

Decision tree analysis of wine consumers' preferences: evidence from an emerging market

DT analysis
of wine
consumers'
preferences

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Received 27 November 2016
Revised 28 December 2016
Accepted 28 December 2016

Abstract

Purpose – The purpose of this paper is to analyse the interactive and individual influences of socio-demographic and behavioural-cognitive factors on the frequency and quality of wine consumption, as well as importance of the brand and advertising on selection.

Design/methodology/approach – The survey was prepared on the basis of the selected factors. The research was carried out on a sample of 207 randomly selected respondents. The analysis was done using the classification decision tree.

Findings – The results show the dominant influence of socio-demographic factors, such as region, place of living (urban-rural areas), family size, age, income and education of consumers as well as behavioural-cognitive factors, such as the price importance, place of purchase and product characteristics, in all analysed target variables. Apart from the similarities with traditional wine markets, the specificities related to an emerging market have also been determined.

Research limitations/implications – The limitations of this research concern sample size as well as the research conducted over the period of one year.

Practical implications – The practical objective of this paper is to help wine marketers to develop more effective positioning strategies for a specific emerging market.

Originality/value – This research combines critical factors based on related studies, including the antecedents and outcome variables, to develop more comprehensive models for better understanding of the wine consumers' behaviour. In major and traditional wine-making countries, the consumption of wine is fairly predictable. In emerging markets, the commercial strategies are, for the most part, based on certain specificities and are quite interesting for the surveys.

Keywords Classification, Emerging market, Decision tree, Behavioural-cognitive factors, Socio-demographic factors, Wine consumers' preferences

Paper type Research paper

1. Introduction

The world wine market is dominated by just three countries, France, Italy and Spain, which between them account for roughly half of total world production. Per capita consumption of wine in Montenegro was 0.67 litres compared to 42.51 litres in France and 33.3 litres in Italy (Wine Institute, 2015). Montenegro's market is quite specific, since it is very small and underdeveloped, but it has extraordinary climatic advantages for the production of wine and deeply rooted respect for the traditional. The Central Register of Grape Producers and Wine Makers, kept by the Ministry of Agriculture and Rural Development, include 505 registered producers. The production of wine in Montenegro has been registered in 44 wine-making companies. As far as exports are concerned, wine remains one of the country's main export products. Of the total export figures relating to agricultural products for 2014, wine represented over 14 per cent of the total. The total value of wine exported in



2013 amounted to 13.8 million €. The wine sector is recognised as a very important sector for Montenegro. Montenegro encountered significant demographic changes that also had an effect on change of consumers' behaviour. Urban population accounts for 63 per cent of the general population of Montenegro (Jovanović *et al.*, 2016). In lateral perspective, all kinds of food in the proportion of total expenditures have changed over time. In the reporting period from 2005 to 2013, the most increased consumption is that of wine, i.e. 40 per cent (Jovanovic, 2016). Montenegro belongs to the group of countries with low GDP per capita (USD7,276.10, www.tradingeconomics.com). For that reason, economic and social factors determine consumer behaviour at the wine market to a significant extent.

Market strategies creation in such specific conditions depends significantly on the consumer preferences. The objective of this study is to establish which factors influence the wine consumer preferences in specific emerging market conditions.

Numerous authors have engaged over the past decade in research of wine consumer preferences at the local or national markets (Barber *et al.*, 2006; Bernabéu *et al.*, 2012; Casini *et al.*, 2009; Hu *et al.*, 2008; Lockshin, and Corsi, 2012).

Data obtained by surveying Montenegrin wine consumers are used for analysis in this paper. The analysis was done using the classification decision tree (DT). As far as the authors are aware, the DT method has not been used for this issue before. The main advantage of this method, compared to other statistical methods, is that it provides easier overview of the structure of interdependence of the data in the form of the tree, i.e., the derived classification rules.

The rest of the paper has been organised as follows. Section 2 provides an overview of the existing reference papers. Section 3 includes survey methodology, research questions, selection of factors, i.e., the variables for analysis, and DT method. Section 4 presents the results obtained, while Section 5 contains discussion of the results obtained. The final part, Section 6, presents the conclusions. References are given at the end of the paper.

2. Reference papers

Reference papers on wine consumers' behaviour comprise numerous studies, the objective of which is to explain which of the attributes influence wine selection, as well as in our work.

Researchers found out that attributes with the highest influence are label attractiveness, brand, region of origin of wine, price and advertising. However, influence of these attributes depends greatly on the experience and involvement of consumers. In relation to the importance of front labels, consumers shop with their eyes (Barber *et al.*, 2006; Orth and Malkewitz, 2008). Bruwer and Johnson (2010) showed that the addition of regional information on a wine brand increased consumer confidence in the quality of the product. According to Perrouy *et al.* (2006), during their learning process, consumers accord a decreasing degree of value to regions of origin, brands or prices alone and an increasing degree to combinations between these signals. The biggest difference in reaction to price is between low- and high-involvement consumers. The high-involvement consumers are more likely to buy wines at the higher price points (Lockshin *et al.*, 2006). Some studies showed that market supply can influence wine selection. Thus, Van Herpen *et al.* (2014) analysed when scarcity of a specific wine increases consumer choice for this wine. Following the example of above mentioned studies, this study adapted the attributes of importance for the wine selection.

Vast majority of these studies focus on the general purchase behaviour, with only few taking into consideration the frequency of consumption and place where consumers buy the wine. Casini *et al.* (2009) concluded that low- and high-frequency consumers show significantly different behaviours as well as retail sector and on-premise sector (restaurants and cafes) consumers. Martínez *et al.* (2006) noted that the price attribute also has a different valuation depending on the purchase place, the relative importance of which is greater in

restaurants than in shops. Regarding the frequency of consumption, they highlight that habitual consumers give a lower importance to designation of origin and price, which are very important variables in the decision made by those consumers with a low knowledge about the product. For that reason, this study included also the frequency of consumption and purchase place into the analysis.

A large number of papers analyse also the influence of socio-demographic factors on wine consumers' selection. Thus, Barber *et al.* (2006) researched the effect of gender, age and income on wine selection. They established that females and respondents between 31 and 40 years of age were more concerned about making a wine-buying decision, as well as that lower income consumers select wine less carefully than those with higher income. Furthermore, Bruwer *et al.* (2012) concluded that specific differences exist in the wine consumption behaviour and wine-type preferences of males and females and between generational cohorts, specifically older consumers. Wolf *et al.* (2005) point out that younger consumers prefer domestic and less expensive wines, while older prefer brand and quality. They also point out that older consumers focussed more on the health benefits of wine, while younger were more focussed on the social outcomes. Casini *et al.* (2009) showed that differences in income among Italian consumers do not have a strong effect on market segmentation, while the consumers' age and region of residence have a significant effect on segmentation. According to Lockshin and Corsi (2012), more recent studies show that frequent wine consumers have income above average. Skuras and Vakrou (2002) studied the readiness of consumers to pay for labelled (branded) wines. They established that among the factors such as age, education, marital status, family size, urban-rural place of living and income, education level has the greatest effect on the decision. According to Skuras and Dimara (2004), the region of wine origin has proved important in influencing the mentality of urban consumers. They also found out that family size and rural origin of the consumers negatively affect total expenditure on regionally denominated wine. Di Vita *et al.* (2014) have shown that high-quality wines (HQW) are consumed by consumers with a higher education level and higher income. They also established that consumers aged 36-50 years purchase wine in large retail stores and that when selecting wine they find price very important. In line with those results, the analysis conducted in this paper included also the adapted socio-demographic factors mentioned above.

Lockshin and Corsi (2012) pointed that consumers in emerging markets are likely to be new and mainly uninformed consumers. We really do not know if emerging markets follow the same patterns as developed markets in their reaction to various marketing activities. Most of previous studies concern large and developed markets, while studies on small regional developing markets are limited. Thus, Di Vita *et al.* (2015), analysing the small and emerging wine market in Sicily, found out that the region of origin is the main determinant in the wine price mechanisms, while importance of brand is not significant. Furthermore, Caracciolo *et al.* (2015) highlighted consumer income, habit of purchasing wine in wine shops and consumption of wine in public places as the key determinants in consumption of Sicilian wine. Influence of traditional and cultural factors is typical of developing markets. Thus, for example, Hu *et al.* (2008) revealed some salient characteristics of Chinese consumers' buying behaviour associated with Chinese culture. When the Chinese are evaluating wine for gift giving and consuming wine in public, they tend to attach more importance to country of origin and quality than to other variables. Also, Skuras and Dimara (2004) underline that a consumer of regionally denominated wine values the region's cultural heritage and tradition as an important characteristic when deciding to buy and consume wine. One of problems faced by developing wine industry is the absence of correlation between price and quality. One problem is certainly due to the ineffective marketing strategies that focus too much on the price variable, and stimulate producers to underpriced HQW, which would probably sell more if priced appropriately (Panzone, 2011).

The conclusion is that behaviour patterns can vary significantly in specific small and emerging market conditions, particularly under the conditions of economic underdevelopment and specific cultural and traditional setting, which are analysed in this paper.

While most of previous research works used the statistical methods for hypothesis testing, this study used the data mining DT method. Due to its robustness in terms of discrete variables and variable distribution, the DT and other data mining methods are widely used for business data analysis (Kaščelan *et al.*, 2016; Stefanovic, 2015).

3. Research methodology

3.1 Research questions and selection of factors

In accordance with the set objective of the research, the research questions used in this paper are as follows:

RQ1. What factors influence the wine consumption frequency?

RQ2. What factors influence the consumption of quality wines (QW)?

RQ3. What factors influence the importance of wine brand for consumers?

To answer the research questions, we chose the factors that influence the consumers' preferences on the basis of overview of the reference papers (Section 2), but also on the basis of specific characteristics of Montenegrin market. The factors are given in Table I.

3.2 Description of the survey and variables for analysis

The survey was prepared on the basis of the selected factors. The research was carried out on a sample of 207 randomly selected respondents in seven cities in Montenegro (Podgorica, Danilovgrad, Nikšić, Cetinje, Kotor, Budva and Bar) in different places (retailers, cafés, restaurants, etc.). The distribution of respondents is presented in Table I. Of the total number of respondents, 187 valid responses were given.

Based on selected factors and the responses given in the survey, 21 discrete variables were defined for analysis. Table I provides an overview of final variables, their role in analysis (target, independent), the type (nominal), their statistics and their distribution.

3.3 DT method

Data mining method CART DT (Breiman *et al.*, 1984; Quinlan, 1993) was used for analysis of the data collected and for generation of the model that can give an answer to the research questions.

Traditional statistical methods are mainly dealing with numerical (continuous) data for which strong assumptions need to be made as regards to their distribution and relationship between variables. On the other side, DT method can be applied on heterogeneous (discrete and continuous) data, either without or with just a few assumptions (De Ona, 2012). In this analysis, the independent and target variables have discrete values (Table I). Since the DT method was selected for data analysis.

Data mining methods have been used previously in studies on food consumption (Vindigni *et al.*, 2002). With regards to the wine sector, the methods were also used in the studies on the chemical parameters involved in the process of wine production (Ribeiro *et al.*, 2009; Cortez *et al.*, 2009).

4. Results

In order to provide answers to research questions, classification DTs were generated using the CART method. Table II gives an overview of importance of individual factors. The factors for which importance is not given do not have an effect.

Role	Name ^a	Type	Statistics	Range
Target	ConsumFreq	Nominal	Mode = Month-week (117), least = Daily (70)	Daily (70), Month-Week (117)
Target	Quality	Nominal	Mode = QW (93), least = NoAnsw (1)	QW (93), HQW (73), NoAnsw (1), TW (20)
Target	Brand Importance	Nominal	Mode = ViM (91), least = NiM (10)	ViM (91), NiM (10), SwI (86)
Independent	Advertising Imp	Nominal	Mode = No (103), least = Yes (84)	No (103), Yes (84)
Independent	Gen	Nominal	Mode = M (108), least = F(79)	M (108), F (79)
Independent	Age	Nominal	Mode = 18-25 (66), least = 36-45(25)	36-45 (25), 18-25 (66), 46-55 (31), 26-35 (37), > 55 (28)
Independent	FamStat	Nominal	Mode = Nmar (96), least = Mar (91)	Mar (91), Nmar (96)
Independent	Education	Nominal	Mode = S (89), least = P(4)	P (4), S (89), H (38), F (56)
Independent	Living	Nominal	Mode = Cy (109), least = Vg (25)	Vg (25), Cy (109), Sb (53)
Independent	Family	Nominal	Mode = 4.0 (64), least = 1.0 (11)	4.0 (64), > 5 (15), 3.0 (42), 5.0 (43), 2.0 (12), 1.0 (11)
Independent	Income	Nominal	Mode = €401-600 (66), least ≥ €1,000 (8)	€201-400 (42), €401-600 (66), €601-800 (31), > €1,000 (8), €801-1,000 (19)
Independent	Domestic	Nominal	Mode = Dmt (111), least = Frg (76)	Dmt (111), Frg (76)
Independent	TrdFactor	Nominal	Mode = Q (104), least = Pack (1)	Prc (36), Q (104), Pdr (25), PackS (3), Bnd (18), Pack (1)
Independent	Size	Nominal	Mode = 0,75 l (91), least = 3,00 l (3)	1,00 l (63), 0,75 l (91), 0,19 l (22), 0,50 l (8), 3,00 l (3)
Independent	PurchasePlace	Nominal	Mode = Spm (70), least = Cf (2)	Spm (70), Wsh (25), Cf (12), Ddr (31), Dfp (11), Hpm (38)
Independent	ConsumingPlace	Nominal	Mode = Hm (127), least = No Answer (1)	Hm (127), Rt (56), Cf (3), No Answer (1)
Independent	PriceImportance	Nominal	Mode = HtR (100), least = Idk (28)	TnR (59), Idk (28), HtR (100)
Independent	SupplySatisfaction	Nominal	Mode = SaT (84), least = DiS (11)	SaT (84), SoS (44), CoS (33), DiS (11), MoD (15)
Independent	AnotherWine	Nominal	Mode = No (97), least = Yes (90)	No (97), Yes (90)
Independent	Location	Nominal	Mode = PG (102), least = No Answer (1)	DG (20), PG (102), NK (38), BD (4), No Answer (1), BR (11), KL (4), KO (5)

Notes: ^aSocio-demographic factors: Location – city of residence; Living – place of living, i.e. city, suburb or village; Gen – gender; Age – age of consumer; Education – education of consumer; FamStat – family status, i.e. married or single; Family – family size, Income – income of consumer. Behavioural-cognitive factors: Domestic – wine origin; Brand Importance – influence of the brand; AdvertisingImp – influence of advertising; Price – influence of the price; Quality – quality of wine; ConsumFreq – consumption frequency; PurchasePlace – place of purchase; ConsumingPlace – place of consumption; SupplySatisfaction – satisfaction with supply; Size – size of the packaging; AnotherWine – readiness to select some other wine in case of lack of the preferred wine; TrdFactor – the decisive factor in trade in terms of product characteristics (price, producer, package, brand, quality)

Table I.
Variables for analysis
generated based on
the survey results

Figures 1-3 present the DT models for factors that influence wine consumption frequency, quality of wine and the importance of wine brand. The classification accuracy for these DT models ranges from 67 to 76 per cent, meaning that the models classified accurately about 70 per cent of data and thus may be considered valid for analysis and interpretation of relationships among variables.

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		ConsumFreq	Quality	BrandImportance
Table II. Importance factors for wine consumer preferences	AdvertisingImp			
	Age	25	1	
	AnotherWine			
	BrandImportance	4	3	
	ConsumFreq			
	ConsumingPlace	1	3	2
	Domestic		7	
	Education	13	8	19
	Family		11	17
	FamStat	4		
	Gen	5		
	Income	9	10	6
	Living	16		4
	Location	2	14	2
	PriceImportance		14	
	PurchasePlace	16	14	4
	Quality	1		3
	Size		2	
	SupplySatisfaction		4	25
	TrdFactor	5	8	15

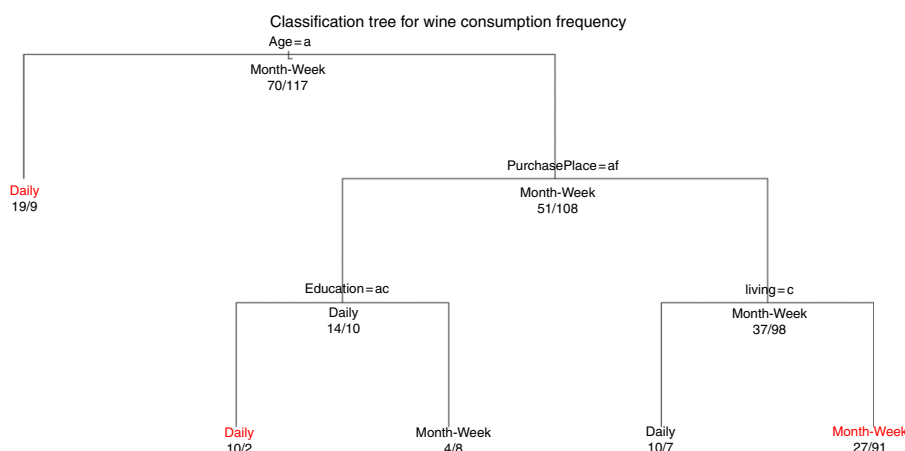
5. Discussion

The analysis of important rules derived from the DT models from Figures 1-3 can determine the combined effect of factors regarding the research questions.

Thus, according to Figure 1, the daily purchase frequency is found among older consumers (age > 55) (in difference to Bruwer and Johnson (2010) who found a negative effect of age in an American study) or those younger than 55 years who order wine in cafés or wine shops, with university degree or with primary education only. Older consumers consume wine on daily basis, which is mainly the result of the years' long habit of consuming wine with a meal, particularly since wine has certain medicinal traits (Wolf *et al.*, 2005). Consumers with university education who, as a rule, have higher income (in line with Caracciolo *et al.*, 2015 and contrary to Bruwer and Johnson, 2010 who found a negative correlation between income and wine consumption frequency) often consume wine in cafés or wine shops, according to their lifestyle and as a matter of prestige (wine consumption in public places, in line with the findings of Caracciolo *et al.*, 2015), while consumers with low education and incomes consume wine on daily basis in bars mainly as a result of the developed habits, regardless of the quality (Barber *et al.*, 2006). Consumers below 55 years, who purchase wine directly from producers, discount stores, supermarket or hypermarket (Di Vita *et al.*, 2014) and live in the city or in suburbs, consume wine on monthly or weekly basis, during special opportunities, family patron days, celebrations, etc. which, as a rule, are organised over the weekends and on no work days.

The results obtained suggest that popular cafés and wine shops may be very profitable sales channels for prestigious wines, while standard cafés and bars can be profitable sales channels for lower QW. Also, very profitable market segments suitable for direct marketing that stand out are older consumers, with emphasis laid on health attributes of wine, as well as higher income and higher education buyers.

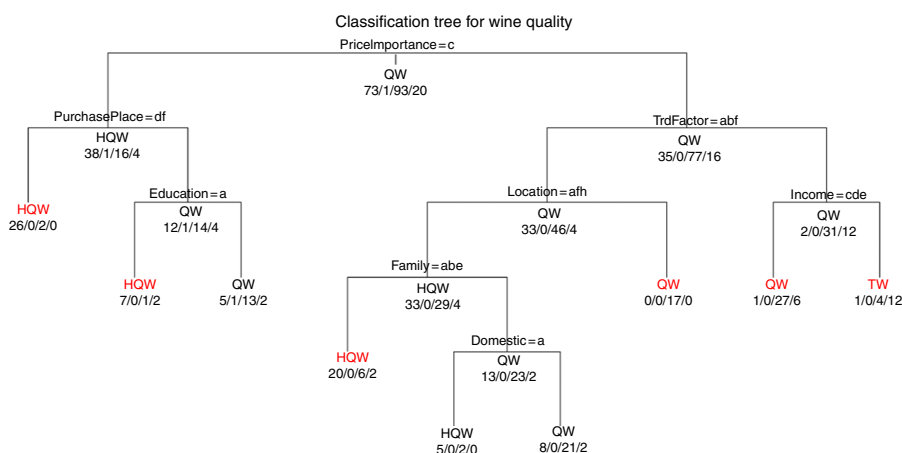
On the basis of the DT model in Figure 2, HQW are purchased by two consumer groups. The first group are consumers for whom price bears no importance and who buy wine in hypermarkets or wine shops and have university degree, in line with the findings of Di Vita *et al.* (2014) and Casini *et al.* (2009). In the second group, these wines are bought by



Notes: Age: (a) >55 years, (b) 18-25 years, (c) 26-35 years, (d) 36-45 years and (e) 46-55 years; PurchasePlace: (a) café, (b) producer, (c) discount, (d) hypermarket, (e) supermarket and (f) wine shop; Education: (a) faculty, (b) high, (c) primary and (d) secondary; Living: (a) city, (b) suburb and (c) village; and Consumption Freq: daily, month-week: monthly or weekly. Analysis of the DT model shows that the root variable (Age) divides the data to a left sub-tree, that concerns elderly consumers (>55) and a right sub-tree, that concerns other consumers. Reading the rules from the root towards the leaves establishes the ways how several factors considered interaction in order to influence the wine consumption frequency. Thus, for example, reading the rule that corresponds to the second leaf, from left to the right (consumption frequency – Daily), it can be concluded that consumers below 55 years, who order wine in a café or a wine shop, with university education or elementary school, consume wine on a daily basis. It is useful to take into account the most important leaves (that have the highest confidence and support or lift ratio) for daily consumption frequency and most important leaves for monthly consumption frequency (marked in red). Confidence is the number of accurately classified data in a leaf compared to the total number of data in the leaf, while support is the number of data in a leaf compared to the number of all leaves. Lift ratio is an important measure for significance of the rule as it represents the confidence of the rule compared to the percentage of occurrence of the class in the original data set

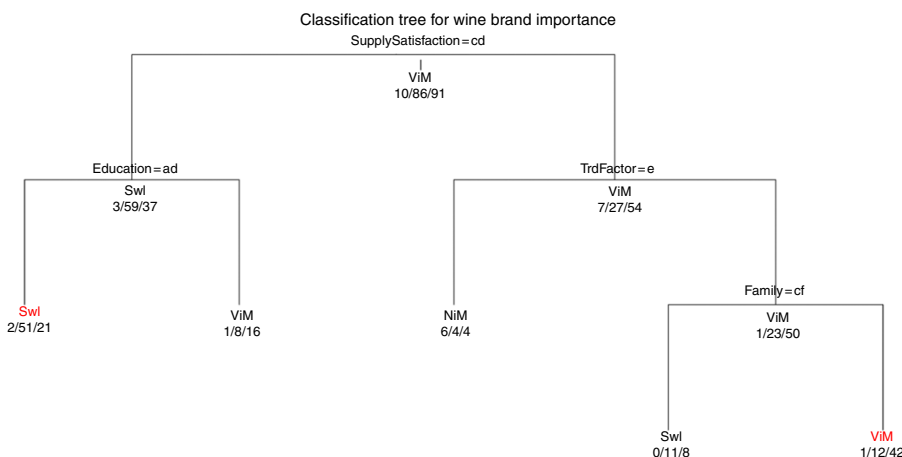
Figure 1.
DT model for
classification of
consumers based on
the wine consumption
frequency

consumers who find the price important but also the characteristics of the product, such as brand and packaging, in line with the findings of Perrouty *et al.* (2006); these consumers come from larger cities, and as far as family size is concerned, they are either single or have large families (> 5). (Skuras and Dimara (2004), too, established among Greek consumers a positive effect of single marital status and family size on preference for HQW). While the first group is buying wine mainly for their own needs, the second group of consumers is buying wine partly for their own needs and partly for their family patron day and other religious, state and family holidays or as a gift, in line with Montenegrin tradition. Thus, the importance of high quality is highlighted (Hu *et al.*, 2008). The highest consumption of HQW was registered in the largest cities, with urban population with higher income and higher education level (Skuras and Dimara, 2004; Di Vita *et al.*, 2014). Somewhat middle-QW are bought by middle-income consumers who find price and producer (region of origin) important for their decision (Barber *et al.*, 2006). Consumers who find price, brand, packaging and quality important and who live in smaller cities prefer QW too. If consumers of these wines come from larger cities, family size is important in addition to the price, brand, packaging and quality. They usually have smaller families (from two to



Notes: PriceImportance: (a) Yes, (b) No Answer, (c) No; PurchasePlace: (a) Café; (b) Producer, (c) Discount, (d) Hypermarket, (e) Supermarket, (f) Wine Shop; TrdFact: (a) Brand, (b) Pack, (c) Pack Size, (d) Producer, (e) Price, (f) Quality; Education: (a) Faculty, (b) High, (c) Primary, (d) Secondary; Location: (a) BD, (b) BR, (c) DG, (d) KL, (e) KO, (f) NK, (g) No Answer (h) PG; Income: (a) <200, (b) >1,000, (c) 201-400, (d) 401-600, (e) 601-800, (f) 801-1,000; Family: (a) >5, (b) 1, (c) 2, (d) 3, (e) 4, (f) 5; Domestic: (a) Both, (b) Domestic, (c) Foreign, (d) No answer. Wine quality: QW, quality wine; HQW, high-quality wine, TW, table wine

Figure 2.
DT model for
classification of
consumers based on
the wine quality



Notes: SupplySatisfaction: (a) Completely satisfied, (b) Dissatisfied, (c) Mostly dissatisfied, (d) Satisfied, (e) Somewhat satisfied; Education: (a) Faculty, (b) High, (c) Primary, (d) Secondary; TrdFact: (a) Brand, (b) Pack, (c) Pack Size, (d) Producer, (e) Price, (f) Quality; Family: (a) >5, (b) 1, (c) 2, (d) 3, (e) 4, (f) 5; Brand Importance: ViM, Very important; NiM, Not important, Swi, Somewhat important

Figure 3.
DT model for
classification of
consumers based on
the wine brand
importance

four members) and use exclusively either domestic or foreign wines. Table wines (TW) are consumed by consumers who find the price important, the packaging size and producer and who have lower income (< EUR200) (Barber *et al.*, 2006). Since these are low purchasing power consumers, it is logical that the influence of income and price dominates the

procedure of making the decision on purchasing a product such as wine. Consequently, in the family budget structure, wine comes among lowest priority products, which is in line with the specific character of the Montenegrin food and beverages market.

The importance of brand and region of origin was established for HQW and QW, while selection of TW is influenced only by the region of origin, but not by the brand. Caracciolo *et al.* (2016) established for Italian market that brand increases the importance of HQW and TW, while it has no influence for QW. The authors also established that indicating the region of origin increases, in particular, the importance of HQW. However, for regional Sicilian emerging market, Di Vita *et al.* (2015) established that the region of origin is the key determinant for price setting, with brand having no statistically significant influence.

Recommendations to producers that may be a key to success on the Montenegrin market result from the analysis of quality-related wine consumption. For HQW and QW producers, indication of brand and region of origin may be a very efficient marketing tool. The recommendation for TW producers is to make sure they indicate the region of origin which, in view of Montenegrin consumers, is a decisive factor in wine selection. Since TW consumers identified package size as an important factor, the producers of these wines should plan cost-effective package with certain discounts that are very important for this buyer segment. Urban consumers with high education and high income and consumers from large urban areas who are single or have big traditional families are identified as an important market segment for HQW. For medium QW marketing, favourable market segment comprises middle-income buyers with smaller families. Finally, wine shops and hypermarkets are identified as important sales channels for HQW.

The factors with the highest influence on the wine brand consumed by Montenegrin consumers are market supply (25 per cent), education (19 per cent), family size (17 per cent) and product characteristics (15 per cent) (Table II, column 3). Wine buying is significantly related to the level of consumers' satisfaction with the market supply. Thus, for example, in case of scarcity of wine they usually buy, out of 207 respondents, 82 (39.6 per cent) said they do not continue with the purchase and give up buying wine at that moment, as a result of disappointment and dissatisfaction with the fact that their preferred wine is not available. On the other hand, the absence of a brand on a market may also mean that it is in high demand and thus has an effect on the higher significance of that particular brand (Van Herpen *et al.*, 2014). It is indisputable that advanced education increases also the importance and significance of brand as a synonym of quality, reliability, security and safety of the product, in line with findings of Skuras and Vakrou (2002). According to Figure 3, the family size and product traits (producer and package, but not the price) are also important factors, all the more because single consumers or larger families stand out as the consumers who find the brand important. The former as a result of freedom in creating their budget structure and absence of the need to make any compromise and restructuring towards the product (Skuras and Dimara, 2004 have also established a positive correlation between the single marital status and probability of consuming branded and regionally labelled wine), while the latter has to take proper care of numerous limitation factors typical for larger families but also of traditional and culture logical habits that prevail in this case and impose the importance of the brand (in line with findings of Skuras and Dimara, 2004). Consumers who find brand important when selecting wine also consider important the producer and hence the region of origin (producer is in most cases related to the region of origin of the wine), which confirms the findings of previous studies (Di Vita *et al.* 2015; Bruwer and Johnson, 2010; Skuras and Dimara, 2004; Menapace and Moschini, 2012) also for the Montenegrin market.

The present findings have implications for the marketing of wines. The empty shelves tactic may have a positive effect on the sale of branded wine, which is very important for wine shops whose clients, as a rule, are demanding customers and wine connoisseurs.

Branded wine producers should also be aware that consumers relate certain regions to certain products and that regional and local culture, history and tradition influence the reputation of their product. Therefore, wine branding and labelling strategy should include regional and traditional-cultural peculiarities. Valorisation of local potential in this way can significantly influence the rural regional development.

As far as individual influences are concerned, according to Table II, among socio-demographic factors, age, region, family size, place of living (urban-rural areas), income and education have the highest influence on wine consumers. Behavioural and cognitive factors having the highest influence are the price importance, place of purchase and product characteristics (brand, producer and packing).

Apart from the similarities with the findings of research works done so far concerning the traditional wine markets, significant differences specific for a small emerging market, such as Montenegrin, have been established. Interestingly enough, gender and domestic-foreign origin of wine have a rather small effect on consumer behaviour; although in a large number of papers referenced above these factors have been recognised as the significant choice drivers. The reason for that is that consumers in emerging markets are likely to be new and mainly uninformed consumers, regardless of gender. Furthermore, frequent wine consumers are not high-involvement consumers and habitual consumers (Lockshin *et al.*, 2006; Martínez *et al.*, 2006), but rather those who consume wine in cafés and restaurants as a matter of prestige or as a result of bad alcohol consumption habits. In difference to developed market, where influence of family size has not been established (Skuras and Vakrou, 2002), this factor has a significant effect for Montenegrin consumers, for economic, cultural and traditional reasons.

Although price is an important factor for developed markets, its significance in a developing market is of a different character, namely, in the Montenegro's market, price is one of the decisive factors primarily due to the poor standard of living of consumers. This is supported further with the findings that income has a significant effect on consumer behaviour in Montenegro, unlike some other traditional markets, such as Italian (Casini *et al.*, 2009). Nevertheless, marketing strategies should not be focussed on price only, underestimating the quality of wine as a result of poor standard of living of consumers, particularly in exports of the product. The producers have to focus on utilising regional and traditional-cultural peculiarities proved to be highly regarded by Montenegrin consumers and that make an integral part of their perception of a brand.

6. Conclusion

Market strategies creation in specific conditions depends significantly on the consumers' preferences. The objective of this study was to determine which factors influence the wine consumer preferences in conditions of Montenegro's developing market, with all its specific characteristics, and how. Thus, interactive and individual influences of demographic, social and behavioural factors on frequency and quality of wine consumption, as well as on importance of the brand during the process of wine purchase, have been analysed by this paper.

In order to analyse the consumers' preferences, a combination of a survey and the classification DT method was used for results quantification. DT models classified accurately more than 70 per cent of data, so they can be considered valid for analysis and interpretation of relations between the variables.

Of all the factors analysed in relation to the consumers' behaviour and preference, the dominant factors identified are demographic factors – age, region, family size and place of living, social factors – education and income, and behavioural factors – price importance, place of purchase and product characteristics. Apart from the similarities in consumer behaviour with those found at developed markets, differences were established as well,

resulting mainly from the lower standard of living and underdeveloped market but also from the cultural specificities and traditional mentality.

From a scientific point of view, the main contribution of this work is the development of more comprehensive models for better understanding of wine consumer behaviour on a small and emerging market. The previously used statistical methods imply previous definition of hypotheses on relationships between dependent variable and independent variables. DT method does not require pre-defined hypotheses and is able to provide an insight into additional causative relations that might not be included in the hypotheses set. Also, the objective was revealing and a simple interpretation of individual and combined effect of factors, which complements the related studies that mainly identify individual effects. Another important contribution is the analysis of a small emerging market, where consumer behaviour is much more unpredictable and where much fewer research works have been conducted than it is the case with large and developed markets.

Our findings also confirm the social and practical implications. Namely, DT classification was used to segment the market by wine quality and consumption frequency, with high accuracy. The segments identified were clearly described with appropriate DT classification rules, thus making the development of direct marketing strategies for these segments easier for the wine producers. Highly profitable sales channels were identified as well as sales channels for wines of different quality. Winning marketing strategies for regional producers were identified with regard to wine branding and labelling, thus creating the opportunities for regional and rural development. This research can thus significantly assist wine marketers to develop more effective promotional decisions and positioning strategies.

Limitations of these researches concern sample size (however, for Montenegrin circumstances, this can be considered significant) as well as research conducted over the period of one year. Future research activities should focus on a follow-up research in order to provide a dynamical aspect of analysis of the target variables observed.

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Further reading

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