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Social or environmental consciousness? Exploring the consumption of cooperative wines among European citizens

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Abstract. Although the role of wine cooperatives in supporting sustainability has been deeply analysed on the supply side, the study of consumers' perception and behaviour when choosing these wines is still scarce. This paper analyses the attitudes, preferences and the willingness to pay (WTP) of European consumers, both when they purchase cooperative-produced wines and in their attitude to consuming these wines. Their preferences between cooperative-produced and organic wines were compared with the aim of understanding whether they prioritise the social aspects of the cooperatives or the environmentally friendly aspects of organic production. A survey among 3,295 individuals in different European countries was carried out. The data were firstly analysed by means of univariate tests to assess consumers' heterogeneity and by a bivariate probit model to explore the drivers of attitude and behaviour; then a multinomial logit and a random parameters logit framework were adopted. We found an association between familiarity with cooperative and organic wines and thus the propensity to buy these products and a higher WTP for organic than cooperative wines. Our findings suggest that producing organic wines might be a strategy for wine cooperatives to better target the market.

Keywords: cooperative wine, sustainability, wine consumption.

1. INTRODUCTION

Agricultural cooperatives play a significant role in influencing farms' sustainability [1]. According to Dessart et al. [2], several studies have assessed the importance of cooperatives in supporting farms' sustainability efforts. Some studies have identified the positive impacts of agricultural cooperatives. Since 1962, the economic behaviour of cooperatives has been analysed by scholars through the use of a number of different models [3]. They studied, in particular, the economic organisation of agricultural cooperatives (e.g. [4]), their governance structure (e.g. [5]), the members' economic gains (e.g. [6]) and the quality choices of cooperatives (e.g. [7]). These studies, however, also recognised some economic weaknesses, such as often poor eco-

nomic performance [8], overproduction linked to open membership [7] and underinvestment [9]. However, they pointed out the economic advantages linked to eliminating supply chain intermediaries [10]. Moreover, some scholars demonstrated that cooperatives are able to produce positive net economic results [11,12].

Furthermore, cooperatives encourage the adoption of environmentally friendly practices among members [13] and offer technical assistance to increase farmers' propensity to adopt safe production practices [14].

In addition, although studies explicitly exploring the social role of cooperatives are scarce and mainly carried out by sociologists [15,16], they demonstrated that being a member of a cooperative has a positive impact [17,18]. Besides the well-known enhancement of bargaining power effect, the opportunity to derive advantages from scale economies and to increase the value of members' raw products, specifically referring to social aspects, it is possible to point out also the opportunity to increase social interactions between members and non-members.

The presence of cooperatives covers a significant part of the wine production sector [19]: for example, according to ISMEA [20], more than 55% of Italian wine production comes from cooperatives, which, therefore, could play a role in the improvement of wine farm sustainability [21,22]. The close relationships that cooperatives create with grape producers may support the change of farm practices, including supporting the adoption of more sustainable methods of grape growing, may enhance positive external social impacts [23] and may increase economic performance [11,24].

However, the relevant role that cooperatives can play in supporting sustainability does not seem to be completely recognised by consumers who seem to be solely aware of cooperatives' social contributions. Furthermore, consumers do not seem to prefer wines produced by cooperatives, which they consider to be unsatisfactory in terms of quality. Although consumers have become increasingly aware of and sensitive to sustainability issues, it seems that cooperatives are assigned the pure role of social sustainability.

Consequently, the first purpose of our study was to explore consumers' attitudes and preferences towards wines produced by cooperatives in different geographical contexts. It aimed to analyse the attitudes, preferences and the willingness to pay (WTP) of European consumers, both when they purchase cooperative-produced wines and in their attitude to consuming these wines.

The second purpose was to compare consumers' preferences for cooperative-produced and organic wines to determine whether they prefer the cooperatives' social role or the environmentally friendly aspects mainly represented by organic wines. We analysed these aspects on a convenience sample of European consumers, both those familiar and clearly not familiar with cooperative-produced wines in order to identify differences in their replies. Our research combines wine consumers' social, economic and environmental points of view; consequently, it is fundamentally different from traditional studies devoted to the evaluation of wine consumption. Moreover, in line with Brucks [25], our study focuses on subjective knowledge and investigates factors that affect subjective (potential consumers') knowledge, which is a different approach in comparison with studies analysing knowledge as a generic concept.

In our study, the analysis was carried out, first, by means both of univariate tests to assess consumers' heterogeneity and by a bivariate probit model. Then a multinomial logit (MNL) and a random parameters logit (RPL) framework were adopted to study the choice experiment (CE). This latter part of the study allowed us to further analyse and point out possible preference heterogeneities across respondents, and then to elicit the WTP.

The remainder of the paper proceeds as follows. A literature review and theoretical framework descriptions are offered in Section 2. Section 3 presents the methodological approach together with the data specification, while Section 4 describes and discusses the main results. Finally, Section 5 is devoted to presenting the implications together with several concluding remarks.

2. LITERATURE REVIEW

The wine choices of consumers present a level of complexity unparalleled with any other food product [26]. Because the type of wine supplied in supermarkets and other shops is extremely varied according to different characteristics and due to the lack of both wine education and experience, a vast majority of wine consumers base their choices on the information they can find on the bottles [27,28]. Several studies have analysed consumers' preferences concerning the traditional features usually reported on bottles, but the reasons that motivate consumers to buy and consume wines produced by cooperatives have not attracted the attention of many scholars.

While the supply side of cooperative wines has been deeply analysed among scholars, empirical studies exploring consumers' behaviour, habit and preferences towards these kinds of wines are still scarce [29]. Moreover, the great part of these studies pointed out consumers' negative judgements about the quality of cooperative wine. The poor reputation of wine cooperatives was largely identified by Elster [30] and Garrido [31]. Scha-

mel [32] pointed out that the assumption of lower quality is reflected by the lower price point. Garrido [31] stated that the low quality that is conventionally associated with wine produced by cooperatives could be a direct consequence of their inability to avoid the opportunistic behaviours of their members. However, Botonaki and Tsakiridou [33] analysed consumers' intentions to purchase a higher priced cooperative wine with a quality certification and indication label, and they identified positive feedback from respondents and consequently the opportunity to develop wine cooperative production.

Since a growing number of scholars are still highlighting the strengths and advantages of this organisational model among wine production [11,34,35], it seems useful to analyse the factors that affect consumers' preferences for wine made by cooperatives. The literature on this topic is fairly scarce. On the one hand, some studies confirm that negative prejudice towards wine cooperatives still exists, among European consumers in particular [36,37,32]. Wine cooperatives are often cited as unable to pursue branding and differentiation strategies [38,39] and meet consumers' growing demand for high quality and variety [40]: this may explain why a not negligible share of consumers negatively judge the cooperative wine label at all price points [41]. On the other hand, some studies reveal that European consumers are apparently shifting towards more positive opinions on cooperatives and the wines they produce, as confirmed by quantitative studies performed in Austria [42], Germany [43] and Italy [44]. Furthermore, according to recent literature, the adoption of optimal communication and branding strategies seems to be beneficial for the image of wine cooperatives [45-47].

The literature provides several examples of CE to study preferences for various attributes and quality of wine, but, to the best of our knowledge, only one study has used this methodology to investigate interest in wine from cooperatives [37]. Furthermore, no studies have examined respondents' preferences towards cooperative wines in comparison to organic wines with the aim of understanding if consumers are more attracted by the social aspects represented by the cooperation production model or the environmentally friendly methods of production alone.

3. DATA AND METHODS

The aim of this study is twofold: it is focused on the factors affecting knowledge about and consumption of organic and/or cooperative-produced wine, on the one hand, and on consumers' propensity to buy wines produced by cooperatives, investigated by the mean of the CE, on the other hand. Due to the twofold aim of the study, the methodological approach adopted is described in two sub-sections: 3.2 and 3.3.

3.1 The survey

Similarly to the survey carried out by Lockshin et al. [28], this study was based on a data set that collected information on a non-probability sample of 3,295 individuals residing in different European countries: Germany (417), England (412), France (418), Spain (424), Slovenia (814) and Italy (810). These countries were chosen in order to consider a wide range of wine consumers living in different but contextually and culturally similar countries. Data were collected from January to February 2020 through an anonymised online survey conducted by a professional survey and market research company using registered panels in the selected countries [48,49].

Before submission, the questionnaire was translated into different languages and a pilot survey was conducted on 50 consumers from different European countries. This pre-test resulted in a few minor changes in the formulation of questions. Moreover, the alternatives in the choice sets were shown in colour pictures to the respondents, according to the good practice in conducting CE recommended by Lockshin et al. [28] and Loureiro and Umberger [50].

The survey was made up of two main parts that allow for the analysis of respondents' preferences, habits, subjective knowledge and attitudes. In the first part of the survey, each respondent was asked for demographic information, such as gender, year of birth, municipality of residence, education level (a categorical variable for the education degree reached), occupational status (a factor variable for several types of occupational condition) and participation in specific jobs connected with the wine sector (such as producer, enotechnician, restaurateur, trader, sommelier and bartender). This first part of the survey was also devoted to investigating the individual's wine consumption habits (favourite alcoholic drinks, frequency of wine consumption and places of wine purchase) and their subjective knowledge about and consumption of both organic and cooperative-produced wines. Moreover, the respondents were asked to provide a rank, in terms of perceived quality, to different wines. The second part of the survey included questions related to a CE aimed to deepen respondents' attitudes. In the CE experiment, five attributes and their levels were used to describe a white wine, which was described as one produced from the Sauvignon Vert grape in terms of geographical area of origin. It was also specified as

Table 1. Attributes and their levels adopted in the CE design.

Attributes	Levels
Origin (3 levels)	Friuli Venezia Giulia/Other Italian regions/Other European countries
Winescape (2 levels)	Yes/No (i.e. presence of landscape beauties/absence of landscape beauties)
Cooperative produced (2 levels)	Yes/No
Wine quality certification (3 levels)	"table wine"/PDO/organic
Price (€/750 ml bottle) (3 levels)	4.00/8.00/12.00

"winescape" or not, from a cooperative production or not, with a quality certification or not and the price was provided (see Table 1). These attributes were selected during a preliminary focus group discussion with wine producers, consumers, researchers and institutional decision makers and were chosen from a set of characteristics identified as relevant by a group of experts of wines produced by cooperatives. The whole CE design was based on 19,770 choice observations (6 choices completed by each of the 3,295 interviewees). A detailed description of the attributes' levels and the CE characteristics is reported in Section 3.3.

3.2 Habits and subjective knowledge: the econometric analysis

Our analysis was devoted first to study consumer habits and their subjective knowledge about organic and/or cooperative-produced wines. This first part of the study focused on a detailed description of the sample, both the whole sample and the sub-samples at the country level, and a statistical evaluation of the heterogeneity, across countries, of respondents' consumption preferences, habits, and knowledge of organic and cooperative-produced wines. Descriptive statistics allow for the comparison of the respondents' characteristics selected from different countries and to evaluate their heterogeneity in terms of declared habits, preferences and knowledge. In particular, the chi-squared test was used to evaluate the association between country of origin and to separately evaluate the consumption habits and preferences, the purchase place, and the individual ranking of perceived quality attributed to different types of wines. The same approach has been adopted to evaluate the distribution of subjective knowledge of organic and cooperative-produced wines across countries. The individuals' knowledge about these types of wines has been evaluated preliminarily in relation to different individual factors, such as gender, age, education level, occupational status and specific jobs linked to the wine sector. This exploratory analysis used a univariate test (chi-squared test) to assess the association between the subjective knowledge of organic and cooperative-produced wines and individual consumption and purchase behaviour.

The aim was to determine if respondents' familiarity with these specific types of wine is related to individual characteristics. Several aspects related to the individual attitudes towards wine and other alcoholic beverages have been subsequently verified in a multivariate statistical framework.

The choice of generalised linear models with probit link function was straightforward given the binary results for individuals' declared knowledge. However, to evaluate in a multivariate framework the knowledge of both organic and cooperative-produced wines, a seemingly unrelated probit model [51] was considered. This model has been estimated using the biprobit Stata command, which fits a maximum likelihood two-equation model for two binary outcomes. This bivariate probit model represents an appropriate approach to investigate two correlated outcomes: the likelihood of knowing the organic and the cooperative-produced wines. In general, in a discrete choice context, the analysis of correlated decisions is commonly addressed by extending the probit model to the estimation of more than one equation, leading to bivariate (i.e., two equations) or multivariate (i.e. three or more equations) probit equations [52]. However, we adopted this modelling approach since it is suitable for seemingly unrelated outcomes. The two equations estimated were based on the same linear predictors to compare the effects of individual and contextual factors on the two outcomes. The estimated equations may be expressed as follows:

$$y^*_{i1} = \boldsymbol{\beta}^{\mathbf{T}}{}_1 \boldsymbol{x}_i + \varepsilon_{i1} \text{ and } y_{i1} = 1 \text{ if } y^*_{i1} > 0, 0 \text{ otherwise}$$

$$y^*_{i2} = \boldsymbol{\beta}^{\mathbf{T}}{}_2 \boldsymbol{x}_i + \varepsilon_{i2} \text{ and } y_{i2} = 1 \text{ if } y^*_{i2} > 0, 0 \text{ otherwise}$$

$$[\varepsilon_{i1}, \varepsilon_{i2}] \sim N_2(0,0,1,1,\rho)$$

where y_{i1} and y_{i2} are the binary variables representing an individual's knowledge of organic and cooperative-produced wines, respectively; $\boldsymbol{x}_i$ is the vector of the

common set of covariates; $\boldsymbol{\beta}^{\mathbf{T}}{}_1$ and $\boldsymbol{\beta}^{\mathbf{T}}{}_2$ are the two vectors of unknown parameters, and ε_{i1} and ε_{i2} are the random terms assumed to be jointly normally distributed with zero means, unit variances, and correlation term ρ. Therefore, the identification of a correlation coefficient ρ that is significantly different from zero indicates the existence of a correlation between the random components of the two equations, or the unexplained heterogeneity of the knowledge of the two wine types. All the individual and contextual aspects declared in the first part of the survey (country of residence, education level, occupational condition, type of job connected with the wine sector, consumption habits and purchase preferences and frequency) have been included in the linear predictors to address the likelihood of the individual subjective knowledge of organic and/or cooperative-produced wine. Applications of bivariate probit models can be found in several fields of research, including a few studies in the tourism sector [53,54].

3.3. Attitudes: The statistical analysis of the CE experiment

The second part of the analysis investigated the respondents' attitudes toward and their WTP for cooperative-produced wines and used a CE to deepen the level of knowledge and the preferences regarding cooperative-produced wines in terms of the perceived utility as a result of the attributes of cooperative-produced wines. The consumer theory of Lancaster [55], the information processing and decision making in psychology [56], and the random utility model of McFadden [57] represent the statistical economic frameworks for the CE used to estimate behavioural models of consumer choice. Within this context an individual is supposed to choose from a set of alternatives and select the one that allows them to reach the highest utility level. In a CE, the alternatives are decomposed into their key attributes, and a range of levels is associated with each one, which may be combined experimentally into different choice sets. Moreover, the overall utility of an alternative can be decomposed into separate utilities for its attributes, and it becomes a function of alternative characteristics. Finally, the utility function of each respondent is the sum of a deterministic term (a function of the factors that affect the respondent's utility) and a stochastic random term (unobservable to the researcher). In discrete choice modelling, the respondents' utility and the attributes of competing alternatives are not directly observable as alternatives are exhaustive, mutually exclusive and in finite number. The respondents are supposed to maximise their expected utility. While in the conditional logit model, consumers' preferences are assumed to be homogeneous, in the random parameter model (RPL), the assumption of homogeneity of preferences is relaxed.

Five attributes were selected to describe a white wine described to respondents as one produced from the Sauvignon Vert grape (listed in Table 1). The "geographical area of origin" was represented in three ways: *Friuli Venezia Giulia*, a region in the north-eastern Italy, bordering Austria and Slovenia, *other Italian regions* and *other European countries*. According to Gil and Sánchez [58], there was a shift from the designation of an area of excellence in viticulture (e.g. Friuli Venezia Giulia Region) to an increasingly indistinct, generic and broad area (e.g. Other Italian regions, Other European countries). The "winescape" attribute refers to a cultural/viticultural landscape with a combination of well-maintained vineyards, wineries and supporting activities necessary for production [59,60] nestled in a pleasant landscape indicative of an environmentally friendly production method. The presence of the "winescape" attribute is regarded as able to guide consumers' preferences [61] and to develop meaningful social experiences for the wine tourist [62]. It was noticed that associating wine to evocative landscape induces higher preference for tasted wine [63], because of a number of subjective subconscious factors [64], which are not easily quantifiable in market shares. The landscape characteristics were identified through two photographs, one with a generic vineyards context, which in the eyes of the interviewees was intended to evoke poorly sustainable management methods, and the other depicting a beautiful landscape as mentioned above.

As regards the "quality certification", three types were considered in the survey: *table wine*, *protected designation of origin (PDO)*, and *organic*. The level *table wine* refers to the most basic wine [65], while *PDO* refers to wines that are made in defined geographical areas and are considered of higher quality. PDO is a geographical indication aimed at differentiating the origin of the wine and giving a signal of quality to the consumer [66]. Finally, we decided to include the *organic* level in this attribute to analyse the attitude towards this type of wine among consumers of different European countries, given the literature debate in this regard. According to [67], on average, the organic production method seems not to affect the likelihood of consumers' choices. However, empirical evidence has demonstrated consumers' heterogeneous taste for this attribute and the existence of significant market segments with higher preference for organic wine. The combination of these different levels for the quality certifications attribute is not a novelty among previous studies [68].

The attribute "price" presented three levels, ranging from €4.00-12.00 per bottle (750 ml), chosen considering

the Institute of Services for the Agricultural and Food Market (ISMEA) periodical analysis of prices for white wines (€ per hectolitre) [20].

Given these attributes and their levels, a fractional factorial orthogonal design produced 18 alternatives (options), which were randomly combined into 6 choice sets involving the comparison among different bottles of wine with varying levels of attributes. The presence of dominant alternatives was taken into account by researchers' review and tested for during the pre-test of the questionnaire [69]. However, no choice tasks with dominant alternatives were identified. During pre-test also the presence of perceived correlation among attributes, which could cause scenario rejection, were analysed [70].

To simulate a realistic purchase scenario, attributes were presented graphically as wine labels on a wine bottle. In the choice task, each respondent was required to select an alternative among three different bottles, defined according to the attributes, or the "opt-out" alternative, which was included to provide the possibility of no selection. Each respondent was asked to consider each choice task as a separate situation and was also informed that the chosen wine bottle had no difference in any other aspects, except for the declared attributes. The occasion for the purchase was mentioned: respondents were asked to buy a bottle of white wine produced with Sauvignon Vert for a meal at home. Since different purchase occasions evoke different levels of involvement in a purchase situation, we decided to specify the purchase occasion to avoid biased responses.

Choice sets were shown to the respondents as colour pictures. Table 2 shows the text associated with a choice set presented to respondents in our survey.

Consumers' attitude towards cooperative wine has been analysed by means of an MNL model extended to a RPL, estimated using the NLogit 6® version of Limdep

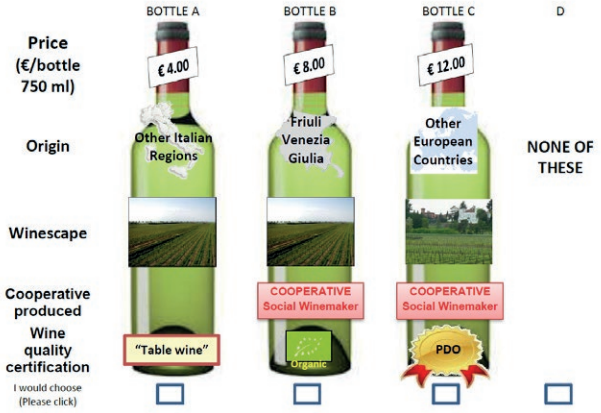

Table 2. Example of a choice set (English version).

software. This model was based on the following linear utility function:

$$U_i = \beta_0 + \beta_1 FVG_i + \beta_2 Italy_i + \beta_3 Winescape_i + \beta_4 Cooperative_i + \beta_5 PDO_i + \beta_6 Organic_i + \beta_7 Price_i$$

where the constant β_0 refers to the opt-out choice, "FVG" and "Italy" are the dummies for production in the *Friuli Venezia Giulia* region or in *other Italian regions*; "Winescape" is the dummy for the *winescape* attribute; "Cooperative" is the dummy for the cooperative-produced wine. "PDO" is relative to the *PDO* quality, and "Organic" refers to the *organic* wine. Finally, "Price" is the variable related to the price levels, which are assumed to be continuous. The β_s coefficients can be considered as the marginal contributions of each attribute on the consumer utility function. Only the significant interactions have been taken into account in the final model. The random term was assumed normally distributed. The analysis also allowed for the estimation of the premium price (or WTP) for each attribute level by dividing β coefficients by β_{price} (WTP = - β/β_{price}).

4. RESULTS AND DISCUSSION

This section presents the results obtained in all steps of the analysis, starting with a detailed description of respondents' characteristics and habits, reported in subsection 4.1. The descriptive analysis explores the individual factors and then correlates them with their familiarity with organic and cooperative wine, which is further assessed both through univariate analysis and through the adoption of a seemingly unrelated probit model, whose results are reported in Section 4.2. Section 4.3 focuses on individuals' propensity towards the cooperative-produced wines, analysed by means of a RPL model applied to the CE data.

4.1 Interviewee characteristics and wine consumption preferences

The first part of our analysis describes the sampled interviewee in terms of their social, economic and demographic aspects, considering their distribution across countries also. In this phase, the results of univariate analysis are reported to evaluate the association between the knowledge of biological and cooperative wine and individual aspects.

The 3,295 interviewees were distributed across the following European countries: Italy, Slovenia, Spain, France, England and Germany. Italy and Slovenia were

Table 3. Descriptive statistics on some socio-demographic characteristics as percentages of the whole sample.

	DE	*EN*	*FR*	*IT*	*SLO*	*ES*	*TOT*
Males *(%)*	49.40	43.69	46.65	47.79	55.04	50.94	49.29
Age classes (%)							
16–24	12.71	8.25	14.12	10.86	26.04	8.02	14.57
25–44	34.05	46.36	36.60	44.08	47.54	46.94	43.37
45–64	37.89	36.17	36.12	30.62	23.84	38.44	32.26
65+	15.35	9.22	13.16	14.44	2.58	6.60	9.80
Education level (%)							
Primary school	7.43	3.16	1.68	0.74	7.86	4.48	4.25
Secondary school	40.05	2.91	5.98	7.41	46.07	7.78	20.39
Some high school	15.59	21.84	39.24	5.68	5.04	10.14	13.63
High school degree	19.66	29.61	30.38	51.48	14.99	29.72	30.23
University degree	11.99	36.17	20.81	33.21	21.25	36.32	26.77
Other	5.28	6.31	1.91	1.48	4.79	11.56	4.73
Occupation (%)							
Entrepreneur	7.91	10.68	4.78	7.28	8.85	12.03	8.47
Employee	47.72	60.68	51.20	40.12	50.74	52.36	49.26
Self-employed	4.08	1.46	1.20	5.31	3.19	5.66	3.66
Retiree	19.42	10.19	16.26	13.09	5.40	5.42	11.05
Student or housewife	15.11	10.19	19.14	27.16	22.85	13.68	19.70
Other	5.76	6.80	7.42	7.04	8.97	10.85	7.86
Job type (%)							
Producer	6.95	11.65	4.55	4.69	6.51	6.84	6.56
Enotechnician	6.71	7.04	5.02	2.74	4.67	4.01	4.64
Restaurateur	11.51	10.19	5.50	5.43	12.41	6.84	8.71
Trader	5.52	9.22	5.02	3.95	4.18	6.37	5.31
Sommelier	6.95	7.28	3.59	3.46	3.81	3.07	4.43
Bartender	8.87	11.89	5.50	6.67	8.97	12.26	8.74
Other	53.49	42.73	70,82	73.06	59.45	60.61	61.61
Total: n (%)	417 (12.66)	412 (12.5)	418 (12.7)	810 (24.6)	814 (24.7)	424 (12.9)	3295

represented by larger samples, as reported in Table 3. This table describes the distribution of the interviewees, in the whole sample and in the countries' subsamples, by sex, age, education level, occupational category and some job types. The data set was characterised by the following: 49.29% male, a mean age equal to 42.39 years and more than the 75% in the age class 25-64. The respondents were older than 16 at the time of the interview, with a mean age ranging from 36.5 for individuals from Slovenia to 45.7 for those from Germany. More than 50% had a high school diploma or a university degree, and over 60% were employed or self-employed. Moreover, about 38% of interviewees were occupied in jobs related to the wine sector (producers, enotechnicians, traders, etc.).

The sample, although not statistically representative, presented different distributions for key socio-demographic variables across countries (see Table 3), reflecting the heterogeneity of both those who consume wine (see Figure 1) and their choices to consume organic or cooperative-produced wines.

The interviewees were asked about their wine consumption and purchase behaviour. The different demographic attributes are shown for each country in Figure 1. In particular, they were asked about their consumption preferences (Figure 1A), their frequency of wine consumption (Figure 1B), their usual place of wine purchase (Figure 1C), and their ranking of four wine categories (Figure 1D).

In general terms, 41.9% of respondents preferred wine, and 32.4% preferred beer (1A). The preference for wine was highest (52.3%) among Italian respondents, who also had the lowest preferences for spirits and any

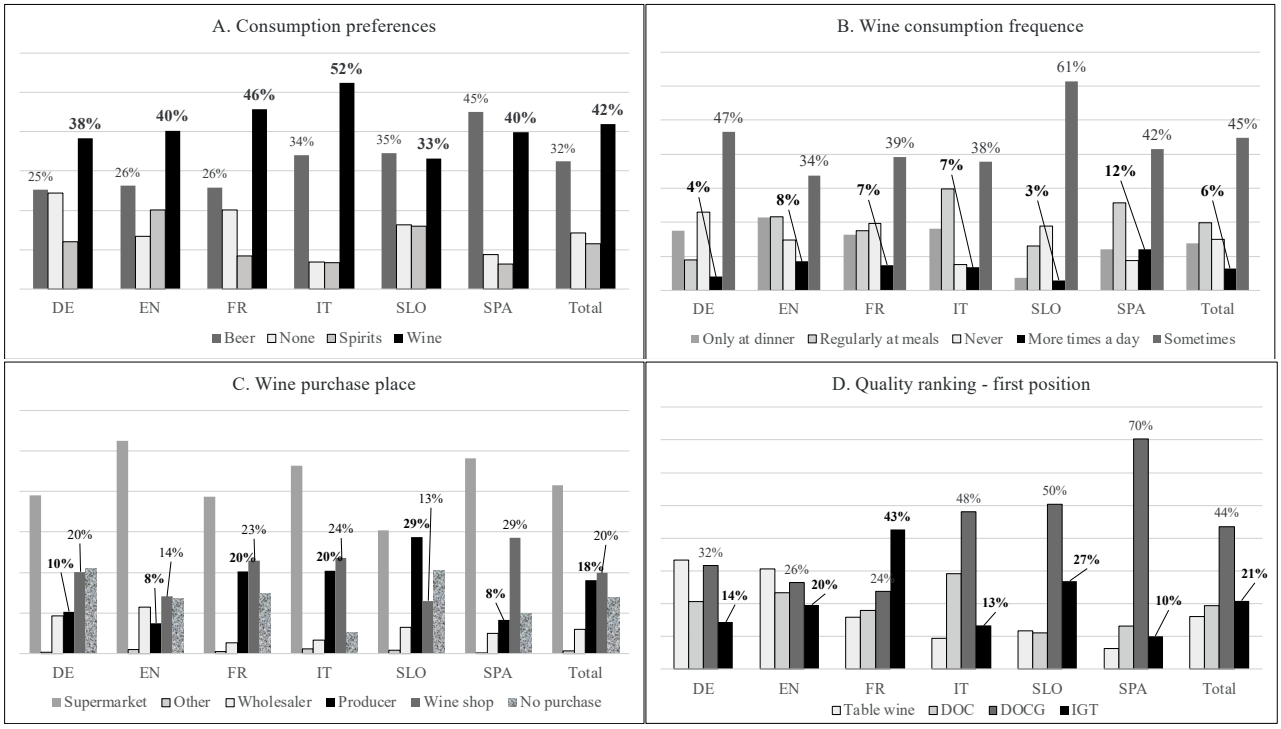

Figure 1. Descriptive statistics by country. Percentages of individuals by (A.) consumption preferences (bold % for "wine"); (B.) wine consumption frequency (bold % for "more times a day"); (C.) wine purchase place (bold % for "producer") and (D.) first position in subjective wine quality ranking (bold % for "IGT"). All the factors considered are significantly associated with country of residence (Pearson p-value).

other alcoholic beverages. Drinking preferences clearly depict a significant heterogeneity across countries, which is coherent with the declared wine consumption frequency (1B). In terms of frequency, 44.9% of respondents declared that they drink wine occasionally, while 14.9% said that they never drink it. While the Italian sample presents the highest percentage of regular wine drinkers at meals, respondents from Spain are more likely to drink it several times per day. Of the total respondents, 41.55% purchase wine in a supermarket, while those who purchase wine from a producer are more likely to come from wine-producing countries, such as Italy, France and Spain. As expected, all the aspects related to consumption, purchase and quality were significantly correlated with the country of residence (p-value<0.01 for the Pearson chi-squared tests in all two-way contingency tables). The differences displayed by respondents from different European countries were statistically relevant in terms of their subjective knowledge of organic wines and cooperative-produced wines, as reported in Figure 2. Almost one-half (49.4%) of respondents claimed to know organic types of wines, while fewer (43.5%) claimed to know about wines produced by cooperatives. Italy, France and Slovenia were the most likely (69.4%, 53.8% and 41.5%, respectively) to know about wines made by cooperatives. Such a result may be explained by aspects related to the production sector. Individual and contextual factors affecting knowledge of these specific types of wine are described in the next section, both by means of univariate analysis and in a multivariate generalised linear model.

4.2 Organic and cooperative wine: Statistical assessment of consumers' factors of familiarity

A relevant focus in this study regards the evaluation of the individual and contextual factors affecting the knowledge of organic and/or cooperative wine. Subjective knowledge was assessed simply by asking to respondents if they knew organic or cooperative produced wines, then this set of two binary outcomes allowed to deepen the role of individual and contextual factors on the probability of knowledge of these types of wines jointly. In the sample, 49.4% of respondents declared themselves familiar with organic wine, but this percentage is substantially different across countries (Pearson chi-squared test 111.9 with p-val-

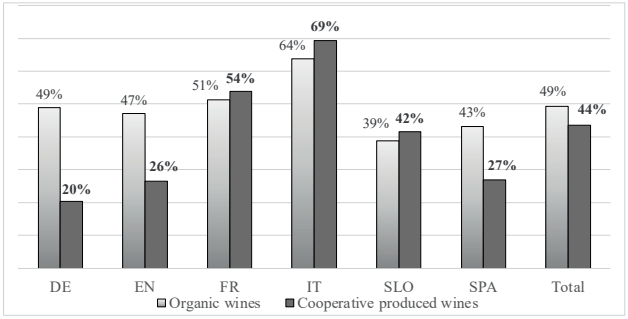

Figure 2. Percentages of respondents who declared to know organic wines (light grey) and cooperatively produced wines (dark grey and bold percentages), by country. The knowledge resulted to be significantly associated with country of residence (Pearson p-value).

ue<0.000), ranging from the lowest in Slovenia (38.8%) to the highest in Italy (63.8%) (Figure 2). Familiarity with organic wine appears to be significantly correlated with some individual aspects, as reported in Table 4. A higher familiarity with organic wine characterised individuals from Italy, in the 25-44 age class, with a high school diploma or university degree, who are employed, who declared that wine is their preferred drink, who drink wine sometimes, buy wine at the supermarket or in specialised stores and who rank Controlled and Guaranteed Designation of Origin (in Italian "Denominazione di Origine Controllata e Garantita" - DOCG) in the first position.

Figure 2 also shows the distribution across countries in relation to familiarity with cooperative-produced wines. The country of residence is also relevant in terms of familiarity with this type of wine (Pearson chi-squared test 427.2, p-value<0.000), which ranges from the lowest in Germany (20.4%) to the highest in Italy (69.4%).

Some individual characteristics beyond the country of residence were also associated with familiarity with cooperative-produced wines (see Table 4). Males in the 25-44 age group with a high school diploma or university degree, who are employed, who prefer to drink wine, who purchase wine at the supermarket, who drink sometimes, and rank DOCG wines in the first position were more likely to be familiar with cooperative-produced wines. Knowledge about organic and cooperative wines was associated with some jobs related to the wine sector.

Similarities between the respondents' familiarity with organic wines and cooperative-produced wines justified the adoption of the bivariate model for the probability of knowledge, which is useful to evaluate the effect of individual and contextual factors in potentially associated equations: familiarity with organic wine and with cooperative wine.

In fact, familiarity with organic and cooperative-produced wines has been analysed in a multivariate framework, by means of a multivariate probit model estimated using the Stata biprobit procedure as suggested in Mullahy [51]. This command allowed for the estimation of a two-equation seemingly unrelated probit model to assess the effects of factors on the joint conditional probability of knowing organic and/or cooperative wines. The estimated coefficients in the two equations, together with standard errors and significance levels are reported in Table 5.

The first interesting evidence is the significant correlation between the random parts of the two model equations, which suggests an association between the random/unexplained components of the subjective knowledge about the two types of wine. Several similarities can be observed, also, in terms of factors affecting the knowledge, except for some aspects related to the contextual trading and producing differences across countries and/or relative to the specific jobs connected to the wine sector. While all countries have a lower probability of knowing about cooperative-produced wines, with respect to Italy, only respondents from England, Slovenia and Spain are less likely to know about organic wines. Age and sex do not affect familiarity with organic and cooperative wines, but higher education levels (i.e., university degree) are positively associated with the knowledge of both wine types. Entrepreneurs and employees are more likely to be familiar with both organic and cooperative wines. This last category is significantly more known by retirees also. Producers, traders and bartenders are more familiar with cooperative wines; restaurateurs and traders are more likely to know about organic wines. Consumption preferences and habits are clearly associated with a propensity towards organic and cooperative-produced wines; they are more likely to be known by individuals who consume wine, even not regularly, and by those who prefer wine with respect to beer or other alcoholic drinks. Moreover, preferences in terms of drinks correlated with knowledge of cooperative-produced wines.

4.3 Sustainable consumption choices: The random parameters logit model results

To investigate factors affecting individual choices an RPL model has been adopted. Its formulation is a one-level multinomial logit model, for individuals i = 1,...,N in choice setting t, and it is somewhat similar to the random coefficients model for linear regressions. This model is widely used for the analysis of discrete CE data. Table 6 reports on the RPL estimation results.

Table 4. Descriptive statistics and test of association between individual factors and knowledge about organic and/or cooperatively produced wine.

	Knowledge about organic wines		Knowledge about cooperative-produced wines	
	Percentage	p-value	Percentage	p-value
Gender		-		<0.05
Males	50		51.85	
Females	50		48.15	
Age classes		<0.01		<0.01
16–24	11.36		12.07	
25–44	46.56		45.64	
45–64	32.13		30.84	
65+	9.95		11.44	
Education level		<0.01		<0.01
Primary school	2.83		2.44	
Secondary school	15.05		16.33	
Some high school	11.18		11.86	
High school degree	33.42		34.75	
University degree	32.86		31.26	
Other	4.67		3.35	
Occupation		<0.01		<0.01
Entrepreneur	10.38		10.47	
Employee	54.05		51.50	
Self-employed	3.69		3.91	
Retiree	10.81		12.28	
Student or housewife	16.15		16.75	
Other	4.91		5.09	
Job type				
Producer	10.63	<0.01	11.65	<0.01
Enotechnician	7.31	<0.01	7.75	<0.01
Restaurateur	12.41	<0.01	12.35	<0.01
Trader	9.21	<0.01	10.12	<0.01
Sommelier	7.13	<0.01	7.82	<0.01
Bartender	12.29	<0.01	13.19	<0.01
Consumption preferences		<0.01		<0.01
None	4.98		4.82	
Beer	29.18		31.61	
Wine	56.39		54.36	
Other drink	9.46		9.21	
Consumption frequency		<0.01		<0.01
Never	3.93		4.88	
Sometimes	38.82		37.61	
At dinner	19.96		19.61	
At meals	26.66		26.87	
Several times a day	10.63		11.03	
Purchase place		<0.01		<0.01
Supermarket	36.00		34.26	
Wholesaler	7.56		8.09	
Specialised store	27.40		25.40	
Producer	24.26		27.84	
Other	0.68		0.70	
No purchase	4.12		3.70	
Quality ranking, First position		<0.01		<0.01
Table wine	12.65		13.05	
Controlled Designation of Origin - DOC	21.38		21.63	
DOCG	45.58		43.34	
Typical Geographical Indication - IGT	20.39		21.98	

The random parameters were chosen according to the significance of the derived standard deviation by running a number of RPL models including different random parameters as suggested by Hensher et al. [71]. Several RPL model specifications were tested and two variables (i.e. "winescape" and "cooperative") presented a significant level of heterogeneity. Winescape and cooperative were consequently considered random parameters in the RPL model and were assumed to have a normal distribution [71].

The RPL model shows an acceptable interpretative capacity (McFadden Pseudo R-squared = 0.16). All the coefficients are statistically significant ($p<0.05$). The same applies to the interaction terms with the sole exception of the interaction term "Cooperative x Female", which describes the interaction between female gender and cooperative wine variables. As expected, the price estimated coefficient is negative.

The most relevant characteristics affecting the interviewees' utility are the place of production and the presence of the European Union PDO quality label. Similarly to other studies [72], respondents proved to be particularly interested in the origin of the wine. However, cooperative production is able to increase respondents' utility. The negative value of the evocative landscape may be due to a poor visual representation of this attribute in the CE experiment.

Table 5. Estimation results of the seemingly unrelated probit model on knowledge about organic and cooperative-produced wines.

	Organic wines		Cooperative-produced wines	
	Coeff.	SE	Coeff.	SE
Country (Italy, base category)				
Germany	-.0620	.0904	-1.3459***	.09830
England	-.4727***	.0876	-1.3843***	.0949
France	-.1132	.0875	-.2670***	.0884
Slovenia	-.3653***	.0779	-.5015***	.0783
Spain	-.6201***	.0849	-1.3130***	.0899
Sex (1, male)	.0207	.0506	.0512	.0520
Age class (16–24, base category)				
25–44	.1063	.0806	.0607	.0820
45–64	.0877	.0860	.0920	.0882
>64	.0513	.1307	.2548	.1374
Education (none, base category)				
Secondary school degree	.0392	.1336	.1908	.1409
Some high school	-.0205	.1418	.2160	.1759
High school diploma	.2215	.1328	.1892	.1410
University degree	.3837***	.1343	.2796**	.1418
Other	.4309***	.1637	.2160	.1759
Occupation (student/no occupation, base category)				
Entrepreneur	.2993***	.1049	.4047***	.1072
Employee	.1897***	.0707	.2380***	.0738
Self-employed	-.0536	.1409	.1202	.1441
Retiree	.0326	.1176	.3888***	.0944
Other	.0025	.1055	.0477	.1103
Job type (dummies)				
Producer	.1961	.1379	.3915***	.1363
Enotechnician	.1697	.1519	.0943	.1465
Restaurateur	.3575***	.1033	.1347	.1023
Trader	.3894**	.1619	.5642***	.1580
Sommelier	-.0984	.1602	.0352	.1594
Bartender	.1945	.1060	.3595***	.1074
Preferences (none, base category)				
Beer	.1815	.1034	.3596***	.1099
Wine	.5432***	.1056	.5208***	.1127
Other alcoholic drinks	.1590	.1146	.3089**	.1221
Consumption frequency (no consumption, base category)				
Sometimes	.6664***	.1021	.4209***	.1059
At dinner	1.1223***	.1223	.9308***	.1261
At meals	1.0754***	.1157	.8312***	.1194
Several times a day	1.4557***	.1519	1.2696***	.1525
Constant	-1.3292	.1642	-1.0763***	.1693
athro	.4311*** (.0343)			
ρ	.4062 (.0286)			
Wald test for rho=0 (chi2 test)	158.21 (p-value <0.000)			

The opt-out option effect is negative and statistically significant, indicating a utility loss due to the "no buy" alternative.

The structure of the adopted model pointed out random parameters for the winescape and cooperative attributes, assuming that their heterogeneity was explained by the employee and female covariates. On the one hand, this structure of mixed effects is confirmed by the parameters' significance. On the other hand, the effects of the remaining attributes are invariant across individuals. The model specification was based on the assumption of normally distributed random parameters.

The respondents' WTP wine with a PDO label is equal to €3.07. The WTP Friuli Venezia Giulia Region wine is €2.77, while the choice of a bottle from other EU countries decreases respondents' utility since it leads to a negative WTP (€-5.91). With regards to the organic wines, respondents showed a willing to pay an increase equal to € 1.88 for organic wines in comparison to table wines.

In terms of the winescape attribute, the findings show a negative WPT (€ -2.71), on average. However, this willingness becomes positive for people who are employees (€1.96) and for females (€ 1.07) reducing total negative resulted WTP.

With reference to the cooperative wines, the WTP is on average positive (€ 1.15), meaning that the interviewees are willing to pay a premium price for this type of wine. It is interesting to note that the model highlights the presence of several market segments that cooperative wines may target. The propensity to buy cooperative wines increases in the case of people who are employees. On the contrary, females seem to be less attracted by this kind of production.

Table 6. Estimation results of RPL model.

The choice alternatives	Coeff.	SE	z	P-value	WTP (€/ bottle 750 ml)
Random parameters in utility function					
Winescape	-.2941***	.0480	-6.13	.0000	-2.71
Cooperative	.1243**	.0588	-2.11	.0347	1.15
Non-random parameters in utility functions					
Opt-out	-1.5306***	.0461	-33.22	.0000	
Price	-.1084***	.0035	-31.36	.0000	
Friuli Venezia Giulia	.3005***	.0245	12.24	.0000	2.77
Other EU	-.6412***	.0358	-17.92	.0000	-5.91
PDO	.3329***	.0252	13.22	.0000	3.07
Organic	.2040***	.0303	6.72	.0000	1.88
Heterogeneity in mean					
Winescape: Employee	.2122***	.0515	4.12	.0000	1.96
Winescape: Female	.1164**	.0478	2.43	.0150	1.07
Cooperative: Employee	.1847***	.0587	3.15	.0017	1.70
Cooperative: Female	.0904*	.0546	1.66	.0978	0.83
Dist. of Random Parameters – Std. Dev.					
Normal: Winescape	.8918***	.0304	29.34	.0000	
Normal: Cooperative	1.1660***	.0314	37.17	.0000	

***, **, * Significance at 1%, 5%, 10% level.

5. CONCLUSIONS

In response to our initial targets, which were to explore consumers' attitudes and preferences towards wines produced by cooperatives and the level of appreciation of both the social role of cooperatives and the environmentally friendly aspects of organic wines, our analysis discovered that the knowledge of organic wines and wines produced by cooperatives is significantly tied to and affected by similar individual and contextual factors. The structure of the survey across different countries allowed for consumers' heterogeneity to be wider in terms of attitudes, consumption and purchase habits towards wine.

Results of this study contribute to a very limited literature examining how consumer preferences differ across wines produced by cooperatives. The findings of this exploratory study suggest the usefulness of different methodological approaches in examining the wine cooperatives market and in assessing the relevance of each aspect of sustainable consumption behaviour.

In addition, our analysis points out, on the one hand, that the negative prejudice towards wine cooperatives seems to persist; on the other hand, it shows that more and more consumers seem to be willing to choose a wine produced by a cooperative. The increasing quality level of these wines and the social sustainability aspects related to cooperatives may be reasons to prefer these wines. In this sense, enhanced communication through labelling and the adoption of quality certifications might improve the image of wine cooperatives.

As wine consumers evolve and become more demanding of quality as well as of sustainability, cooperatives could further enhance their fundamental contribution in satisfying these needs by improving enological level providing adequate technical assistance, and, consequently, by contributing to enhancing the local community, through economic activities [73] and through territory development according to sustainability.

Our findings offer useful information for the marketing of wine cooperatives seeking to promote the sale of their wines by differentiating their products in a highly competitive market. In these types of markets, in fact, wine differentiation is an important aspect in favour of cooperative longevity and marketing sustainability efforts (e.g. through specific information/labels) and could be a potential means of achieving this goal. The detailed results provide cooperatives with indications about what kind of consumers would be interested in buying their wines, providing them with practical recommendations on how to better market their wines. In addition, this study may contribute positively to the debate on the relationship between the preferences of wine cooperative consumers and their organic choices. The results describe how familiar consumers are with organic and cooperative-produced wines, pointing out the opportunity for wines produced by cooperatives to better target the market segments that mainly choose organic products [74].

The positive and statistically significant premium price attached to wine produced by cooperatives shows that cooperatives could charge an additional premium on wine if they produced using sustainable practices. Maybe they could also attract new consumers by communicating more effectively the characteristics of their wines. Organic products command a premium price with consumers. With this knowledge, cooperative producing wines will be better equipped to handle eventual specific investment decisions, while both differentiating their wines in a saturated market and reducing their environmental footprint. This could be particularly useful for smaller cooperatives, which often have tighter financial situations and the decision to make investments in cleaner technologies is often risky due to huge upfront capital costs.

In evaluating these findings, however, readers should recognise that our research has some limitations. The first is related to the sample considered: this study is

limited by its convenience sample and its consequent inability to generalise findings to consumers other than respondents. According to Vecchio [75], this limit reduces market implications of our findings. Two other limitations refer to the experiment. First, considering that including other countries was very expensive for our research, the use of a limited number of countries could be considered a limitation of this study. Further research in less similar countries should be conducted in order to improve our knowledge about the potential consumers' attitudes and preferences in different contexts.

Second, given the scope of the survey data, not all aspects of cooperative wines have been included in this study (e.g. cultural and socio-political aspects), according to Demossier and Viecelli [76]. Therefore, we suggest that future studies incorporate consumer opinion on a larger spectrum of cooperative wine characteristics and expand on the number or type of sustainability attributes also. In addition, since studies about pandemic impacts on wine consumption are still scarce [77,78], it would be interesting to investigate preferences after the pandemic, in order to evaluate possible consumers' modifications in wine consumption behaviour or in propensity towards sustainability aspects during and after the pandemic.

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