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Picking out a wine: Consumer motivation behind different quality wines choice

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Abstract

The quality scale of Italian wines is mainly organized in four categories: PDO, PGI, basic and bulk wine. Our analysis explicitly investigates the patterns and determinants of consumption for these four different types of wine by analyzing a representative sample of consumers from a traditional wine-producing country. This study provides for first time insights on quality perceptions of wines and verifies whether Italian consumers perceive significant differences among the different categories of wines. The overall results, obtained through a system of equation estimates, show that consumer motivations and wine consumption determinants change according to each different range of wine quality and thereby support a hierarchical scale of quality wines, as a fact consumers' motivation progressively changes as the quality scales of the wine increase or decrease. In addition, this study highlights for first time any differences in the consumption determinants between the PDO and the PGI wines in a national context and it suggests that the influence of the two different GI labels on the wine choice of consumers is truly different. Important insights were also provided for bulk wine whose consumption seems to be closely related to wine tourism and the desire to buy locally produced wines.

Keywords: Basic wines; Bulk wines; Local wines; PDO; PGI

Introduction

The information processing mechanism that consumers employ to differentiate high-quality food products from lower-quality ones has been analyzed in several studies (Jacoby and Olson, 1985; Steenkamp, 1987; Zeithaml, 1988). In line with these early studies, other authors specifically explored the role of consumers' expectations on the quality perception of wines (Fotopoulos and Krystallis, 2001; Verdù Jover et al., 2004; Johnson and Bruwer, 2007). More recently the quality of wines has been investigated from different points of view, including analyzing their geographic origin and typicality (Martinez-Carrasco et al., 2005; Spielmann, 2015), examining their price and sensory characteristics (Combris et al., 1997; Angulo et al., 2000; Lecocq and Visser, 2006; Ashenfelter, 2008; Veale, 2008), and taking into account the role of awards, wine brand, and producer reputation (Orth and Krška, 2001; Lockshin et al., 2006; Caracciolo et al., 2016; Schimmenti et al., 2016).

According to recent literature, wine quality assessment is mainly based on extrinsic cues (Sáenz-Navajas et al., 2013; Schäufele and Hamm, 2017). Indeed, the intrinsic characteristics of a wine can only be appreciated by consumers after its consumption. Moreover, since extrinsic cues can affect quality expectations, they may also influence the perception of the intrinsic characteristics once the wine is tasted. Therefore, the qualitative labelling of a wine represents one of the main

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discriminating factors for wine selection. Over the years European regulations have pushed up the quality standards of many food products. With this aim on 10 December 2010 the European Commission adopted the "Quality Package" for food and agricultural products. The Quality Package was the first step in the revision of the quality policy for agricultural products and resulted in the adoption of new quality legislation (Regulation (EU) No 1151/2012). In particular, in order to specify the geographical indication of food products, the European legislation introduced PDO and PGI logos, which are the Protected Designation of Origin and Protected Geographical Indication, respectively. These designations were also successively extended to wines (Di Vita et al., 2014a). Nevertheless, the wine market does not only include premium wines, such as PDO and PGI wines; considerable proportions of the market in traditional wine producing countries are covered by non-premium wines such as basic and bulk wines.

Notwithstanding, much of the literature has focused on high quality wines, and little attention has been paid to the non-premium wines that are characterized by medium- or low-quality levels (Cembalo et al., 2014). Therefore, it would be interesting to extend the analysis also to these low-end wine categories and compare the main determinants that influence the wine choice based on different quality levels.

Our analysis specifically focuses on Italian wines. Italy is one of the most important wine-producing and wine-consuming countries, and it has a very important place in the international wine trade. Moreover, Italy is an interesting case to analyze since the production of premium and high-end wines coexists in Italy with low-end wine production and both categories have a relevant domestic market share. The latter wine category accounts for a wide market share, both in sales volume and value[1] (Cembalo et al., 2014). The quality hierarchy pyramid of Italian wines is organized in four categories in which PDO wines are considered as higher quality than PGI wines. Our analysis explicitly investigates the lower quality levels, namely basic and bulk wines. Even though they do not comply with the official requirements of the PGI wine regulations, they represent an important segment of the national market (Cembalo et al., 2014).

The main objective of this study is to examine the patterns and determinants of consumption for the four different types of wine by analyzing a representative sample of consumers from a traditional wine-producing country, even though wine production and consumption appear to be firmly consolidated.

Although a large strand of the literature has examined the motivations and choices of consumers with regard to PGI wines, there are still further elements to be explored by comparing simultaneously the various wines with different degrees of quality and identifying the main motivations behind their consumption choice. In this sense, even though previous studies have analyzed the effect of PGIs on wine in terms of price elasticity changes (Stasi et al., 2011), it is still unclear whether consumers show different purchasing behaviors for wines differentiated according to geographical certifications.

Indeed, since previous literature identified the existence of high-quality differentiation of the wine market (Costanigro et al., 2010; Cembalo, 2014; Caracciolo et al., 2016), from the consumer side we hypothesized that the determinants of wine consumption are different (or have different impacts) as the hierarchical level of wine quality changes.

Finally, this study explores for the first time the main determinants of wine consumption and in doing so focuses also on the low-end wine categories (basic bottled and bulk wines).

Literature review

This section presents a brief overview of the main empirical findings about consumers' quality perceptions and the motivations behind their choice of wine. To this aim we reviewed the most important contributions to consumer studies involving different wine categories. The review is conceptually organized following a four-level hierarchy, comprising: PDO and PGI wines, included in the premium wines category; and two low-end categories, basic and bulk wines, which are generally known as non-premium wines (Cembalo et al., 2014; Caracciolo et al., 2015).

Jointly the four wine categories represent the main typologies available in the Italian wine market. PDO and PGI wines are certified and disciplined by the European Union regulations, whereas basic and bulk wines are not subjected to any regulations or production schemes, and they only need to comply with the current EU regulations on hygiene and food safety (Fig. 1).

A recent strand of the literature on wine consumers' perceptions has pointed out the high consideration that drinkers have towards the geographical indication(GI) of wines (Skuras and Vakrou, 2002; Galati et al., 2017). In recent decades there has been increasing interest in the GI issue in the food economics literature, and many authors have directed their studies to detecting consumer behavior towards GI products (Van der Lans et al., 2001; Josling, 2006; Moschini et al., 2008; Urbano et al., 2008). GI products generally benefit from a higher market price and convey to consumers higher intrinsic and extrinsic quality attributes. With few exceptions, such as the cheese market (Bonnet and Simioni, 2001), the economics literature indicates that the PDO label is quite relevant in the food choices of a large number of consumers.

More specifically, Van der Lans et al. (2001) showed that the origin cue and PDO label influence the preferences for regional products, but their effects are limited to specific consumer segments of the market. As a consequence, origin has a "*direct effect as indicator of quality among the consumers of the same products' area (region) of origin, probably due to the affective feelings that consumers have regard to the area of origin.*" The relevance of the regional origin has been recognized in several studies that have focused on the effect of GIs on wine preference and choice; these studies argued that a product's country of origin may have a strong influence on the acceptance and success of particular wines (Famularo et al., 2010; Caracciolo et al., 2015).

[1]The volume of non-premium wines (basic and bulk wines) is higher (56.9% vs 43.1%) than for premium wines (Ismea, 2017).

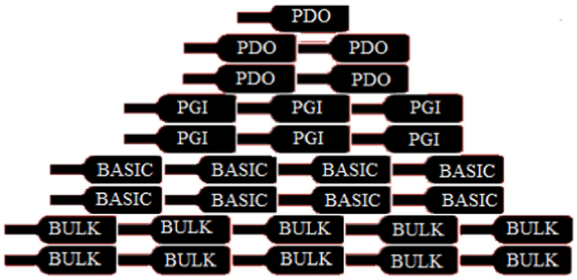

Fig. 1. The four-level hierarchal classification of wine.

PDO and PGI wines have different quality standards. PDO wine must be traditionally and entirely manufactured (prepared, processed and produced) within the specific region, while PGI wine must be traditionally and at least partially manufactured (prepared, processed or produced) within the specific region. In both cases they have characteristics of uniqueness, but PDO certification certainly emerges as a superior quality label.

In the wine economics literature, PDO and PGI production have been examined mainly as a single category, without distinguishing one from the other. Although the studies have observed quite different quality awareness for PGI and PDO products (Verbeke et al., 2012), no significant distinctions between these two categories have been clearly argued in respect of wine consumer behaviour. In this context the consumers' preference for origin-labelled wines, such as PDO and PGI, has been widely discussed and many authors have shown that consumers place value on the origin of food products (Espejel and Fandos, 2009; Espejel et al., 2011; Charters and Spielmann, 2014).Through an analysis of wine consumers' willingness to pay (WTP), Skuras and Vakrou (2002) argued that WTP varies according to the social and demographic characteristics, and consumer decisions are strongly affected by education and affiliation with the place of origin (Skuras and Vakrou, 2002).

A recent study highlights that GIs constitute a successful differentiation tool in the agro-food markets (Malorgio et al., 2008), but the amount of the price premium related to the geographical indication varies rather significantly among different products. In addition, when the price is the same, consumers prefer to purchase products with the PDO label, whereas when the price is different, *from cheap to expensive wines, with the same level of quality induces reputation premia to move from collective names (viticultural areas) to brand names (specific wineries)* (Costanigro et al., 2010).

In the same way, a direct relationship between the extrinsic attributes and loyalty has been detected in traditional food products' consumers and it has been shown that the association of perceived quality with the intrinsic characteristics of products positively influences the buying intentions (Espejel and Fandos, 2009; Josiassen et al., 2008; Espejel et al., 2011).

A recent study observed how PDO and PGI certification is crucial in the formation of the wine price, since certified wines receive a premium price that is increasingly higher as the price level of the wine increases (Di Vita et al., 2015). In this direction Deselnicu et al. (2011) observed that minimally processed foods with short supply chains and a wide number of producers receive higher premium prices. Conversely, the price premium is smaller for processed products with a well-established firm brand (Deselnicu et al., 2011).

Although premium wines, such as PDO and PGI products, seem to be the most appreciated in the international market, basic wine plays a very relevant role in the marketing strategies of wineries in many producing countries (Caracciolo et al., 2016). The demand for basic wine in Italy has been deeply analyzed by Cembalo et al. (2014), who argued that the non-premium wines market is complex since they observe a significant degree of heterogeneity. These authors paid specific attention to the difference in elasticities, as the elasticity is lower for carton wine but is higher for non-brand wine packaged in cartons. As a consequence, the brand represents an effective tool of diversification for wines in this segment (Caracciolo et al., 2016); indeed, in a study carried out on the consumption of Sicilian wines, the authors argued that the effect of the brand on price formation seems to have a significant impact for low-end wines, whereas it has no specific impact on the price mechanism for high-end wines (Di Vita et al., 2015).

There is a relative paucity of published papers on bulk wine consumption. Nevertheless, despite bottled wines being the most consumed wines, both in producing and importing wine countries the consumption of bulk wine persists and takes place in traditional producer countries (Brunner and Siegrist, 2011). This trend is confirmed by a current study carried out by OIV, which showed that in recent years the global export volume and values of these wines have significantly increased (OIV, 2017).

The role of bulk wine was also examined in a study concerning the business practices of wine owner-managers in order to increase the market share of their products (Remaud and Couderc, 2006). In particular, this study examined the strategy developed by wine companies to base their core business on brokering; that is, selling their bulk wine as subcontractors to other wine firms. However, no study has examined in depth the demand for bulk wine and the consumers' preferences for these wines.

Further studies on bulk wines can be important for wine producing countries because a large proportion of wines are still marketed in this way. Bulk wines can play an interesting part in the development of rural tourism economies, since the consumption of bulk wine still continues in those areas where the wine production and wine reputation are high (ISMEA, 2017). For local wine in particular, wine consumers have shown a high appreciation not only for bottled wine but also for bulk wine (D'Amico et al.,2014a; D'Amico et al., 2014b). This study aims to contribute to filling the gap in the literature by extending the analysis of wine consumption motivations to low-end wine categories.

Data and methods

Data

A survey covering more than 1200 Italian wine consumers was conducted specifically for this study. The survey collected information in the following broad categories. First, the respondents' socio-demographic characteristics were recorded, such as the level of education, and household income. Second, the respondents' general attitudes, attribute preferences, and consumption motivations behind their wine choices were obtained. The types of wine purchased and the description of the consumption modalities were covered in this category, including the main factors influencing their choice and the consumption of wine, styles, and places of purchase and consumption. Third, the frequency of wine consumption was obtained for the four typologies of wine, which are characterized by the different quality levels.

The four categories are:

1. Bulk wines;
2. Basic wines;
3. Protected Geographical Indication (PGI) certified wines;
4. Protected Designation of Origin (PDO) certified wines.

Following the definition of Anderson and Nelgen (2011), the bulk wines category includes wines sold in containers exceeding two liters. The basic wines category includes bottled or other packaged wines (glass and carton) with an average price below € 3/liter. (Cembalo et al., 2014).

The PGI certified wines and PDO certified wines both have a strong territorial identity distinctiveness, with the PDO wines showing higher quality characteristics and a value image. Both categories respond to the specifications outlined in Regulation (EU) No 1308/2013.

Methodology

This section describes the econometric model implemented to analyze the motivations of Italians beyond the consumption decision for the four wine categories. The empirical strategy involves developing a system of linear equations with censored dependent variables (Cameron and Trivedi, 2005) with the aim of estimating the effects on the consumption of the different types of wine (i.e., the monthly consumption of basic (i), bulk (ii), PGI (iii), and PDO (iv) wines) from a wide set of possible determinants. By their nature, data on wine consumption are characterized by high frequency of dependent variable censored at zero (null consumption), especially when the overall consumption is split into specific wine categories. This condition requires a different handling of the data.

The list of all the variables, their definitions, and the descriptive statistics are reported in Table 1. The variables include:

a) The socio-demographic characteristics of the consumers;
b) Variables expressing the consumers' preferences towards the various intrinsic/extrinsic attributes of the wine;
c) Variables reporting the respondents' consumption habits and motivations to consume wine;

Table 1
Description and summary statistics of the explanatory variables.

Variable	Description	Mean	Std.dev	Min	Max
K: Socio-demographic characteristics					
Age	Age of the respondent	48.008	12.669	18	82
Education	0 no education; 1 primary; 2 secondary; 3 high school; 4 bachelor	3.404	0.683	0	4
Income	Household income: 0 max 15,000 euros; 1 between 15,000 and 30,000 euros; 2 between 30,000 and 50.000 euro; 3 more than 50,000 euros	1.356	0.811	0	3
Gender	0 male; 1 female	0.274	N.A	0	1
Z: Habits and motivation of consumption					
Between meals	Importance of consuming wine between meals: 1 not important, 3 very important	1.428	0.664	1	3
Restaurant	Relevance of wine consumption place/restaurant: 1 not relevant, 6 very relevant	3.336	1.410	1	6
Advertising	Relevance of advertising in encouraging purchases: 1 not relevant, 6 very relevant	2.454	1.305	1	6
Guides	1 if wine guides are used, 0 otherwise	0.243	N.A	0	1
X: Intrinsic and extrinsic attributes					
Smell	Relevance of the smell: 1 not relevant, 4 very relevant	2.429	0.991	1	4
Taste	Relevance of the taste: 1 not relevant, 6 very relevant	3.228	1.004	1	5
Local	1 if local origin of wine is important, 0 otherwise	0.220	N.A	0	1
Price	Relevance of the price: 1 not relevant, 6 very relevant	4.162	1.654	1	6
White wine	Relevance of the color, white: 1 not relevant, 6 very relevant	4.281	1.759	1	6
Rosé wine	Relevance of the color, rosé: 1 not relevant, 6 very relevant	2.216	1.937	1	6
W: Shopping places					
Large retailers	1 wine is mainly purchased in large retailers, 0 elsewhere	0.514	N.A	0	1
Web	1 wine is mainly purchased using internet, 0 elsewhere	0.010	N.A	0	1
Wine shop	1 wine is mainly purchased in specialized wine shops, 0 elsewhere	0.409	N.A	0	1
Others	1 wine is mainly purchased in other shopping places; 0 elsewhere	0.067	N.A	0	1

d) Consumers' preferences towards different wine shopping places.

Analytically, the following relation is subjected to empirical evidence for each *i*-th individual and for each *j*-th wine category:

$$Q_{(j,i)} = f\left(\mathbf{K}_{(i)} + \mathbf{X}_{(i)} + \mathbf{Z}_{(i)} + \mathbf{W}_{(i)}\right) + \varepsilon_{(j,i)} \qquad \forall \begin{cases} i = 1, ..., I \\ j = 1, ..., J \end{cases} \tag{1}$$

where:

$Q_{(j,i)}$ identifies the quantity of wine of the *j*-th typology consumed by the *i*-th respondent;
$\mathbf{K}_{(i)}$ identifies the vector comprising the socio-demographic characteristics of the *i*-th respondent;
$\mathbf{X}_{(i)}$ identifies the vector of variables accounting for the preferences of the *i*-th respondent towards different wine attributes;
$\mathbf{Z}_{(i)}$ identifies the vector reporting the variables concerning the *i*-th respondent's consumption habits and motivations to consume wine;
$\mathbf{W}_{(i)}$ identifies the vector containing the variables expressing the preferences of the *i*-th respondent for the different wine shopping places;
$\varepsilon_{(j,i)}$ represents the stochastic term.

Usually it is possible to express Eq. (1) as a system of linear additive functions that assume the following explicit formulation:

$$Q_{(j,i)} = \alpha_{(j)} + \mathbf{K}'_{(i)}\delta_{(j)} + \mathbf{X}'_{(i)}\beta_{(j)} + \mathbf{Z}'_{(i)}\gamma_{(j)} + \mathbf{W}'_{(i)}\tau_{(j)} + \varepsilon_{(j,i)} \qquad \forall \begin{cases} i = 1, ..., I \\ j = 1, ..., J \end{cases} \tag{2}$$

where α is the intercept of the *j*-th equation and δ, β, γ e τ are the unknown coefficients to be estimated for each *j*-th equation using the seemingly unrelated regressions (SUR) estimator (Zellner, 1962).

$$\begin{cases} Q_{bulk,i} = \alpha_{bulk} + {}_{bulk}k_i + \beta_{bulk}x_i + \gamma_{bulk}z_i + \tau_{bulk}w_i + \varepsilon_{bulk,i} \\ Q_{basic,i} = \alpha_{basic} + {}_{basic}k_i + \beta_{basic}x_i + \gamma_{basic}z_i + \tau_{basic}w_i + \varepsilon_{basic,i} \\ Q_{PGI,i} = \alpha_{PGI} + {}_{PGI}k_i + \beta_{PGI}x_i + \gamma_{PGI}z_i + \tau_{PGI}w_i + \varepsilon_{PGI,i} \\ Q_{PDO,i} = \alpha_{PDO} + {}_{PDO}k_i + \beta_{PDO}x_i + \gamma_{PDO}z_i + \tau_{PDO}w_i + \varepsilon_{PDO,i} \end{cases} \tag{3}$$

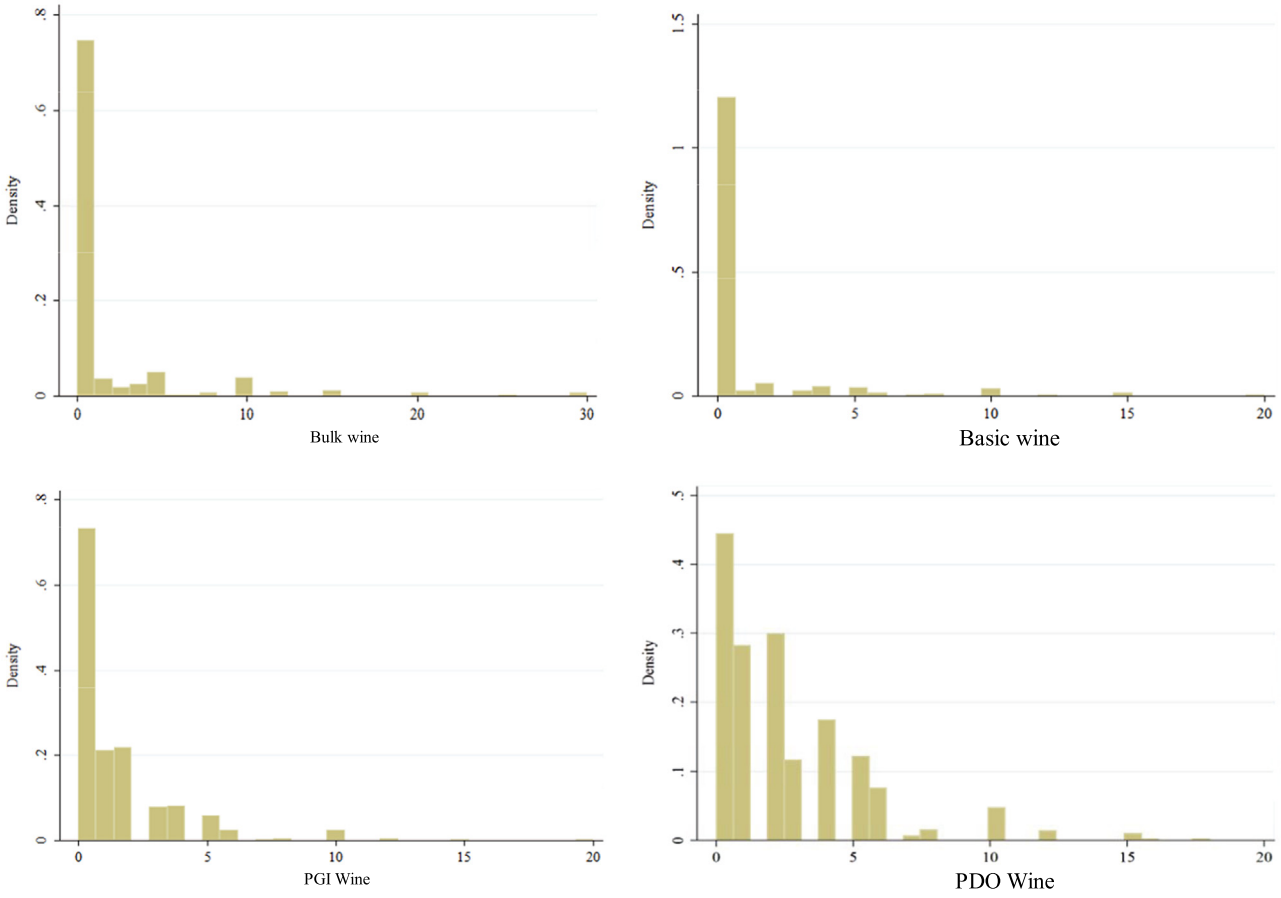

Fig. 2. Frequency distribution of per capita wine consumption (liters per month).

The SUR assumes that several relationships are linked due to the correlation among their residuals that are assumed to be distributed as multivariate normal $\begin{pmatrix} \varepsilon_{bulk,i} \\ \varepsilon_{basic,i} \\ \varepsilon_{PGI,i} \\ \varepsilon_{PDO,i} \end{pmatrix} \sim N(0,\sum)$ with mean zero and a covariance matrix:

$$\sum \equiv \begin{bmatrix} \sigma^2_{bulk} & \sigma_{bulk,basic} & \sigma_{bulk,PGI} & \sigma_{bulk,PDO} \\ \sigma_{basic,bulk} & \sigma^2_{basic} & \sigma_{basic,PGI} & \sigma_{basic,PDO} \\ \sigma_{PGI,bulk} & \sigma_{PGI,basic} & \sigma^2_{PGI} & \sigma_{PGI,PDO} \\ \sigma_{PDO,bulk} & \sigma_{PDO,basic} & \sigma_{PDO,sfuso} & \sigma^2_{PDO} \end{bmatrix} \quad (4)$$

Each estimated coefficient represents the marginal effect of the corresponding explanatory variable on the consumption of the *j*-th typology of wine. From an empirical point of view, the estimation of the system of equations poses some methodological problems when, as in our case, cross-sectional data on consumption are used. This type of data is represented by observations of real consumption in a limited time span (monthly consumption in our case). The limited time span may rise to a high frequency of dependent variable censored at zero, producing sensible distortions in the estimation (Fig. 2).

The estimate of the consumption function, as expressed in Eq. (3), which only uses individuals with positive consumption and applies ordinary least squares, leads to inconsistent values of the parameters since the sample is censored. In this case Heckman (1979) suggests a two-stage estimation procedure. In the first step a model for the consumer participation decision is estimated, while in the second step the consumption decision is estimated that includes all the observations following the procedure for correcting omitted variable bias. In the case of a system of *J* equations, the procedure followed by Heien and Wessells (1990) is used here:

$$Q_{(j,i)} = \alpha_{(j)} + \mathbf{K}'_{(i)}\delta_{(j)} + \mathbf{X}'_{(i)}\beta_{(j)} + \mathbf{Z}'_{(i)}\gamma_{(j)} + \mathbf{W}'_{(i)}\tau_{(j)} + \varepsilon_{(j,i)} + \rho_{(j)}\lambda_{(j,i)} + \varepsilon_{(j,i)} \quad \forall \begin{cases} i = 1, ..., I \\ j = 1, ..., J \end{cases} \quad (5)$$

where $\lambda_{(j,i)}$ represents the inverse Mills ratio computed as $\frac{(\mathbf{B}'\ \mathbf{\Omega})}{(\boldsymbol{B}'\boldsymbol{\Omega})}$ where$(\mathbf{B}'\ \mathbf{\Omega})$ and $(\boldsymbol{B}'\boldsymbol{\Omega})$ are the probability density function (PDF) and the cumulative density function (CDF),respectively, that are obtained from a multivariate probit estimation (first

Table 2
Percentage frequency of consumption of four wine categories.

	Bulk	PGI	Basic	PDO
	Male			
No consumption	71.24	52.75	82.23	29.77
Consumption	28.76	47.25	17.77	70.23
	Female			
No consumption	85.82	42.53	84.29	21.07
Consumption	14.18	57.47	15.71	78.93
	Total sample			
No consumption	75.24	49.95	82.79	27.39
Consumption	24.76	50.05	17.21	72.61

Table 3
Results of econometric analysis of consumed wine (quantity).

	PDO			PGI			Basic wine			Bulk wine		
	Coeff.	*t*-stat	*p*-Value	Coeff.	*t*-stat	*p*-Value	Coeff.	*t*-stat	*p*-Value	Coeff.	*t*-stat	*p*-Value
K: Socio-demographic characteristics												
Age	−0.006	−2.18	0.029	0.001	0.23	0.817	0.002	1.24	0.215	0.006	2.74	0.006
Education	0.259	4.97	<0.001	0.071	1.40	0.162	−0.151	−5	<0.001	−0.063	−1.52	0.129
Income	0.153	3.87	<0.001	0.152	3.97	<0.001	−0.031	−1.35	0.177	−0.030	−0.97	0.332
Gender	−0.057	−0.88	0.381	0.058	0.92	0.355	−0.050	−1.33	0.183	−0.016	−0.31	0.757
Z: Habits and motivation of consumption												
Between meals	−0.268	−5.4	<0.001	−0.197	−4.11	<0.001	0.003	0.11	0.91	−0.048	−1.22	0.221
Restaurant/ wine-bar	0.063	2.65	0.008	0.032	1.4	0.16	−0.031	−2.27	0.023	−0.059	−3.13	0.002
Advertising	−0.067	−3.00	0.003	−0.073	−3.37	0.001	0.067	5.15	<0.001	−0.020	−1.10	0.269
Guide	0.355	4.95	<0.001	0.180	2.59	0.01	−0.009	−0.22	0.829	−0.081	−1.42	0.155
X: Intrinsic and extrinsic attributes												
Smell	−0.055	−1.85	0.065	−0.048	−1.65	0.1	−0.019	−1.08	0.28	−0.011	−0.46	0.649
Taste	−0.042	−1.40	0.16	−0.015	−0.51	0.613	−0.045	−2.6	0.009	−0.043	−1.79	0.074
Local	−0.432	−5.31	<0.001	−0.324	−4.09	<0.001	−0.172	−3.66	<0.001	1.400	21.67	<0.001
Price	−0.044	−2.29	0.022	−0.004	−0.21	0.832	0.044	3.95	<0.001	0.010	0.68	0.5
White	0.038	2.14	0.032	0.070	4.13	<0.001	−0.002	−0.2	0.841	−0.071	−5.09	<0.001
Rose	−0.044	−2.87	0.004	−0.008	−0.54	0.591	0.048	5.32	<0.001	−0.033	−2.72	0.006
W: Shopping places												
Modern distribution	0.358	5.37	<0.001	0.227	3.49	<0.001	0.105	2.72	0.007	−0.400	−7.58	<0.001
Online purchase	0.316	1.15	0.252	0.953	3.56	<0.001	0.302	1.89	0.058	0.237	1.09	0.278
Wineshop	0.104	1.47	0.143	0.105	1.54	0.124	0.024	0.6	0.551	−0.238	−4.26	<0.001
Mills Ratio	−0.593	−8.87	<0.001	−0.422	−4.77	<0.001	0.434	10.22	<0.001	0.275	5.22	<0.001
Constant	0.297	0.95	0.344	−0.210	−0.69	0.492	0.352	1.92	0.055	0.784	3.16	0.002

stage estimation)of the relation:

$$\mathbf{y}^* = B'\mathbf{\Omega}_j + \boldsymbol{\eta}_j \tag{6}$$

with:

$$y_j = \begin{cases} 1 & if \quad y_j^* > 0 \\ 0 & if \quad y_j^* \le 0 \end{cases} \qquad \forall \{j = 1, \ldots, J \tag{7}$$

where η_j represents the stochastic term.

Results and discussion

Consumption of the different types of wine (monthly consumption of basic (i), bulk(ii), PGI (iii), and PDO (iv) wines) is characterized by high frequency of null consumption especially for non-premium wines (bulk and basic ones). By analyzing the result by gender, women list higher frequency of consumption for high-end quality wines (PGI and PDO), while males are more positively inclined towards bulk and basic wines (Table 2).

Table 3 shows the results of the equation system with censored dependent variables. In order to control for a possible source of heteroscedasticity, bootstrapped standard errors were used. Finally, the results of a preliminary Box-Cox estimate suggested the log-linear as the functional form for the model. The analysis was addressed to identify the main determinants of consumption for the different typologies of Italian wine (PDO wines, PGI wines, basic wines, and bulk wines), and it was carried out by dividing the observations into four sub-sections: socio-demographic characteristics, motivation and patterns of consumption, intrinsic and extrinsic attributes, and shopping places.

Socio-demographic variables

By observing the main results on the socio-demographic variables that influence the consumption of Italian wines, it emerges that age, education, and income affect the consumption of each kind of wine differently.

The variable age positively influences the consumption of lower quality wines, such as bulk wine; the results highlight that the elderly consume common wines more frequently. This appears to be consistent with the findings of Lanfranchi et al. (2014) and Di Vita et al. (2014b); the latter, in particular, highlighted how consumers included in the 36–50 years age class frequently drink basic wines. At the same time age appears to negatively affect the consumption of PDO wines, and even in this case this trend occurs with higher relevance among the elderly consumers, probably because these consumers are the least informed category among wine drinkers and as such they are not influenced by the origin and designation of a wine.

The results show that a higher education level positively influences the amount of PDO wine consumed, whereas it negatively influences the consumption of basic wines (Fig. 3). As previously reported in a study concerning Italian wine

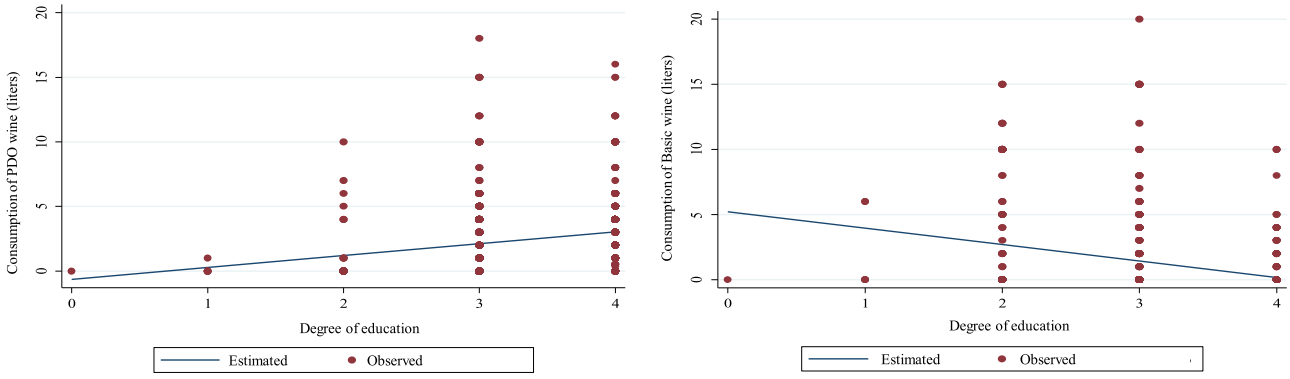

Fig. 3. Relationship between education of interviewees and wine typology consumption (PDO and basic wine).

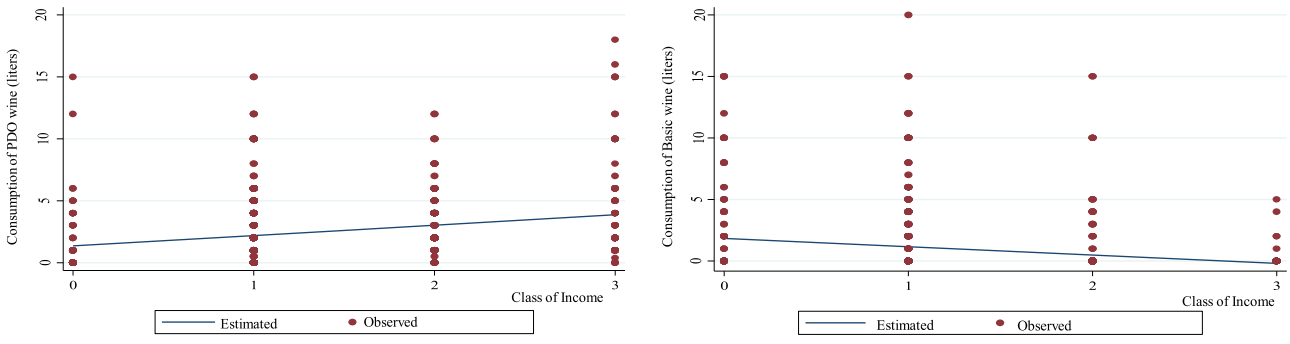

Fig. 4. Relationship between income of interviewees and wine typology consumption (PDO and basic wine).

consumers' attitudes (Di Vita et al., 2014b), this outcome confirms that consumers with a high educational profile orient their preferences towards PDO wines.

With regard to the influence of income on wine consumption, we observed a positive correlation between a high annual income and high-quality wine consumption (Fig. 4). In fact, as the income increases, the consumption of both PDO and PGI wine increases. This tendency is found almost equally for both types of certified wines and shows the high level of consumer awareness amongst the upper-middle class.[2]

Habits and motivation of consumption

The results indicate that those who consume wine between meals are characterized by a low use of high-end wines, and those who consume wines outside the home, such as in restaurants and wine bars, show a higher propensity towards PDO and PGI wines rather than basic or bulk wines.

To ascertain the main motivations that persuade consumers to choose a specific typology of wine category, our analysis focused on the role of advertising and wine guides. The suggestions and advice of wine guides positively influence the choices of PDO and PGI wines, thereby confirming that the provision of more detailed information increases the propensity of consumers to choose high-quality wines (Di Vita et al., 2014b). Conversely, wine advertising has a greater influence on the demand for low-quality wines, such as basic wines, and it does not have a direct effect on the purchase of high-end wines. This result seems to suggest that low-end wine consumers are less informed, and is in line with a previous study by Bruwer et al. (2002) in which basic wine drinkers were shown to have a low level of involvement in wine and consequent low knowledge levels.

The role of intrinsic and extrinsic attributes

According to the classification of product attributes (Nelson, 1970; Caswell and Mojduszka, 1996), the effect of intrinsic and extrinsic attributes on consumer behavior have been widely observed and investigated for many PDO products such as olive oil, wine, and many others (Menapace et al., 2011; Panzone et al., 2016; Espejel et al., 2011; Vecchio and Annunziata, 2011), but we found that there is a paucity of such observations for basic and bulk wines.

In line with the previously observed findings for other wine typologies (D'Amico et al., 2014a, 2014b), the present study seems to confirm that consumers consider locally produced wine as a very important product and, at the same time, the negative values of the coefficient highlight that consumers who buy wine directly from local producers are not interested in the product designation, such as whether they are PDO or PGI wines, and they are not interested in basic wines.

[2]It is to be acknowledged that income, age and gender are consumers characteristics often correlated (i.e younger people may benefit a lower income). However, any type of correlation among the covariates is properly addressed by the model.

However, for local wines bulk wines represent the most consumed wine typology. This can be adequately explained by the fact that the consumer who buys proximal products believes that the purchase from the producer appears to be disconnected from the logic of official certifications related to quality. Moreover, the consumer probably believes that a purchase made directly from the producer does not necessarily have to be supported by a specific packaging or placed in a glass bottle, which, among other things, would cause an increase in costs both for producers and consumers. Accordingly, the purchase of local wine implies a lower demand for certified quality as the reputation of the producer is more important than the geographical indication, such as PDO and PGI. Such a result is consistent with a previous study, which observed that Italian purchasers of locally produced wines are uninterested in PDO and PGI wines (D'Amico et al., 2014a, 2014b).

The price represents another important determinant in the wine typology choice. The role of its mechanism, which has been widely studied in the marketing and economic literature, is well established (Lockshin et al., 2006; Mueller et al., 2012; Lockshin and Corsi, 2012). Our results on the price are strongly consistent with a large strand of previous literature showing that the price of the geographical indication products varies fairly significantly among different wine typologies (Costanigro et al., 2010). For those consumers who consider the price to be an important attribute, there is a lower consumption of PDO wines and a higher consumption of basic wines. Consequently, and not surprisingly, price plays a prominent role for basic wines, and this is probably because the price is more important for a consumer with a low involvement and a scarce knowledge of the attributes of a quality wine (Lockshin et al., 2006).

In accordance with the existing wine economics literature on sensory attributes, this study focused on the intrinsic attributes of wine. It was observed that the respondents were mainly attracted by taste and color. Many authors have demonstrated the importance of taste on consumers' preferences and choices (Rasmussen and Lockshin, 1999; Casini et al., 2009; Mueller et al., 2010), so this study has also focused on the primary role of taste in choosing a wine. Consumers considers taste to be a very significant attribute, although its importance varies greatly in relation to the wine typology (Williamson et al., 2017).

In fact, the respondents who consider the taste to be an important characteristic show a lower consumption of the basic wines. As expected this result highlights a direct correlation between the increasing quality of wines and the taste attribute.

Even the empirical evidence deriving from the analysis of different color attributes for each wine typology is quite interesting, because color appears to be important for white and rosé wines.

A white color is considered especially valuable by PDO and PGI wine consumers, whereas the consumers of bulk wines exhibit a significantly low level of appreciation for a white color in their wines. This shows that Italian consumers who have a preference for white wines are mainly oriented towards a higher consumption of quality wines. Conversely, for red

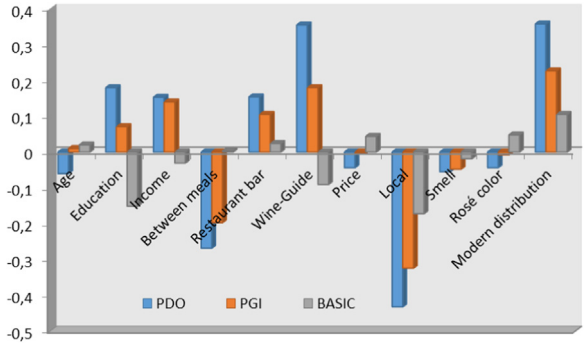

Fig. 5. The quality scales of wine.

wines the consumption pattern appears to be quite universal without showing any significant differences between all the wine categories considered. In Italy red wine has a similar dynamic all along the different segments of consumption regardless of its typology.

The outcome for rosé wines is quite interesting because, as was argued in a previous study, it has a specific reputation in the consumers' minds. Nevertheless, this is true only if these wines are well known and locally produced, since their consumption has singular characteristics that depend on each specific local market (Corsinovi et al., 2013; Velikova et al., 2015). In the mind of consumers, rosé wines are placed in an intermediate quality level, since they are often differently perceived by consumers and have an ambivalent image (Velikova et al., 2015). Moreover, in contrast to what was observed in previous studies that assessed the low interest of the Italian consumer towards rosé wines (D'Amico et al., 2014; Caracciolo et al., 2015), the consumption of such wines assumes a certain relevance for the basic wine category, whereas the level of interest is strongly reduced for both the highest and lowest quality wines; there is a negative correlation to PDO and bulk wine.

Shopping places

The role of the shopping place is one of the most important variables for a consumer's purchase of wine (Sánchez and Gil, 1998; Platania et al., 2016). Our study distinguished four different shopping places for each category of wines analyzed. As expected, modern distribution methods, such as hypermarkets and supermarkets, play a prominent role in the purchase of PDO and PGI wines. Modern distribution is also a favorite channel for basic wines, but it is negatively correlated to bulk wine purchases.

Online purchases are of the utmost importance for PGI wines, whereas no positive correlation was observed for all of the other wine typologies. This result allows us to identify a significant difference between the PDO and PGI designation forms, even if its explanation is not evident. It could be reasonably explained by the wider availability of these wines on the market, given that online wine consumers buy in relatively larger quantities (Bruwer and Wood, 2005).

The purchase of wine at wine shops was not so common among the interviewed sample; nevertheless, it appears to be negatively related to the consumption of bulk wine. As expected purchases from wineries are very relevant in terms of quantities for basic and bulk wines, whereas they are negatively correlated with PDO and PGI wine consumption.

What has been analyzed up to now allows us to push the discussion a little further on by questioning whether there is any relationship between consumers' motivation and the qualitative scales of wine. In particular, we question whether the hierarchical scales of wines are in a certain way correlated with the regression coefficients of consumers' predictor variables and whether this correlation is proportional or less.

Table 3 reports the regression coefficients attached to the four-level wine categories and shows a direct correlation for the majority of explanatory variables we employed.

In this sense the graphic reported in Fig. 5 seems to confirm the hypothesis of a quality pyramid, since there is a high consistency between the hierarchical scale of quality wines and the coefficients of most of the variables. In particular, there is some evidence that an increasing or decreasing relationship in absolute value between the quality of the wine and the values of the regressors is largely confirmed for PDO, PGI, and basic wines. Only the bulk wines escape this trend; the dynamics observed for these wines are not consistent with the initial hypothesis since the correlation between the value of the coefficients of the variables and the qualitative level of the wine does not always occur.

This correlation was verified for the socio-demographic characteristics such as age, education, and income, with the only exception being in respect of gender. The correlation was also verified for the habits of consumption (i.e., for "between meals," "restaurant-bar," and "wine-guide" but with the exception of advertising) and also for the intrinsic and extrinsic characteristics (i.e., "smell," "local," "price," and "rosé color", but excluding "taste" and "white colour"). Conversely, with regard to shopping places, this correlation was observed only for modern distribution; there was no direct correlation for online purchase and wine shops.

As a result, the coefficients of PGI for most of the variables are always placed on an intermediate level with respect to the PDOs and basic wines, which aligns with the hierarchical order of the three quality levels of wine considered.

The final outcomes seem to largely confirm the initial hypothesis predicting a link between the wine quality and the characteristics of the explanatory variables and they lead to an additional contribution to the existing literature. The results partially support the insight that consumers perceive and act in different ways when they choose wines with different quality levels; this suggests that there is an increasing or decreasing difference in the role of reputation, identity, and image for basic, PGI, and PDO wines.

Conclusions

This study provides insights on the different quality perceptions of wines by Italian consumers and verifies whether

consumers perceive significant differences among the different categories of wines. The overall results, which were obtained through a system of equation estimates, show that consumer motivations and wine consumption determinants change according to each different range of wine quality and thereby support a quality pyramid of wines, supporting the research hypothesis behind this study. The study also provides interesting additional information for the wine economics literature in respect of premium, basic, and bulk wines.

This study confirms the traditional dichotomy between basic and premium wines, such as PGI and PDO wines, which were observed in prior studies (Di Vita et al., 2014b). Furthermore, by comparing the different consumer motivations towards the two most common food designations in the European Union, this study highlights for first time any differences in the consumption determinants between the PDO and the PGI wines in a national context, although they show different patterns and attitudes among the consumers. This suggests that the influence of the two different GI labels on the wine choice of consumers is truly different.

The substantial difference found between PDO and PGI wines concerns the way they are bought, as our analysis detected a higher online buying propensity for PGI wines only. In addition, age and education were crucial only for PDO wines; they do not seem to significantly influence the consumption of PGI wines.

A positive correlation was also found between high annual income and high-quality wine consumption for both PDO and PGI wines. Interesting differences were also observed among the specific attributes of each category of wine, such as taste and color. In particular, consumer appreciation of taste increases as the level of wine increases from lower to higher quality, while color shows more complex dynamics. White wines are the most appreciated among the consumers of certified wines, while rosé is a significant attribute only for basic wines. Conversely, red wines show fairly common dynamics in all segments of consumption; they are consumed regardless of their typology. In addition, this study observed that price does not affect the choices of high-end wines; thus, it does not represent a direct quality signal for consumers,

This study was directed towards detecting consumers' motivation by measuring the incidence of the econometric coefficient in the explanatory variables for different quality scale wines; a direct correlation was found between the coefficient of the regressor and quality scales of the wine. We observed that the consumers' motivation progressively changes as the quality scales of the wine increase or decrease. This last outcome supports the pyramid of quality concept, which highlights the link between wine quality and the econometric values of the explanatory variables. This result represents an additional contribution of this study to the existing literature; in addition, our empirical approach provides novel insights for the analysis of wine consumption at individual level.

The results will enable winemakers to better address their price policies for origin-labelled wines and have important implications for policy makers who wish to evaluate whether current tools are able to effectively regulate the wine market information mechanism. In addition, it is interesting that the importance of bulk wines is increasing and this seems to be closely related to wine tourism and the desire to buy locally produced wines.

Furthermore, our results may influence marketing strategies of the two main typologies of producers existing in the Italian market: cooperatives and investor-owned firm. Cooperatives, mainly oriented towards bulk wines production, could benefit by promoting these wines as locally produced food, thus exploiting niche market opportunities in specific territorial contexts. On the other side, the investor-owned firms may get useful insights for PDO and PGI wines, by segmenting their sales channel structure. PDO certified wines should be distributed through specialized distribution channel, such as wine-shops, wine-bars and restaurants, while PGI wine should be more easily traded by means of large-scale retail and the e-commerce.

A limitation of this study could be our use of the wine quantities consumed, instead of the price, as a dependent variable to convey information on the consumption of the different wine typologies. Indeed, this approach allowed us to point out that price does not always seem to be decisive in the choice of each wine typology.

By taking into account the average quantities of wine consumed, further research could be conducted to analyze the total amount of consumer wine purchases as well as the role of other parameters not yet investigated, such as the alcohol content and the consumption of alternative beverages to wine, such as beer. Future research should also develop a more accurate economic model to test the consumers' behavior towards ultra-premium wines.

Conflict of interest

None.

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