Analysis of performances and trends of PDO wine producers in large retail chains in Italy

Andrea Dominici[1], Francesca Gerini[2,*], Leonardo Casini[2]

[1] *Department of Land, Environment, Agriculture and Forestry, University of Padua, Via dell'Università, 16, 35020 – Legnaro (PD), Italy*
[2] *Department of Agriculture, Food, Environment and Forestry (DAGRI), University of Florence, Piazzale delle Cascine, 18, 50144 – Florence, Italy*
Email: andrea.dominici@unipd.it; francesca.gerini@unifi.it; leonardo.casini@unifi.it
*Corresponding author.

Abstract. The large retail chains represent the main distribution channel for wine sales in Italy. Retailers, therefore, define the wine supply of their points-of-sale based on their own commercial strategies, taking into account evolving consumer demand, producer characteristics, and product types. Wine bottles from different producers with varying characteristics, sales performances, and commercial trends can be found on shelves next to each other. The aim of this study is to investigate the performance of various producers whose wines were sold in large retail chains in Italy before the pandemic. This analysis enabled us to observe market trends without disruptions. We focused on the two most sold Protected Designation of Origin (PDO) wines, Chianti DOCG and Montepulciano d'Abruzzo DOC. For this purpose, cluster segmentation was implemented using variables related to sales (value of sales, number of labels, average price, discount units, discount percentage, units sold above a certain price), and sales trends of each producer present in large retail chains with these products. The results show that, although there are different trends and commercial strategies among the producers of each of the two denominations of origin, there are similarities between the clusters of the two different denominations. In particular, in the domain of large-scale retail, wine sales are dominated by a few wineries with a strategy based on high sales volume, a wide range of labels, low prices, and promotional sales. The remaining sales refer to wines from producers with different characteristics that record positive sales trends and producers characterised by the declining value of sales. The identified results provide valuable insights for a better understanding of the dynamics of the large retail chain in Italy.

Keywords: scanner data, PDO wines, Chianti DOCG, Montepulciano d'Abruzzo DOC, market segmentation.

1. INTRODUCTION

Over time, large retail chain (LRC) in Italy has gained an increasingly important role in the wine market, representing the main distribution channel for domestic sales of the most important wineries [1,2]. Numerous domestic and international producers are therefore competing for space on supermarket shelves. However, the presence of wines in LRC is influenced by

both the policies and commercial strategies of the distribution system and the characteristics of the producers and the type of product made [3]. In their search for wine supply, LRCs have to deal with a complex competitive landscape ranging from large companies producing numerous labels to small producers of few niche wines. Retailers choose the wine assortment in stores according to their business strategies, which in most cases are based on the listed retail "margin", thus an economic motivation as a result of sales and profit [4]. To optimise economic performances and reach target volumes, supermarkets therefore resort to specific pricing policies, setting prices more competitively than other shops and utilizing promotional sales [5-8].

However, expanding the criteria for selecting producers and products may enable retailers to enhance store loyalty by creating and strengthening a distinct store image [9]. Goodman and Habel [4] have shown that, in addition to economic "margin", other factors contribute to large retailers' choice of wine bottle supply, such as the presence of awarded wines and customer demands. Consumer demand for wine has strongly changed in recent years [10-12], but it seems to have polarised towards two purchasing behaviours [6]. On the one hand, a segment of consumers bases its choices mainly on price. On the other hand, the demand of another segment of consumers is directed towards higher quality standards [13]. While the former segment finds an answer in competitive prices and promotional sales, the latter type seeks higher-quality wines with recognisable cues such as denomination of origin or awards [14-17].

To meet evolving consumer demand and satisfy the segment of customers interested in higher quality products, retailers have reorganised their wine supply over time, increasing the number of labels on the shelves and focusing on high-quality cues such as denominations of origin. In 2017, sales of wine with geographical indication accounted for the majority value of still and semi-sparkling wine sales in LRC (80% of the total). Within this category, PDO wines accounted for 54% of sales, while Protected Geographical Indication (PGI) wines made up 26% [2]. These data are even more interesting when analysed over the long term: the value of sales of PDO and PGI wines progressively increased between 2009 and 2017, by 22.8% and 9.7%, respectively [2]. This quantitative and qualitative reassortment has broadened the range of wine suppliers that retailers have sought out. Traditionally, LRC has favoured partnerships with large wine producers, characterised by high production volume, a wide assortment, and established brand recognition. These large producers, whether private companies or cooperatives, are well organized structurally and have financial resources

that allow them to interact directly with the final distributor, thereby reducing the need for intermediaries, which are often essential for smaller businesses. Moreover, these large wine producers find in LRC an optimal sales channel, also because with their strong brands they can create a solid bond of loyalty with final consumers [18]. However, the qualitative diversification of retail assortments towards wines with geographical indications has provided smaller producers with opportunities to access supermarket shelves, albeit often limited to a local scale or within the producer's geographic area. These include producers who previously exclusively targeted other distribution channels, as well as small- to medium-sized producers with limited production and lesser-known brands, who had never engaged with LRC due to the risk of seeing their bottles unsold for a long time [19].

Given the increasing significance of sales of wines with geographical indications in LRC, this study wants to investigate the characteristics of PDO wine producers by identifying and analysing their commercial performances. In particular, this study seeks to address the following research questions: i) among PDO wine producers, is it possible to identify homogeneous groups sharing same sales performances and strategies? ii) How do these groups differ in terms of sales prices, sales values, and discount percentage? iii) What sales performances and price trends have characterized these groups over time? Using sales data of LRC in Italy spanning from 2009 to 2017, the focus is on producers of the two most sold PDO wines in Italian LRC: Chianti DOCG (Controlled and Guaranteed Designation of Origin) and Montepulciano d'Abruzzo DOC (Controlled Designation of Origin). This approach enables an evaluation of both the performances of producers within the same denomination, providing a comprehensive overview of each denomination, and an assessment of whether there are shared dynamics and strategies among producers of different denomination wines in LCR. The performances and strategies of producers were investigated through Hierarchical Cluster Analysis (HCA) using scanner data sourced from Infoscan Census, the retail tracking service of the IRI company. Specifically, sales of still and semi-sparkling wine made during the period January 2009 to December 2017 were gathered and classified. The stable period before the pandemic, with few significant disruptions, allowed us to analyse wine sales in Italian LCR and to observe market trends driven by demand, supply, and corporate strategies without distortion.

This research enriches the existing literature by offering insights into the supply of denomination wines through the analysis of real nine-year sales data achieved in the main wine distribution channels [1]. Few

studies have comprehensively analysed the dynamics of wine sales from various producers within LRC in an aggregated manner. The findings offer valuable insights for all the stakeholders involved in the wine chain, highlighting the strategies and performances that have proven most successful in driving consumer purchases over a nine-year period in LRC.

The remainder of the paper is organised as follows. Following the introduction, we present a literature review on wine sales in LRC and illustrate the case study that served as the basis for our analysis. Subsequently, we detail the methodology employed and present the study's results. Finally, in the "Discussion" and "Conclusions" sections, we analyse the findings, discuss their managerial implications, and address any encountered limitations.

2. THE WINE SALES IN LRC

Consumers have various options for purchasing wine, but LRC in Italy is steadily growing in importance. As previously mentioned, the majority of wine sales (38.8%) occur in LRC, surpassing the second-largest channel, hotels/restaurants/cafés (HoReCa), by more than double, accounting for 17.1% of total sales. The relevance of LRC is underscored by the growth in the value of sales, which for still and semi-sparkling wines rose from 1.422 to 1.604 million euros in the period 2009-2017, representing a growth of approximately 13% [2].

The success of wine sales in LRC can be attributed to the features of this channel, as well as its ability to meet consumer needs. Firstly, consumers appreciate the convenience of buying all their groceries in one place [20]. In this regard, LRC represents an ideal location for buying wine alongside other grocery items [21]. Additionally, LRC has considerably expanded its wine supply, now offering a great selection of products in terms of both price and quality [22]. For example, between 2009 and 2017, the number of European Article Number (EAN) codes for still and semi-sparkling wines sold in Italian LRC increased by 8.5%, from 20,533 to 22,273 labels [2]. LRC increasingly prioritize wine visibility in stores, showcasing bottles prominently on shelves or in specially demarcated areas within the wine department [18]. Moreover, LRC has enhanced the customer interaction by training staff to provide advice on wine tasting and food pairings. In this direction, an Italian supermarket chain has introduced a virtual sommelier in their stores, a digital totem that recommends wine purchases tailored to consumers' preferences or needs. [23].

Among all the distribution channels, the extensive selection offered by LRC is highly valued by low-involvement consumers [24-25]. These consumers con-sider price-based cues the most important determinants in purchase decision [26], and LRC typically offer more competitive prices compared to other retailers [6]. Moreover, special offers or other types of price promotion are sale strategies typically employed by LRC [7]. According to Casini et al. [27], price cutting is the most common promotion strategy for wine, with discounts ranging from 10% to 50% off the original price, while other forms of discounting like "Buy one get one free" or "Buy-two-get-third-free" promotions are less common. Discounted products are often displayed for easy access and high visibility, using end of aisle gondolas or special mark on the labels. Price discounts have a high impact on consumer choice [28], especially among low-involvement wine consumers [29].

Meanwhile, the wide array of options available at LRCs satisfies consumers seeking for higher-quality wines with recognisable cues, such as denomination of origin, awards, or sustainability attributes [14-17, 30]. As outlined earlier, the sales value of PDO and PGI wines has shown a consistent upward trend in LRC, with PDO accounting for more than half of the total sales value [2]. Moreover, the study of Di Vita et al. [31] further underscores the significant role of modern distribution channels in the purchase of both PDO and PGI wines, as well as basic wines.

Socio-demographic and individual characteristics also influence the choice of the distribution channel for wine purchases. In a study of the UK market, Ritchie [29] found that women prefer purchasing wine in supermarkets, whereas men prefer specialized wine shops. Generation Z members (those born after 1996) and Millennials (those born between 1981 and 1996) consider supermarkets their favourite channel for buying wine [32,33]. In a cross-country study on wine purchasing behaviour in Germany and Hungary, Szolnoki and Totth [34] found that wine consumers with higher incomes tend to purchase minimal wine from discount stores and spend more money on wines sold at wine stores or bought directly from wineries. Conversely, wine drinkers from lower social classes typically buy wine from grocery stores. The greater variety of wines and brands available on LRC shelves makes it an appropriate distribution channel for consumers seeking novelty or those inclined towards switching behaviours [35].

3. CASE STUDY

Chianti DOCG and Montepulciano d'Abruzzo DOC emerge as the most sold PDO still wines in Italian LRC. Our analysis of IRI Infoscan Census data reveals that Chianti DOCG wine consistently ranks as the highest-
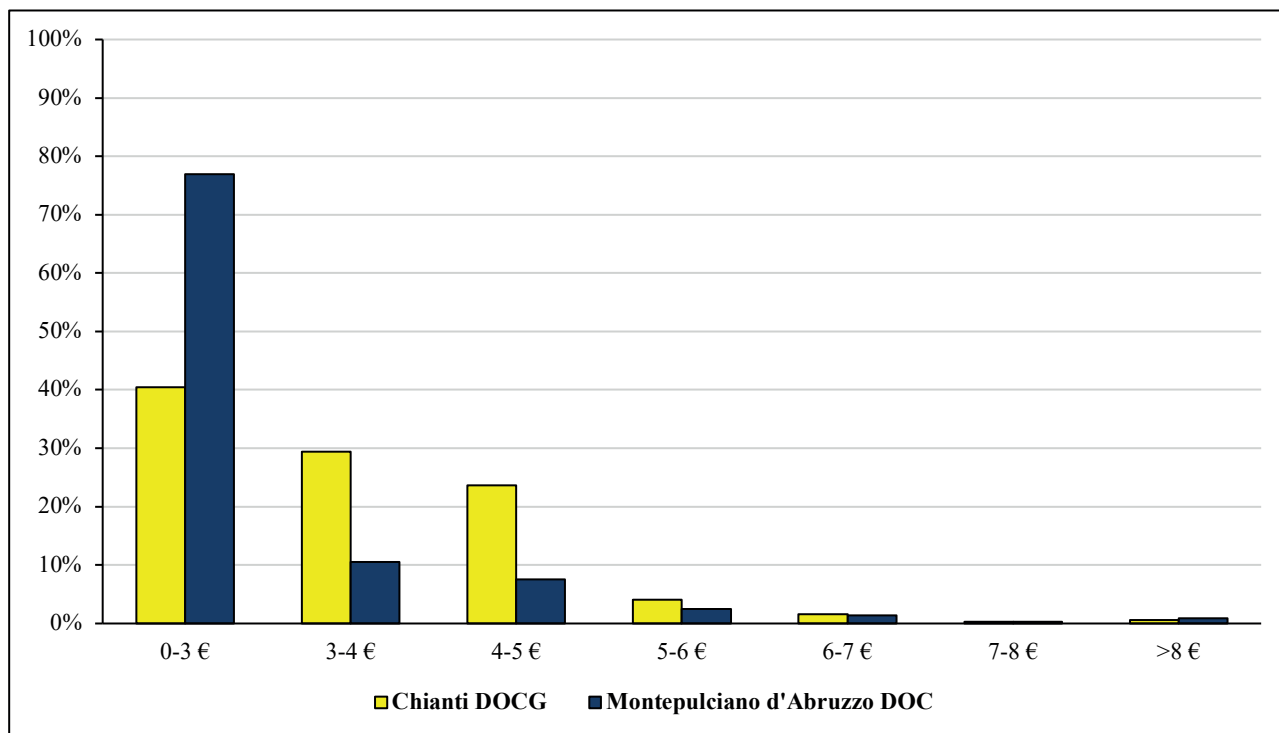
Figure 1. Distribution of sales in units (percentage of the respective denomination) by price range of 0.75-litre bottles of Chianti DOCG and Montepulciano d'Abruzzo DOC (year 2017). Note: Our elaboration on IRI data.

selling denomination in terms of value at Italian LRCs from 2009 to 2017, with sales revenues reaching 46.2 million euros in 2017 (equivalent to 5.38% of total DOC/DOCG wine sales) and experiencing a 21.9% increase in sales value over the period. Montepulciano d'Abruzzo DOC follows closely as the second most sold denomination in LRC, generating total sales of 32.4 million euros in 2017 (3.78% of total DOC/DOCG wine sales) and witnessing a 3.4% increase in sales value from 2009 to 2017.

Chianti DOCG wine, made with at least 70% Sangiovese grapes, is a red wine produced in a vast territory in the centre of the Tuscany region. As of 2017, the vineyards dedicated to Chianti DOCG covered 14,266.30 hectares [36]. On the other hand, Montepulciano d'Abruzzo DOC wine is a red wine produced in the coastal hills and foothills of the Abruzzo region. The specification of the denomination, recognised in 1968, requires wines to be made from at least 85% Montepulciano grapes. In 2017, there were 9,325.13 hectares belonging to the Montepulciano d'Abruzzo DOC area [37].

According to ISMEA [38], in 2017 Montepulciano d'Abruzzo DOC and Chianti DOCG ranked as the most produced still PDO wines in Italy in terms of volume. Montepulciano d'Abruzzo DOC stood as the second most produced appellation after Prosecco DOC

(the most produced semi-sparkling or sparkling PDO wine in Italy), with a total volume of 834,466 hectolitres, accounting for 5.5% of the total PDO wine production. Chianti DOCG was the third most produced PDO wine, with a volume of 751,334 hectolitres, representing 4.9% of the total PDO wine production.

In terms of sales in supermarkets by format in 2017, Chianti DOCG wine was exclusively sold in glass bottles in accordance with production regulations. The majority of unit sales were attributed to 0.75-litre glass bottles (96.2% of the total sales), with a smaller portion sold in 1.5-litre glass bottles (1.2% of the total sales).

Montepulciano d'Abruzzo DOC wine was predominantly sold in glass containers (99.6% of total units sold), with only a minimal percentage sold in 3-litre or 5-litre bag-in-box formats (0.4%). Within glass sales alone, the majority were in 0.75-litre bottles (89.8% of total units sold) and 1.5-litre bottles (6.1% of total units sold), with a smaller proportion in 5-litre containers (3.4%).

The analysis of IRI Infoscan Census data for 2017 reveals that the average price paid by consumers, inclusive of promotional sales, was 3.57 euros for a 0.75-litre bottle of Chianti DOCG and 2.82 euros for a bottle of Montepulciano d'Abruzzo DOC. Figure 1 shows the distribution of unit bottle sales for Chianti DOCG and

Montepulciano d'Abruzzo DOC across various price ranges in 2017. As regards Chianti DOCG, the majority of sales fell within the under 3 euro range (40.5% of the total), followed by the 3-4 euro range (29.4%) and the 4-5 euro range (23.7%). Sales in the 5-6 euro range constituted 4.1% of total sales, while those above 6 euros accounted for only 2.4% of the total. In contrast, sales of Montepulciano d'Abruzzo DOC were heavily concentrated in the under 3 euro range, comprising over three-quarters of total sales (76.9%). The remaining sales were primarily distributed between the 3-4 euro range (10.5%) and the 4-5 euro range (7.5%), with only 5.0% sold in the over 5 euro range. An initial analysis of sales value in 2017 at LCR reveals a highly concentrated market for both denominations. For Chianti DOCG, the top five producers collectively accounted for 47.4% of the total sales value, a percentage that rose to 67.5% when considering the top ten producers. In the case of Montepulciano d'Abruzzo DOC, market concentration among a few key producers was even more pronounced, with the top five producers representing over half of total sales value (58.8%), and the top ten accounting for 75.9% of the total.

4. METHOD AND MATERIALS

The analysis of wine sales trends from 2009 to 2017 related to the Chianti DOCG and Montepulciano d'Abruzzo DOC denominations was conducted using a database containing scanner data sourced from IRI Infoscan Census. This database encompasses sales of both still and semi-sparkling wines throughout Italy, specifically in LCR, which includes hypermarkets, supermarkets, self-service stores (superettes + minimarkets), and discount stores. Store scanner data are collected at cash registers and identify each product sold, defined by an EAN code. For each EAN code, the database reports information such as year and month of sales, brand, producer, type (still or semi-sparkling), colour (red, white, or rosé), geographical indication, format type and volume, and the main grape variety.

To describe and analyse producers' performances and strategies, nine variables were created by processing the available data in the database. These variables concern i) the dimensional aspects of sales (grouped under "Dimensions"); ii) the "Commercial strategies" applied; and iii) the "Dynamic performances" in the period considered for each producer. Each variable pertains to the aggregate volume of wine labelled with the same geographical indication (Chianti DOCG or Montepulciano d'Abruzzo DOC) and sold by individual producer within

Table 1. Variables referred to each producer and categorised by "*Dimensions*", "*Commercial strategies*" and producers' "*Dynamic performances*".

Variables	Description and unit of measure
Dimensions	
SALESVALUE	Average annual value of wine sales (€)
EAN	Average annual number of labels (n°)
Commercial strategies	
UNITPROMO	Percentage of bottles sold in promotion (%)
PRICE	Average annual price (€/bottle)
DISC	Average percent discount on price (%)
UNITOVER	Percentage of units sold above a specific price (%)
Dynamic performances	
TRENDVALUEPROMO	Trend in value of annual sales in promotion (%)
TRENDVALUENOPROMO	Trend in value of annual sales not in promotion (%)
TRENDPRICE	Annual price trend considering total sales (€/bottle)

this commercial channel. The details of the variables are outlined in Table 1.

In the "*Dimensions*" category, the variable "SALESVALUE" denotes the average annual value of wine sales in euro, considering only the years in which the wine was sold in LCR. This variable encompasses all sales, including both those at the base price and those at promotional price. This variable is obtained by dividing the sum of the annual sales value of each producer by the number of years each producer has been present in LCR during the reference period. Given that each producer may offer different wine labels of the same denomination, the variable "EAN" measures the average annual number of different labels sold belonging to the same denomination. This variable is obtained by dividing total number of labels of each producer present on the shelves of LCR each year by the number of years each producer has been present in the LCR during the reference period.

The "*Commercial strategies*" group includes "UNITPROMO", indicating the percentage of units sold during promotional sales out of the total units sold. This variable is obtained by dividing the total number of units sold on promotion by each producer each year by the total number of units sold by each producer during the reference period. "PRICE" identifies the average annual price per bottle in euro calculated across total sales. This variable is derived by dividing the sum of the sales value for each year of each producer by the total number of units sold by each producer within the

reference period. "DISC" represents the average percentage discount on the sales price. This variable is obtained by dividing the difference between the average bottle price (of total sales) and the average promotional bottle price of each producer by the average bottle price (of total sales) of each producer during the reference period. "UNITOVER" refers to the percentage of units sold above a designed threshold price, computed considering the average sales price in the 75th percentile for each denomination. For Chianti DOCG, this threshold price was set at 6 euros, while for Montepulciano d'Abruzzo DOC, it was 9 euros. This variable is obtained by dividing the total number of bottles sold above the threshold by each producer by the total number of bottles sold by each producer during the reference period.

Lastly, the three dynamic variables grouped under "*Dynamic performances*" were measured only for the years in which sales occurred on the market. Specifically, "TRENDVALUEPROMO" and "TRENDVALUENOPROMO" indicate the average percentage variation recorded from 2009 to 2017 for promotional and non-promotional sales value, respectively. These two variables were estimated by performing linear regressions of the percentage of promotional/non-promotional sales on total sales over the years. Similarly, "TRENDPRICE" represents the average change in the average annual price per bottle in euros, estimated by a linear regression of the average annual price per bottle across the selected years.

The selected variables allow us to construct a comprehensive overview of wine producers' primary sales data. This facilitates a thorough examination of their performance and sales strategies, enabling effective addressing of our research questions.

Before initiating the clustering procedure, we applied exclusion criteria to focus specifically on producers with a sustained and significant contribution to the market within the specified denominations. This ensured the robustness and reliability of the subsequent analyses conducted on the HCAs. Firstly, producers labelled as "*Outgoers*", who did not engage in wine sales within the designated denomination in 2017, were excluded. This group likely comprises producers who, for various reasons, ceased operations with LRC in 2017 or in previous years. Secondly, producers classified as "*Incomers*", who had a presence in the designated denomination for less than four years during the last six years of the reference period (2012-2017), were excluded. These are producers who either did not maintain consistent activity throughout the specified timeframe or entered the market relatively recently."

The created variables were used in the HCA to investigate the existence of homogeneous groups of producers selling the same wine denomination in the LRC. Clustering involves grouping objects into distinct sub-groups characterized by high internal homogeneity and high external heterogeneity [39]. The hierarchical clustering process generates a treelike diagram, known as a dendrogram, which visually represents the combinations and divisions of clusters as they are formed. This dendrogram provides valuable insight into the hierarchical structure of the data and the relationships between clusters, facilitating interpretation [39]. Unlike partitioning methods such as k-means, hierarchical clustering does not require specifying the number of clusters beforehand [39]. Instead, it recursively merges or splits clusters based on a chosen criterion, allowing for a flexible and data-driven approach to clustering.

HCA was performed using Ward's method and squared Euclidean distance matrices. Starting from each producer considered as an individual cluster, Ward's method sequentially merges the two most similar clusters that minimize the increase of the total sum of squares across all variables within all clusters [40]. The Ward's method, in conjunction with the utilization of squared Euclidean distance, presents several advantageous features for cluster analysis. Unlike methods solely reliant on optimizing distances between clusters, Ward's method prioritizes enhancing clusters' homogeneity by minimizing the increase in the error sums of squares of deviations from the centroids of the clusters. This approach fosters more cohesive and internally consistent clusters [39]. Additionally, it promotes the formation of clusters of approximately uniform size [39]. This feature is particularly advantageous as it contributes to enhancing the interpretability and comparability of resulting clusters, facilitating more meaningful analyses. Squared Euclidean distance is computed by summing the squares of the differences between corresponding coordinates, eliminating the need to calculate the square root. This method offers the advantage of faster computation, as it bypasses the step of taking square roots. It is the preferred distance measure for centroid-based and Ward's methods of clustering due to its computational efficiency and recommended suitability for clustering techniques [39].

To determine the optimal number of clusters, we initially employed a visual depiction of cluster solutions in a dendrogram. Moreover, we estimated the Variance Ratio Criterion, also recognised as the Calinski-Harabasz pseudo-F [41] and Duda-Hart indices [42]. Higher values of both indices indicate a better definition of clusters. Furthermore, the pseudo-T-squared [43] was examined, a transformation of the Duda-Hart index, where a lower value indicates distinct clustering.

All statistical analyses were performed using the STATA 18 software [44].

5. RESULTS

From 2009 to 2017, 212 producers sold Chianti DOCG wine in Italian LRC at least in one year. Among these, 83 producers exited the market ("*Outgoers*") and 19 were newcomers ("*Incomers*"). Subsequently, we excluded these 102 producers from our analysis, narrowing our focus to the remaining 110 producers who consistently sold their wine for a minimum of four years during the period from 2012 to 2017, including the final year of survey, 2017.

For the implementation of the HCA, a five-cluster solution was identified as the best compromise explaining the data based on a combination of fit statistics and dendrogram analysis (Figure 2). The 5-cluster solution has a pseudo-F statistic value of 41.00. Additionally, it exhibits a high Duda-Hart index of 0.763, surpassed only by the 2-cluster solution with an index of 0.791. However, the pseudo-T value for the 5-cluster solution is lower at 14.94 compared to the 2-cluster solution at 24.81. Each segment presents a distinct profile with respect to the variables included in the HCA, and the mean for each cluster is listed in Table 2.

Cluster 1, consisting of 9 producers (8.2% of the sample), comprises producers who, on average, recorded the highest sales value of Chianti DOCG each year and sold the greatest number of different Chianti DOCG labels (around 10). It is therefore referred to as "*Quantity-oriented*". 68% of the Chianti DOCG wine sold by these producers is sold at promotional prices, with an average discount percentage of 9%. The average price is the second lowest among the various clusters, at 3.25 euros per bottle. Only 1% of the units sold by these producers have a price above the threshold. They are characterized by a positive annual trend in both the value of wine sales at the base price (+3%) and at promotional price (+3%), as well as an annual increase in price.

Cluster 2, comprising only 13 producers (11.8% of the sample), records the second-highest sales values of Chianti DOCG, although it is one sixth of those of Cluster 1. The commercial policy pursued by this group is characterized by the lowest average price (2.89 euros), albeit increasing, and the highest percentage of promotion (81% of the total), with an average discount of 7%. Given this inclination towards promotion, it is referred to as "*Promo-oriented*". No units sold by these producers have a price above the threshold and, on average, they sell around two different Chianti DOCG wines. The
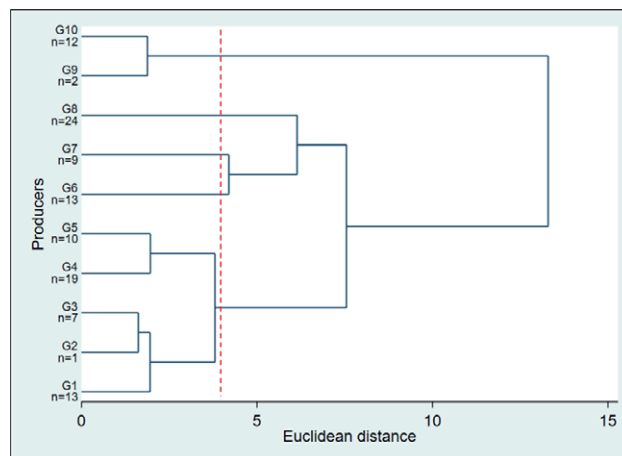

Figure 2. Hierarchical Cluster Analysis dendrogram for Chianti Classico DOCG producers. Note: Our elaboration on primary data.

strategy of these producers seems to be appreciated by consumers, resulting in a positive annual trend in both the value of wine sales at base price (+5%) and at promotional price (+7%).

Cluster 3 includes the highest number of producers (50), accounting for 45.5% of the sample. In this cluster, there are producers who recorded the third-highest average annual sales value (although considerably lower than the "*Quantity-oriented*" and "*Promo-oriented*" clusters), with a percentage of bottles sold at promotional prices equals to 35% of the total and an average discount of 11%. On average, each of these producers sold approximately 1.74 different labels of wine under the Chianti DOCG denomination per year, with 8% of the total bottles sold above the threshold price. The average sales price of wine from this cluster was the second highest in the sample (4.16 euros). These producers show the highest increase in price, alongside a notable decline in the annual sales value of both wine at base price (-11%) and wine at promotional price (-11%). For this reason, this cluster is termed "*Negative performers*".

Cluster 4, conversely, shows the best positive annual trends over the period in terms of both the value of sales at base prices (+26%) and the value of sales at promotional price (+21%), along with a decrease in price. We therefore designate this cluster of producers to "*Best performers*". This cluster consists of 24 producers (21.8% of the sample) with the second-lowest sales value. Units sold in promotions account for 41% of total sales, and the average discount rate is 9%. On average, these producers sell about 1.72 different wine labels under the Chianti DOCG denomination. The average sales price is 3.84 euros, with units sold above 6 euros accounting for only 3% of the total.

**Table 2.** Mean values of the variables describing each cluster of Chianti DOCG.

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
	Quantity-oriented	*Promo-oriented*	*Negative performers*	*Best performers*	*High-price oriented*
SALESVALUE (€)	2,622,429.73	417,848.38	105,496.88	99,359.05	83,923.37
EAN (n°)	9.88	2.07	1.74	1.72	1.56
UNITPROMO	68%	81%	35%	41%	16%
PRICE (€/bottle)	3.25	2.89	4.16	3.84	8.87
DISC	9%	7%	11%	9%	20%
UNITOVER	1%	0%	8%	3%	88%
TRENDVALUEPROMO	3%	7%	-11%	21%	-5%
TRENDVALUENOPROMO	3%	5%	-11%	26%	15%
TRENDPRICE (€/bottle)	0.08	0.05	0.23	-0.07	0.11
N° PRODUCERS	9	13	50	24	14

Cluster 5, comprising 14 producers (12.7% of the total), is characterised by the lowest sales value in the sample and at the same time by the highest average price, equal to 8.87 euros. In fact, 88% of their products are sold above the threshold price. In light of these characteristics, this cluster is called "*High-price oriented*". Although the average annual discount is the highest (20%), only 16% of the bottles are sold at promotional prices. Moreover, although this cluster is defined by the lowest number of Chianti DOCG labels (1.56), the annual trend of sales value is positive only for wine at base price (+15%), while the annual value of sales at promotional price records a -5%. The price shows a positive trend in the considered period.

Regarding Montepulciano d'Abruzzo DOC, during the period 2009-2017, a total of 168 different producers sold this wine in LRC. Among these, a cluster analysis was undertaken on a subset of 90 producers, excluding 48 producers classified as "*Outgoers*" and 30 as "*Incomers*".

Upon examining the dendrogram (Figure 3) and considering statistical criteria for implementing the HCA, the five-clusters solution emerged as the most suitable option. This solution showed the highest pseudo-F statistic value (28.06) compared to the other solutions, along with a better combination of the Duda-Hart index and pseudo-T value (0.705 and 12.13, respectively). Table 3 displays the average values of each variable used in the HCA implementation along with other descriptive variables.

Cluster 1, consisting of 7 producers (7.8% of the sample), stands out with the highest sales value, significantly larger than other clusters. It is therefore labelled as "*Quantity-oriented*". These producers boast the highest number of labels in the market, averaging 7.30 per year, and the highest percentage of promotional sales
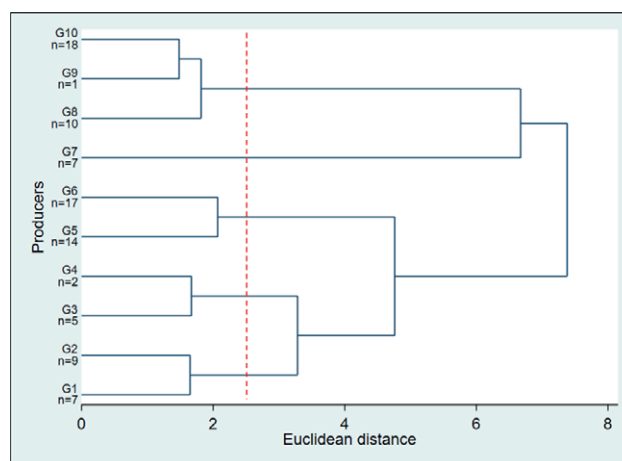
Figure 3. Hierarchical Cluster Analysis dendrogram for Montepulciano d'Abruzzo DOC. Note: Our elaboration on primary data.

(59% of the total). With a sales price of 2.64 euros, the lowest among all clusters, and the highest average annual discount (12%), no units are sold above the threshold price. However, both the value of sales at base price and promotional price exhibit negative annual performances (-3% and -6%, respectively), despite an annual increase in price.

Cluster 2 also exhibits negative trends for both sales value at base price (-6%) and promotional price (-9%), despite an increase in price. This cluster comprises 31 producers, accounting for 34.4% of the sample, with a sales value of approximately 132 thousand euros and an annual average of 2.24 labels sold. Additionally, this group of producers features the second-lowest sales price (2.90 euros per bottle) and no units sold above the threshold price. Around 47% of units are sold on promotional sales, with an average discount percentage of 11%.

Based on these characteristics, we identify this cluster as "*Low-price oriented*".

Cluster 3, encompassing 29 producers (32.2% of the sample), demonstrates the weakest performance in terms of sales value, with a decline of 7% in sales value at base price and 11% at promotional price. Hence, we label this cluster as "*Negative performers*". Each of these producers sells an average of about 1.37 different labels of Montepulciano DOC wine, with only 1% of total bottles sold above the threshold price. Despite an increasing trend, the average sales price is 3.53 euros. Around 11% of total sales come from promotions, with an average discount rate of 5%.

Cluster 4 comprises 16 producers, accounting for 17.8% of the sample. In terms of size, it boasts the second-highest average sales value, albeit significantly lower than the cluster with the highest sales ("*Quantity-oriented*") and offers a range of 4.66 different labels sold. The sales price is the second highest in the sample at 6.45 euros per bottle, with a positive annual increment. Approximately 14% of total sales are above the threshold price. Promotional sales, constituting 31% of the total units sold, feature an average discount rate of 11% and exhibit a positive annual trend (+23%), as does the sales value at base prices (+22%). These trends represent the best performance among all producers in absolute terms, leading us to label this cluster as the "*Best performers*".

Cluster 5 encompasses 7 producers, making up 7.8% of the sample, and is characterised by the lowest average sales value of Montepulciano DOC. With an average sales price of 16.12 euros, significantly higher than other clusters, 87% of units are sold above the threshold price. This cluster also demonstrates the highest annual price increase over the nine-year period. Thus, we label it as consisting of "*High-price ori-ented*" wine producers. Units sold at promotional prices amount to 11%, the lowest value among all clusters, and the sales value at promotional prices decreases by 11% over the period. The average discount rate is 9%. On average, each producer in this cluster sold 2.44 different labels of Montepulciano d'Abruzzo DOC. Despite the small sales value, the sales of wines at base prices show an annual increase of 5%.

6. DISCUSSION

The sales of 0.75-liter bottled wine in LRC from the two denominations during the period 2009-2017 exhibited divergent trends. Sales of Chianti DOCG showed a growing trend with an annual average of 4%, exceeding those of Montepulciano d'Abruzzo DOC with an annual average of 2%, thus reflecting the production volume trends of the two consortia (3% and 2%, respectively) [45].

The analysis of sales data allowed for the identification of groups of producers with homogeneous performances and sales trends within the two most marketed denominations of origin. The results of the HCA revealed the presence of five clusters of producers for both Chianti DOCG and Montepulciano d'Abruzzo DOC.

Primarily, our analysis highlights significant differences in performance between the two denominations in LCR. Among the identified clusters, 55.5% of Chianti DOCG producers, excluding one cluster, exhibit positive trend performances for sales at base price. In contrast, only two clusters of Montepulciano d'Abruzzo DOC producers show increments in sales at base price. Notably, approximately two-thirds (74.4%) of Montepulciano d'Abruzzo DOC producers, spanning three different

Table 3. Mean values of the variables describing each cluster of Montepulciano d'Abruzzo DOC.

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
	Quantity-oriented	*Low-price oriented*	*Negative performers*	*Best performers*	*High-price oriented*
SALESVALUE (€)	2,037,629.95	131,715.72	61,243.83	165,508.76	18,290.50
EAN (n°)	7.30	2.24	1.37	4.66	2.44
UNITPROMO	59%	47%	11%	31%	11%
PRICE (€/bottle)	2.64	2.90	3.53	6.45	16.12
DISC	12%	11%	5%	11%	9%
UNITOVER	0%	0%	1%	14%	87%
TRENDVALUEPROMO	-6%	-9%	-11%	23%	-11%
TRENDVALUENOPROMO	-3%	-6%	-7%	22%	5%
TRENDPRICE (€/bottle)	0.13	0.10	0.10	-0.05	0.27
N° PRODUCERS	7	31	29	16	7

clusters, experience an annual decrease in the value of all types of sales.

The comparison among producers of both denominations reveals divergent consumer purchasing behaviours: one segment bases its choices mainly on price, while another seeks higher quality standards [6,13]. The wine sales are dominated by a limited number of large companies offering several labels (EAN) at competitive prices. These are wineries belonging to the "*Quantity-oriented*" cluster, identified for both PDO wines. Additionally, the "*Promo-oriented*" cluster of Chianti DOCG, characterized by the lowest sales price, can be included in this group. Together, these clusters encompass 22 producers for Chianti DOCG and 7 for Montepulciano d'Abruzzo DOC, representing 76% and 62% of the value of sales, respectively. These producers, predominantly cooperatives or consortia of cooperatives, or companies primarily engaged in bottling, typically offer a high number of labels at lower average prices, facilitated by extensive promotional sales. However, performance differences between the two denominations are notable, with positive performance improvements observed for Chianti DOCG clusters, while Montepulciano d'Abruzzo DOC clusters show negative trends. Although these differences in performance of each denomination, these results seem to confirm that LRC is an optimal sales channel for large wine producers. These products allow LRC to adopt specific pricing policies that, also through promotions, are appreciated by consumers [6,7,18].

Additionally, clusters characterized by limited sales in quantity, but high unit value are observed for both denominations. These clusters, named "*High-price oriented*", exhibit the highest average sale prices and recorded significant sales increases, indicating growing consumer interest in quality wines in this sales channel. These results suggest an increasing preference among consumers for wines from these producers, particularly those associating product quality with higher prices [46,47]. These small producers of high-quality wines are considering the LCR as an increasingly interesting channel for selling their products when facing difficulties in other commercial outlets [48].

However, the majority of wine producers in both denominations belong to other clusters, characterized by sales values around 100,000 euros and intermediate prices. These producers differ primarily in dynamic performance over the period. The first type includes "*Best performers*", exhibiting the greatest annual increases in sales value at base price and promotion, particularly notable for Montepulciano d'Abruzzo DOC. "*Best performers*" producers of both denominations show prices above the average, 3.85 euros for Chianti DOCG and

6.45 euros for Montepulciano d'Abruzzo DOC. These producers, with prices above the average, maybe offering the most appreciated wines by consumers, although further studies are warranted for a better understanding. It is conceivable that consumers purchase wine from these producers for characteristics not considered in this study, such as brand, awards, recognisability in certain markets, or other characteristics considered signs of quality [11,17,49,50].

On the other hand, the second type consists of "*Negative performers*" producers, accounting for a substantial portion of both denominations (46% of Chianti DOCG producers and 32% of Montepulciano d'Abruzzo DOC producers). Despite similarities with the previous type, they demonstrate opposite market trends in sales. Negative sales trends are also performed by "*Low-price oriented*" producers of Montepulciano d'Abruzzo DOC, which show some common traits with the "*Negative performers*" producers. These performances may suggest several interpretations. On the one hand, these results could indicate that, despite a slightly higher price than that of "*Quantity-oriented*" producers, the limited brand strength and low appeal of "*Negative performers*" wines means that consumers are turning to bottles from other producers. Another aspect to be considered is that these producers or the distribution chains, due to their own commercial and distribution strategies, have chosen to reduce sales of these products in LRC. For example, producers may have allocated more wine to other distribution channels, such as HoReCa or export. Similarly, LRC may have reduced its supply relationships with these producers, preferring others. This reduction in supplies could therefore be translated into a lower presence on the shelves and consequently less purchases by consumers. Given the numerical relevance of these producers on the total of the respective denominations, further studies with direct investigations on these producers are needed to understand if this decline in the market could constitute a critical situation or only a dynamic towards more advantageous channels.

The analysis underscores the significant role of large producers/bottlers in dominating the market with basic wines priced below 5 euros per bottle (93% and 95%, respectively, of unit sales of Chianti DOCG and Montepulciano d'Abruzzo DOC). The decisive weight of the large producers/bottlers is therefore also evident. For both denominations, they represent almost the entire supply in LRC, although with different trends between Chianti DOCG and Montepulciano d'Abruzzo DOC. Considering that it is not easy for producers to receive a fair remuneration for denomination wines with a price below 5 euros [51,52], the decisive role of large produc-

ers/bottlers is evident. In fact, the higher volumes of wine they can produce enable them to dominate the shelves with lower prices, thanks to contained production costs resulting from the economies of scale they benefit from.

However, there is also a trend of increasing sales of the high-quality segments of the two denominations, although the data collected showed non-homogeneous trends especially for wines with intermediate prices. In general, these products are offered with average values of about 100,000 euros per producer and therefore, probably, representing only a part of the total production of each winery, they can easily be adapted to different trends in demand.

Promotional sales play a crucial role in supermarkets, especially for "*Quantity-oriented*" and "*Promo-oriented*" producers. Where it is matched by an increase in value of sales, this appears as an example of strategy to pursue. However, price promotions could have several negative effects, especially when margins fall below a certain threshold, or when annual sales fall, as is the case for "*Negative performers*". In such situations, producers could explore alternative forms of promotion with retailers besides simple price cuts [8]. By doing so, producers may have the opportunity to improve their sales without jeopardizing their profit margins.

Furthermore, the high turnover of producers in the LRC over the nine-year period is worth considering. Specifically, there were 19 "Incomers" and 83 "*Outgoers*" for Chianti DOCG, and 30 "*Incomers*" and 48 "*Outgoers*" for Montepulciano d'Abruzzo DOC. This suggests that, in the long-term, while there is space for new producers, others may exit the channel due to various strategic reasons. The reasons, which may depend on both producers' and distributors' strategies, were not investigated in this study and would be an interesting topic for future work.

7. CONCLUSIONS

This research provides an examination of the dynamics characterizing the Chianti DOCG and Montepulciano d'Abruzzo DOC wine markets within the Italian LRC spanning a nine-year timeframe (2009-2017), and consequently sheds light on the trends within this significant distribution channel for wine. The research focuses on examining the behaviour of producers within distinct clusters, elucidating their sales strategies, pricing policies, and performance trends over time.

This timeframe enabled us to analyze a substantial dataset spanning nearly a decade, providing a comprehensive understanding of trends and patterns in wine

sales in LCR over a significant period. Additionally, by selecting a wide time horizon, we aimed to capture both short-term fluctuations and long-term trends in the wine market, thereby enhancing the robustness and reliability of our analysis. Moreover, sales referring to the years before the pandemic are not influenced by the exceptional dynamics that occurred [53], such as the surge in online sales. Therefore, the study conducted analyzes the evolving situation preceding the pandemic, highlighting dynamics that may reassert themselves or be overturned after the shock that occurred in 2020 [54]. Accordingly, even though the data used for the analysis pertain to a recent past, the analysis conducted within the Italian LRC can offer valuable insights for today's PDO wine producers, highlighting the importance of strategic planning in response to evolving consumer preferences and market dynamics. Producers can use the cluster analysis results to tailor their marketing and sales strategies, focusing on price competitiveness, product quality, and promotional tactics.

The wine market in Italian LCR for both Chianti DOCG and Montepulciano d'Abruzzo DOC wines is largely dominated by a few major producers (less than 10 for each denomination), characterized by low prices and a wide range of labels, collectively representing approximately 60% of the total annual sales value. The role of these large-scale producers appears to have reached a level of saturation, while types of producers with smaller-scale operations but higher qualitative aspects exhibit growing trends. More specifically, the majority of Montepulciano d'Abruzzo DOC producers demonstrate negative performance compared to Chianti DOCG producers. The disparities between the two denominations may be attributed to their respective brand image. This suggests that, in general, additional investment in enhancing the reputation of the Montepulciano d'Abruzzo DOC may be advisable. In this regard, certain changes to production regulations were approved in 2023, including the introduction of new subzones. However, there appears to be potential for market penetration in LCR among producers offering smaller quantities of products with unique characteristics perceived as quality traits by consumers, who could also consider higher prices as quality signals. This holds particularly true for the Montepulciano d'Abruzzo DOC denomination, where producers of medium to high-priced wines experienced positive sales trends over the study period. Producers capable of meeting the minimum quantity requirements of supermarkets should consider forming partnerships, especially at the local level, with distribution chains. However, accessing the supermarket shelf may prove challenging if the route involves numerous commercial

intermediaries, adding further complexity to the process. Therefore, producers must assess the feasibility of navigating such intricate pathways to market.

The findings of this study reflect discernible trends in the demand for wine among Italian consumers, notably indicating an uptick in the consumption of quality wines in the medium to high price range, consistent with previous research [2,6,55]. It should be considered that this study specifically analyses consumption patterns for two denomination wines positioned at the top of the wine quality hierarchy. Thus, the observed trend underscores a further preference shift towards higher quality wines within the same denomination [56].

This study is a starting point for future research that can deeper investigate the characteristics of producer clusters employing successful strategies in LRC, employing more nuanced analyses and alternative methodologies. Complementing quantitative analysis with qualitative research methods, such as interviews or focus groups with producers and retailers, could offer deeper insights into the drivers of market trends, producer decision-making processes, and consumer perceptions. Future studies could address the limitations of this research and expand upon its findings by examining consumption patterns during and post-COVID-19 pandemic periods, potentially utilizing time series prediction models.

This study is not without limitations. This study is not without limitations. Firstly, the wine sales data utilized for our analysis are limited to a specific period and pertain to a recent past, predating the COVID-19 pandemic. The aim of our study is to provide an examination of long-term trends and patterns in wine sales unaffected by the extraordinary circumstances of the COVID-19 pandemic. Therefore, to offer insights into the evolving dynamics of the wine industry, future studies should include more recent data. The study focused primarily on sales performance metrics and trends, overlooking other factors that may influence producer success, such as brand reputation, marketing strategies, and production practices. Future research could adopt a more holistic approach to capture a broader range of variables. One notable aspect not accounted for is the presence of organic certification on bottles. Although organic wine accounts only for a small percentage of sales in supermarkets [15], it shows increasing purchase rates and seems to be increasingly appreciated by consumers. Furthermore, the study's focus solely on sales of 0.75-litre bottled wine from two prominent Italian denominations. For this reason, it does not detect trends in the strategies of wine producers of other denominations or of wines of lower quality and in other formats. Additionally, reliance on IRI's data means trends in sales through other channels, such as online shops or restaurants, are not addressed.

REFERENCES

[1]   Mediobanca, Indagine sul settore vinicolo. https://www.areastudimediobanca.com/it/catalogo/tipologia/indagine-sul-settore-vinicolo/, 2019 (accessed 10 March 2024).

[2]   L. Casini, V. Alampi Sottini, A. Dominici, S. Fabbrizzi, F. Gerini, C. Romano, Il Mercato del Vino nella Grande Distribuzione Organizzata in Italia. Tendenze 2009-2017 e Previsioni, Firenze University Press, Firenze, 2000. DOI 10.36253/978-88-5518-056-6

[3]   M. Gregori, L. Galletto, G. Malorgio, E. Pomarici, L. Rossetto, Il Marketing del Vino, EdiSES, Napoli, 2017.

[4]   S. Goodman, C. Habel, C. Australian off-premise: What influences their wine buying decision?, Aust. N.Z. Grapegrow. Winemak. 598 (2013) 98-100.

[5]   E. Pomarici, F. Boccia, D. Catapano, The wine distribution systems over the world: An explorative survey, New Medit 11 (2012) 23-32.

[6]   C. Contini, C. Romano, G. Scozzafava, F. Boncinelli, L. Casini, Wine consumption and sales strategies: The evolution of Mass Retail Trading in Italy, Wine Econ. Policy 4 (2015) 116-127.

[7]   M. Platania, S. Platania, G. Santisi, Entertainment marketing, experiential consumption and consumer behavior: The determinant of choice of wine in the store, Wine Econ. Policy 5 (2016) 87-95.

[8]   A.M. Corsi, The 9 (+ 1) talking points about the Australian wine retail sector, Wine Viticult. J. (2016) 59-61.

[9]   L. Rossetto, L. Galletto, Retail strategies for rosé wines in Italy: A hedonic price analysis, Int. J. Wine Bus. Res. 31 (2019) 282-302.

[10] R. Capitello, L. Agnoli, S. Charters, D. Begalli, Labelling environmental and terroir attributes: Young Italian consumers' wine preferences, J. Clean. Prod. 304 (2021) 126991.

[11] E. Pomarici, M. Lerro, P. Chrysochou, R. Vecchio, A. Krystallis, One size does (obviously not) fit all:

Using product attributes for wine market segmentation, Wine Econ. Policy 6 (2017) 98-106.

[12] G. Pappalardo, G. Chinnici, R. Selvaggi, B. Pecorino, Assessing the Effects of the environment on consumers' evaluations for wine, Wine Econ. Policy 9 (2020) 31-42.

[13] K. Toften, T. Hammervoll, Niche marketing research: Status and challenges, Mark. Intell. Plan. 31 (2013) 272-285.

[14] A. Dominici, F. Boncinelli, F., Gerini, E. Marone, Consumer preference for wine from hand-harvested grapes, Brit. Food J. 122 (2020) 2551-2567.

[15] F. Boncinelli, A. Dominici, F. Gerini, E. Marone, Insights into organic wine consumption: Behaviour, segmentation and attribute non-attendance, Agr. Food Econ. 9 (2021) 1-16.

[16] A. Galati, G. Schifani, M. Crescimanno, G. Migliore, "Natural wine" consumers and interest in label information: An analysis of willingness to pay in a new Italian wine market segment, J. Clean. Prod. 227 (2019) 405-413.

[17] L. Lockshin, W. Jarvis, F. d'Hauteville, J.P. Perrouty, Using simulations from discrete choice experiments to measure consumer sensitivity to brand, region, price, and awards in wine choice, Food Qual. Prefer. 17 (2006) 166-178.

[18] I. Bernetti, L. Casini, N. Marinelli, Wine and globalisation: Changes in the international market structure and the position of Italy, Brit. Food J. 108 (2006) 306-315.

[19] M. Hussain, S. Cholette, R.M. Castaldi, An analysis of globalization forces in the wine industry: implications and recommendations for wineries, J. Glob. Mark. 21 (2008) 33-47.

[20] C. Hawkes, Dietary implications of supermarket development: a global perspective, Dev. Policy Rev. 26(6) (2008) 657-692.

[21] R. Neuninger. The effect of concentration of retail power on the specialist knowledge of retail staff in the food and beverage sector: A case study of wine retail, in: J. Byrom, D. Medway (Eds.), Case Studies in Food Retailing and Distribution, Woodhead Publishing, Cambridge, United States, 2019, pp. 25-36.

[22] E. Pomarici, A. Corsi, S. Mazzarino, R. Sardone, The Italian wine sector: Evolution, structure, competitiveness and future challenges of an enduring leader. Ital. Econ. J. 7 (2021) 259-295.

[23] Gambero Rosso. Esselunga adotta il sommelier virtuale in Gdo. L'intervista a Daniele Colombo, 2020. https://www.gamberorosso.it/notizie/interviste/esselunga-adotta-il-sommelier-virtuale-in-gdo-lintervista-a-daniele-colombo/ (accessed 4 March 2024).

[24] G. Szolnoki, D. Hoffmann, Consumer segmentation based on usage of sales channels in the German wine market. Int. J. Wine Bus. Res. 26 (2014) 27-44.

[25] M.H. Koksal, Segmentation of wine consumers based on level of involvement: a case of Lebanon. Brit. Food J. 123 (2020) 926-942.

[26] L.D. Hollebeek, S.R. Jaeger, R.J Brodie, A. Balemi, The influence of involvement on purchase intention for new world wine, Food Qual. Prefer. 18(2007) 1033-1049.

[27] L. Casini, A. Cavicchi, A.M. Corsi, Trends in the British wine market and consumer confusion, Brit. Food J. 110 (2008) 545-558.

[28] L. Lockshin, S. Mueller, J. Louviere, L. Francis, P. Osidacz, Development of a New Method to Measure How Consumers Choose wine, Aust. NZ. Wine Ind. J. 24 (2009) 37-42

[29] C. Ritchie, The culture of wine buying in the UK off-trade. Int. J. Wine Bus. Res. 21 (2009) 194-211.

[30] C. Mazzocchi, G. Ruggeri, S. Corsi, Consumers' preferences for biodiversity in vineyards: A choice experiment on wine. Wine Econ. Policy 8 (2019) 155-164.

[31] G. Di Vita, F. Caracciolo, F. Brun, M. D'Amico. Picking out a wine: Consumer motivation behind different quality wines choice. Wine Econ. Policy 8 (2019) 16-27.

[32] C. Casalegno, C. Giachino, B. Bertoldi, A New Generation for the Wine Industry. Micro Macro Market. 28 (2019) 49-70.

[33] M.H. Koksal, Differences among baby boomers, Generation X, millennials, and Generation Z wine consumers in Lebanon: Some perspectives. Int. J. Wine Bus. Res 31 (2019) 456-472.

[34] G. Szolnoki, G. Totth, A cross-cultural comparison of wine consumption and purchasing behaviour in Germany and Hungary, Wine Econ. Policy 9 (2020) 19-29.

[35] F. Caracciolo, M. Furno, M., M. D'Amico, G. Califano, G. Di Vita, Variety seeking behavior in the wine domain: A consumers segmentation using big data, Food Qual. Prefer. 97 (2022) 104481.

[36] ISMEA, Dati di sintesi. Chianti. http://www.ismeamercati.it/flex/FixedPages/IT/VinoCertificatoScheda.php/L/IT/ID/30/REG/9/tip/0/col/0/from/-/ 2020a (accessed 30 September 2021).

[37] ISMEA, Dati di sintesi. Montepulciano. https://www.ismeamercati.it/flex/FixedPages/IT/VinoCertificatoScheda.php/L/IT/ID/300/REG/13/tip/0/col/0/from/-/ 2020b (accessed 30 January 2024).

[38] ISMEA, Scheda di settore vino. http://www.ismeamercati.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/3525#MenuV/ 2019 (accessed 30 January 2024).

[39] J.F. Hair, W.C. Black, B.J. Babin, R.E. Anderson, Multivariate Data Analysis, Pearson New International ed., Essex, Pearson Education Limited, 2014.

[40] M. Mazzocchi, Statistics for Marketing and Consumer Research, Sage Publications, London, 2008.

[41] T. Caliński, J. Harabasz, A dendrite method for cluster analysis, Commun. Stat. Theory 3 (1974) 1-27.

[42] R.O. Duda, P.E. Hart, Pattern Classification and Scene Analysis (Vol. 3), New York, Wiley, 1973.

[43] R.O. Duda, P.E. Hart, D.G. Stork, Pattern Classification, New York, John Wiley & Sons, 2012.

[44] StataCorp. Stata: Release 15. Statistical Software. College Station, StataCorp LLC., 2017.

[45] Federdoc, V.Q.P.R.D. d'Italia. https://www.federdoc.com/vqprd/ (accessed 10 May 2024).

[46] P. Balestrini, P. Gamble, Country-of-origin effects on Chinese wine consumers, Brit. Food J. 108 (2006) 396-412.

[47] S. Troiano, F. Marangon, T. Tempesta, D. Vecchiato, Organic vs local claims: Substitutes or complements for wine consumers? A marketing analysis with a discrete choice experiment. New Medit 15 (2016) 14-22.

[48] B. Richter, J. Hanf. Competitive strategies for wine cooperatives in the German wine industry. Wine Econ. Policy 9(2) (2020), 83-98.

[49] M. Hirche, S. Loose, L. Lockshin, M. Nenycz-Thiel. Distribution velocity in wine retailing. Wine Econ. Policy 12(2) (2023) 31-41.

[50] S. Sherman, T. Tuten, Message on a bottle: The wine label's influence, Int. J. Wine Bus. Res. 23 (2011) 221-234.

[51] E. Marone, M. Bertocci, F. Boncinelli, N. Marinelli. The cost of making wine: A Tuscan case study based on a full cost approach, Wine Econ. Policy 6 (2017), 88-97.

[52] L. Casini, A.M. Corsi, C. Daniele, N. Marinelli, E. Marone, G. Scozzafava, Full cost analysis and the economic sustainability of the wine sector: The case of Chianti Classico, Econ. Dirit. Agroaliment. 17 (2012), 83-103.

[53] F. Gerini, A. Dominici, L. Casini, The effects of the COVID-19 pandemic on the mass market retailing of wine in Italy, Foods 10 (2021) 2674.

[54] R. Del Rey, S. Loose. State of the international wine market in 2022: new market trends for wines require new strategies. Wine Econ. Policy 12(1) (2023) 3-18.

[55] A. Stasi, G. Nardone, R. Viscecchia, A. Seccia, Italian wine demand and differentiation effect of geographical indications, Int. J. Wine Bus. Res. 23 (2011) 49-61.

[56] G. Scozzafava, F. Gerini, A. Dominici, C. Contini, L. Casini. Reach for the stars: the impact on consumer preferences of introducing a new top-tier typology into a PDO wine. Wine econ. Policy 7(2) (2018) 140-152.