	1.16	0.14	25.93	0.107	0.204
	Table	1.58	0.72	0.09	13.33	0.199	0.295
White	Foreign	6.39	2.53	2.65	22.51	0.002	0.030
	DOCG	5.52	1.78	0.61	23.87	0.006	0.045
	DOC	3.95	1.72	0.29	48.00	0.117	0.220
	IGT	2.88	0.93	0.32	10.00	0.049	0.142
	Table	1.29	0.73	0.04	21.30	0.314	0.354

5. ESTIMATION

The estimation of the EASI model has been carried out with a robust seemingly unrelated regression (SUR), which contrarily to the estimator adopted by Lewbel and Pendakur, given the cross-sectional nature of our data, corrects for heteroscedasticity.

Moreover, in order to account for censoring, we adopted the approach developed by Shonkwiler and Yen whereby the density and distribution functions from a binary choice model¹ are used to adjust for censoring (Shonkwiler and Yen, 1999; Mutuc et al., 2007).

$$w^j = \Phi^j(\mathbf{z}, \delta) (\Sigma_r b^j_r y^r + \Sigma_t g^j_t z_t + \Sigma_{t=2} h^j_t z_t y + \Sigma_k \alpha^{jkt} z^t \ln p^k + \Sigma_k \beta^{jk} \ln p^k y) + \tau^j \phi^j(\mathbf{z}, \delta) + \varepsilon^j \quad (11)$$

Where the distribution, $\Phi^j(\mathbf{z}, \delta)$, and density, $\phi^j(\mathbf{z}, \delta)$, functions depend on explanatory variables, \mathbf{z} and associated parameters, δ . Elasticities estimates, by consequence need to premultiplied by the distribution function.

6. EMPIRICAL ANALYSIS AND RESULTS

In order to understand the effects on households showing different level of wine consumption estimation has been carried out for quartiles of consumption having the following classification: occasional consumers (0.5-6 liter/sample period), infrequent (6.1-16.75 liter), frequent (16.76-50 liter) and heavy consumers (50.1-1351 liter). The division concerns the quartiles for volume consumption, thus the number of consumers included in each group diminishes proportionally from the first to the last group. Finally, average prices across segments results similar.

Estimation has been conducted obtaining a good variability explained by the model, more than 22% for every equation, in line with the existent empirical demand literature. Demand own- and cross-price effect are used to proxy the effect of excise and to better understand consumers' preferences and quality switch in case of price changes.

Own-price elasticities at each quartile show that going from occasional to heavy consumers, price effects are generally smaller. Own-price elasticities show high values in the first two quartiles. Looking at price effects relative to the wine typologies it is possible to notice a certain degree of substitution between foreign and DOCG wines, both for red and

¹ The model used is an heteroscedasticity consistent probit.

white wines. DOCG Italian wines, therefore, seem to be the most vulnerable category to foreign competition; in fact, they compete in the same price segment, as show by average prices in tab. 2. This effect is stronger and more significant in the first two quartiles. A certain degree of substitution has been found also between white IGT and white Table wines. When white Table wine price increase, consumers might switch to higher quality wines such as white IGT. This result is valid at all quartiles. Households of the first three quartiles could substitute for almost any other wine typology when Table wines are sold to higher prices.

Estimated price effects give useful indications relative to the consequence of excises on wine consumption and on composition of households' wine bundles.

TAB. 5 - Compensated Price Effects, evaluated for reference type household with mean expenditure at base prices (Bold face are significant at 95%).

Consumers' segment	Wine Typology	Budget-share price semi-elasticities									
		Red Foreign	Red DOC	Red DOCG	Red IGT	Red Table	White Foreign	White DOC	White DOCG	White IGT	White Table
Consumers (between 0.5 and 6 liters over the observed period)	Red Foreign	-1.076									
	Red DOC	0.417	-1.171								
	Red DOCG	1.390	0.377	-2.009							
	Red IGT	0.534	0.209	0.105	-2.298						
	Red Table	0.143	0.075	0.101	0.204	-1.881					
	White Foreign	0.734	-0.147	0.237	0.016	0.420	-4.730				
	White DOC	0.089	0.066	0.018	0.239	0.212	0.137	-1.623			
	White DOCG	-2.028	0.306	-0.211	1.086	0.862	2.358	0.336	-4.633		
	White IGT	0.850	0.402	0.396	0.615	0.051	-0.817	0.121	1.097	-2.635	
White Table	0.448	0.501	0.298	0.479	0.200	0.048	0.616	0.085	0.833	-3.508	
Occasional Consumers (between 6.1 and 16.75 liters over the observed period)	Red Foreign	-1.648									
	Red DOC	-0.056	-1.725								
	Red DOCG	0.678	0.154	-2.078							
	Red IGT	0.624	0.366	0.479	-2.114						
	Red Table	0.163	0.174	0.236	0.477	-3.039					
	White Foreign	-0.960	-0.214	0.494	0.129	0.002	-0.379				
	White DOC	0.144	0.440	0.159	0.500	0.640	0.147	-2.771			
	White DOCG	0.506	-0.066	-0.357	0.105	0.276	1.255	0.101	-2.528		
	White IGT	0.729	0.584	0.221	0.620	0.702	0.014	0.456	-0.192	-3.537	
White Table	0.267	0.356	0.106	0.444	0.274	0.158	0.703	0.185	0.594	-3.085	
Frequent Consumers (between 16.76 and 50 liters over the observed period)	Red Foreign	-0.002									
	Red DOC	0.139	-1.572								
	Red DOCG	0.101	0.037	-0.301							
	Red IGT	-0.036	0.107	0.016	-0.517						
	Red Table	-0.751	0.713	0.168	0.190	-1.695					
	White Foreign	0.188	-0.111	-0.264	-0.002	-0.870	-0.436				
	White DOC	-0.044	0.195	0.155	0.097	0.489	0.249	-2.037			
	White DOCG	-0.519	0.043	-0.030	0.105	0.459	0.485	0.089	-0.673		
	White IGT	0.682	-0.028	0.560	0.235	0.405	-0.186	0.447	0.369	-2.708	
White Table	0.284	0.408	0.150	0.446	0.752	0.607	0.659	0.332	0.342	-3.981	
Heavy Consumers (between 50.1 and 1351 liters over the observed period)	Red Foreign	-0.537									
	Red DOC	0.151	-0.589								
	Red DOCG	0.063	-0.032	-0.205							
	Red IGT	-0.040	0.000	0.156	-0.376						
	Red Table	-0.048	0.159	-0.073	0.251	-0.428					
	White Foreign	-0.243	0.123	-0.075	0.123	-0.028	-0.339				
	White DOC	-0.001	-0.054	0.091	0.212	0.060	-0.054	-0.231			
	White DOCG	0.370	-0.050	-0.227	0.147	0.392	0.379	0.007	-0.849		
	White IGT	0.141	-0.050	0.290	-0.006	-0.028	-0.016	0.142	0.014	-0.385	
White Table	0.273	0.443	0.263	-0.172	-0.272	0.093	0.250	-0.126	0.343	-1.094	

Looking at the magnitude of price effects a first deduction concerns the fact that occasional and infrequent consumers would be the most affected, in terms of volume of wine consumed. In terms of expenditure on wine, frequent but especially heavy consumers would be seriously affected. Their demand is almost inelastic, thus, a price increase would generate a reduction in consumption. When imposing excise duties the objective of the government is reducing volumes of alcohol consumed and avoiding abuses. Given the price effects information obtained in this research we conclude that excise imposition would reduce wine consumption

mostly for occasional and infrequent consumers, not much for frequent and heavy consumers. Therefore, the government taxation could not be highly effective, by contrast, would affect consumers' welfare, in monetary terms.

Another consideration concerns the fact that excises are per volume duties. Consequently, lower price wines would receive a higher price increase in percentage terms, the opposite for expensive wines. We deduce that this rationale allows forming expectations on Italians' wine bundle composition changes.

7. CONCLUSIONS

The hot debate about excise imposition on wine consumption in Italy has reasons to exist. Justifying taxation with a lower consumption is not entirely true because infrequent consumers would be those that will be affected the most. Producers that are going to be affected the most are table and DOCG wine producers, because less wine of these categories is going to be consumed on the market. While the reduction of lower quality wine could be an incentive to producer to move up to the next quality level with their production, a different situation stands for DOCG consumption. Those wines are the most traditional and reflect the cultural background of a specific wine production in a given area. The decrease in consumption of those wines will truly affect traditional producers, as stated by national government in the debate. This result could, in fact, be used as support to the statement.

Imposing taxes on a beverage which consumption has cultural roots, on the other hand, will increase governmental revenues, but the reduction in wine consumption especially for infrequent consumers, does not reduce the abuse of alcohol.

The effect of excises in terms of a harmonization of intra-European trades is a question we procrastinate the answer to further studies.

The dataset used is rather far away in time. We do not expect great differences in terms of estimates although during the last decade wine bundles have been changing. Foreign wine results, on the other hand, are expected to be different as more wine from new world countries has been consumed into Italian market.

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