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Title

WINE CONSUMER PROFILES FROM PRODUCING AND IMPORTING COUNTRIES IN EUROPE ARE DIFFERENT

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Keywords

wine, profile, demographics, consumption, Europe

Research Question

This research analyzes how the European wine demand is impacted by the variables that define the environment of wine consumption, and the characteristics of the wine consumer.

Methods

This research presents a historical, empirical, and econometric description of European wine consumer's demographic and socioeconomic characteristics within the years 1990 and 2014.

Results

This research concludes that net importers wine consuming countries in Europe have wine consumers that are demographically different to the traditional European wine consumer's profile from the producing wine countries.

Abstract

This research defines the demographic and socio-economic profile of wine consumers over the past twenty-five years in five European countries, three traditional producing countries (France, Italy, and Spain) and two net importers (Germany, and United Kingdom). The exponential fall in the per capita consumption of wine in the producing countries and the positive increments in the per capita consumption of wine in the net importing countries (Dal Bianco et al., 2013) show a particular topic of research interest, where determining their profiles, and how close they are, is of relevant importance.

The study of the aggregate consumption of wine is one of the great questions that have arisen with interest and concern in the most recent decades in the scientific, as well as political, economic and social arenas related to this very European product. Knowing the conditions that have affected wine consumption of each typology of countries and their consumer's profile are fundamental to advance in the knowledge of this unique past experience, as well

as to know the future prospects that are opened on the subject and in this sector so important for the agri-food and distribution industries.

The objective of this research is to analyze how the European wine demand is impacted by the variables that define, on one hand, the environment of wine consumption and, on the other hand, the characteristics of the wine consumer. The dynamics followed by two large groups of European wine consumers, three traditional producing countries (France, Italy, and Spain) and two net importers (Germany, and United Kingdom), are compared. Similar to what Villanueva et al. (2015) studied for the American wine consumer of the last decades of the 20th century and the beginning of this 21st century, this article presents a historical, empirical, and econometric description of European wine consumer's demographic and socioeconomic characteristics within the years 1990 and 2014. Data analyzed and correlated correspond to official European Census variables (age, gender, household income, and level of education), and European wine industry variables (wine consumption in volume and per capita, and production). In this article, wine has been treated as a homogeneous good, while acknowledging that there are several wine categories; the data set on "wine consumption in volume" by Euromonitor (2015) does not discriminate by type of wine, it only accounts the total liters of wine consumed during a year.

For this empirical study, a panel of variables referring to the consumption of wine from five European countries, France, Italy, Spain, the United Kingdom and Germany has been designed. These countries, traditionally consumers, account for 78% of the E.U. consumption of wine and 39% of the world consumption of wine (OIV, 2015). The period 1990-2014 is studied, forming a balanced panel.

The Environment Variables selected, WPX (Wine Price), PROD (Wine Production) and CAP (Agricultural State Policies), influence wine consumers. The variable Wine Price is used in the studies of Salvador (2016), Camillo (2012), Gallet (2007), and Lockshin et al. (2006), among others, to conclude that prices are a significantly impactful variable on wine consumption. The variable Wine Production is introduced because, as Briz i Godino (2002) points out, "we cannot understand any production without consumption and vice versa, if the aim is to recognize the economic dynamics". Finally, the variable Agricultural State Policies is important and representative of the wine consumption environment since the wine sector has historically been regulated in Europe (Castillo et al., 2014). In this sense, authors like Castillo and Rodriguez (2009) mention the influence that Agriculture State Policies have into the consumption of wine.

The Consumer Variables, intrinsic to the individual, are income level, age, sex, level of education, marital status, and beer consumption. These variables identify and describe the consumer profile and its evolution. Authors such as Bardaji (1993) conclude that significant variables in wine consumption were income, a married status, and higher education studies. In terms of wine consumption demographic patterns in the US, authors like Martín de Mulas (2009) and Thach (2014) coincide that at the beginning of this century is when, in addition to a married status, feminine gender and a lower age, closer to 21 (the new generations) identify and describe the American consumer. Other authors such as Hussain et al (2006) agree that the wine consumption growth in the US has been significant because of the major consumption of the younger population. Gallego (2014) points out that large consumers continue to have the highest family income. Camillo (2012) indicates that level of studies is an important factor influencing the buying and consumption behavior of Chinese wine consumers.

Finally, the Contribution Variables have been introduced because, as Lockshin et al (2006) points out, "the incorporation of geographic factors together with the brand and price allow us to measure the sensitivity of the wine consumer". The incorporation of these dichotomous variables allows the modeling of characteristics of the transverse units that do not change over time but which do affect the result of our interest (Aparicio and Márquez, 2005).

Although wine consumption has quantitatively converged towards an unified and close value for most of the European countries (Smith and Mitry 2012), the research presents that net importers wine consuming countries in Europe, in this case Germany and the United Kingdom, have wine consumers that are demographically different compared to the traditional European wine consumer's profile from the producing wine countries, in this case France, Italy, and Spain. There are still major differences in the wine consumer profiles of both types of countries. Through an econometric analysis of different demographic, production, consumption, and environmental variables, the article shows that wine consumers in Germany and the United Kingdom have different profiles to those of France, Italy, and Spain. The empirical description of consumers from Germany and the United Kingdom, alike to those of the United States, presents their wine consumer profile with higher income, married, and higher level of education than those consumers of the European wine producers' profile, and the general wine European profile. The designed model has been able to detect certain novelties not previously captured in the literature, which can

give clues and signs in order to pursue further qualitative analysis of wine consumers and wine consumption dynamics and its sustainability in traditional consumer countries and new consumer countries.

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1 **WINE CONSUMER PROFILES FROM PRODUCING AND IMPORTING**
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SUMMARY

This article defines the demographic and socio-economic profile of wine consumers in Europe over the past twenty-five years. It is showed that, although there could be a convergence in wine consumption in Europe, the consumer profiles of the main European wine consumer countries still differ. The article concludes that net importers wine consuming countries in Europe, in this case Germany and the United Kingdom, have wine consumers that are demographically different to the traditional European wine consumer's profile from the producing wine countries, in this case France, Italy, and Spain.

Key Words: wine, profile, demographics, consumption, Europe.

INTRODUCTION

This article defines the demographic and socio-economic profile of wine consumers over the past twenty-five years in five European countries, three traditional producing countries (France, Italy, and Spain) and two net importers (Germany, and United Kingdom). The exponential fall in the per capita consumption of wine in the producing countries and the positive increments in the per capita consumption of wine in the net importing countries (Dal Bianco *et al.*, 2013) show a particular topic of research interest, where determining their profiles, and how close they are, is of relevant importance.

The study of the aggregate consumption of wine is one of the great questions that have arisen with interest and concern in the most recent decades in the scientific, as well as political, economic and social arenas related to this very European product. Knowing the conditions that have affected wine consumption of each typology of countries and their consumer's profile are fundamental to advance in the knowledge of this unique past experience, as well as to know the future prospects that are opened on the subject and in this sector so important for the agri-food and distribution industries.

The objective of this research is to analyze how the European wine demand is impacted by the variables that define, on one hand, the environment of wine consumption and, on the other hand, the characteristics of the wine consumer. The dynamics followed by two large groups of European wine consumers, three traditional producing countries (France, Italy, and Spain) and two net importers (Germany, and United Kingdom), are compared.

Similar to what Villanueva *et al.* (2015) studied for the American wine consumer of the last decades of the 20th century and the beginning of this 21st century, this article presents a historical, empirical, and econometric description of European wine consumer's demographic and socioeconomic characteristics within the years 1990 and 2014. Data analyzed and correlated correspond to official European Census variables (age, gender, household income, and level of education), and European wine industry variables (wine consumption in volume and per capita, and production). In this article, wine has been treated as a homogeneous good, while acknowledging that there are several wine categories; the data set on "wine consumption in volume" by Euromonitor (2015) does not discriminate by type of wine, it only accounts the total liters of wine consumed during a year.

The article is structured as follows. Section two presents the materials and methods, with sub-sections dedicated to the literature review and the model specification, in which the empirical model, the database, and the methodology are explained. Section three provides and discusses the econometric results. Finally, the conclusion, and the references are presented.

MATERIALS AND METHODS

Literature review

Wine consumption data is constantly observed and collected by international organizations such as the O.I.V. (International Wine Organization), the F.A.O. (Food and Agriculture Organization), and the W.H.O. (World Health Organization). Most academic literature based on wine consumer behavior concentrates in empirical studies that examine European, American, and international wine consumers' behavior and its characteristics. This vast literature deals with consumers' responses to price changes (Antoniolli *et al.*, 2011; Estrella Orrego *et al.*, 2012; Caracciolo *et al.*, 2013, to name a few); the influence of specific geographical traits and other qualitative wine characteristics on consumer preference (Lockshin *et al.*, 2006; Gallet, 2007; Casini *et al.*, 2009a; Mora and Moscarola, 2010; Tempesta *et al.*, 2010; Bernabéu *et al.*, 2012, to name a few); ways in which differences between products are communicated to the public (Boatto *et al.*, 2011; Sam and Thompson, 2012; Sirieix *et al.*, 2013, to name a few); the effects of state laws and taxes on the consumption of wine (Folwell *et al.*, 1991; Smith and Mitry, 2006, to name a few), and the launch of promotional campaigns to boost wine consumption in emerging wine consuming countries (Duarte Alonso, 2012; Pappalardo *et al.*, 2013; Barisan *et al.*, 2015, to name a few).

Also, some authors (Smith and Mitry, 2007; Mitry and Smith, 2009; Anderson, 2010) believe that the globalization process is leading to a convergence in wine consumption patterns by structuring similar models of consumption. This hypothesis of world convergence in wine consumption was tested and corroborated by Aizenman and Brooks (2005) from a tasting perspective, and Dal Bianco *et al.* (2013) in quantitative and culturally terms. Some studies have empirically investigated the convergence of wine consumption in a certain geographical area and its historical evolution (i.e. Smith and Skalnik, 1995 for the E.U and the U.S.; Smith *et al.*, 1999 and Smith and Mitry, 2007 for the E.U.; Dal Bianco *et al.* 2013 for the world).

The wine consumption literature shows that France, Italy and Spain are mature countries in terms of wine consumption, with a vast presence of wine in everyday life. The literature also agrees that Germany and the United Kingdom are growing in their wine consumption levels, and have not reach maturity. The literature shows a convergent process has happened within wine consumption in Europe (Smith and Skalnik, 1995; Bentzen *et al.*, 1998; Smith *et al.*, 1999; Bentzen *et al.*, 2001; Smith and Mitry, 2007; Smith and Mitry, 2012).

Still, while the majority of the literature emphasizes wine consumer behavior, the topic of wine consumer demographics presents itself as a distinctive and original area of research. There have been only a few rigorous academic studies of wine consumers and the determination, in some extent, of their demographic and socioeconomic profile. Some research has been done referred to wine consumer profiles in the United Kingdom (Ritchie, 2007; Phillips and Wilson, 2016), in Spain (Gil and Sánchez, 1997; De-Magistris *et al.*, 2014), in Italy (Casini *et al.*, 2009b), in France (Summerfield, 2013), in Germany (Szolnoki and Hoffmann, 2014; Wiedmann *et al.*, 2014), in Australia and New Zealand (Bruwer *et al.*, 2002; Johnson and Bruwer, 2003; Thomas and Pickering; 2003; Bruwer and Li, 2007), in Argentina (Yvon, 2007), in South Africa

(Ndanga *et al.*, 2009), in China (Camillo, 2012), in Chile (Palma *et al.*, 2014), and in the U.S. (Hussain *et al.*, 2006; Villanueva *et al.*, 2015). These papers employ different techniques to understand domestic consumer demographics and provide a description of wine consumer profiles, mainly using psychographic variables and qualitative analysis, and in very few cases, quantitative analysis.

This article contributes to the field of wine consumer demographics by defining a demographic and socioeconomic profile of wine consumers in Europe from 1990 and until 2014 through a quantitative, econometric analysis, the first study of its kind to our knowledge. Developing a profile of the wine consumer of Europe by analyzing socioeconomic and demographic data is a viable intent of identifying which consumers are more likely to buy wine. This article is one of the initial efforts to quantify the demographic profile of wine consumers in Europe by using European Census data and, this is, therefore, its major contribution to the analysis of wine consumption in Europe.

This article defines and compares the demographic and socio-economic profile of wine consumers over the past twenty-five years in five European countries, three traditional producing countries (France, Italy, and Spain) and two net importers (Germany, and United Kingdom).

Model specification

For this empirical study, a panel of variables referring to the consumption of wine from five European countries, France, Italy, Spain, the United Kingdom and Germany has been designed. These countries, traditionally consumers, account for 78% of the E.U. consumption of wine and 39% of the world consumption of wine (OIV, 2015). The period 1990-2014 is studied, forming a balanced panel where the variables specified are listed in Table I.

The *Environment Variables* selected, WPX (Wine Price), PROD (Wine Production) and CAP (Agricultural State Policies), influence wine consumers. The variable Wine Price is used in the studies of Salvador (2016), Camillo (2012), Gallet (2007), and Lockshin *et al.* (2006), among others, to conclude that prices are a significantly impactful variable on wine consumption. The variable Wine Production is introduced because, as Briz i Godino (2002) points out, “we cannot understand any production without consumption and vice versa, if the aim is to recognize the economic dynamics”. Finally, the variable Agricultural State Policies is important and representative of the wine consumption environment since the wine sector has historically been regulated in Europe (Castillo *et al.*, 2014). In this sense, authors like Castillo and Rodriguez (2009) mention the influence that Agriculture State Policies have into the consumption of wine.

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The descriptive statistics of the variables are included in Table II. As it can be seen, there is a wide range of variation of results, fundamentally for two reasons.

The first reason is that the large producing countries are mixed with others that are not significant producers. France, Italy and Spain, which account for 47.8% of world production and 81% of the European Union, are mixed with the United Kingdom and Germany accounting for only 3.3% of world production and 6% of the European Union (OIV, 2015). In 2014, the first wine producing country was France with 46.7 million hl, followed by Italy with 44.7 million hl, and Spain with 41.6 million hl. To a further distance was Germany with 9.2 million hl, and the United Kingdom with 1.4 million hl (OIV, 2015).

The second reason is that these two groups, France, Italy, and Spain in one side, and Germany and the United Kingdom in the other, show different behaviors in wine consumption. A consumption tendency function is calculated, $Y_{it} = \theta_0 + \theta_1 t_{it}$, where Y is the consumption of wine in each country i (data from Anderson and Nelgen 2011 and Euromonitor 2015). France, Italy and Spain have a tendency, θ_1 , that decreases between 1990 and 2014: $\theta_1 = -1.49$, $\theta_1 = -0.73$ and $\theta_1 = -0.57$, respectively. In contrast, the United Kingdom and Germany have a growing tendency, $\theta_1 = 0.56$ and $\theta_1 = 0.1671$, respectively.

In order to complete this information and given the disparity of data, an analysis was carried out to establish the possible differences in consumption in all five countries; The analysis gave two groups of countries: Group I, producing and exporting countries (France, Italy and Spain), and Group II, net importing countries (United Kingdom and Germany). The non-parametric Mann-Whitney contrast has to be applied; the reason of its use is the rejection of the Null Hypothesis of Normality in the Kolmogorov-Smirnov test (with a Kolmogorov-Smirnov Z value of 4,966 and a p-value of 0). The contrast of two independent samples with a U value of Mann-Whitney of 194 and a p-value of 0 indicates the existing difference in wine consumption between Group I and Group II.

Data analysis is completed by calculating the correlation between pairs of exogenous variables to avoid problems of linear dependence between them. Table III shows how the values of the coefficients are not relatively high, so as to affirm that there is no evidence of multicollinearity.

Taking into account this result, three models are estimated: a) a general model that integrates the five countries, and then b) a sub-model for the countries of Group I, and c) another sub-model for the countries of Group II.

Pooled Cross Section Time Series were used for the study to ensure a valid statistical inference. In particular, the Driscoll and Kraay correction was handled for the general model and for the Group I sub-model, while the Pooled OLS was used for the Group II sub-model.

To explain the variables that influence wine consumption in Europe, a model has been proposed, but not including the independent term, X_0 , in order to avoid multicollinearity from the dummy variables FR_{it} , IT_{it} , SP_{it} , UK_{it} and DE_{it} , ($FR_{it} + IT_{it} + SP_{it} + UK_{it} + DE_{it} = X_{0,it}$).

Substituting X_{kit} by the set of exogenous variables is obtained:

$$Y_{it} = \sum_{k=1}^K \beta_k X_{kit} + u_{it} = \beta_1 WPX_{it} + \beta_2 PROD_{it} + \beta_3 CAP99_{it} + \beta_4 CAP08_{it} + \beta_5 INCO_{it} + \beta_6 AGE_{it} + \beta_7 GEN_{it} + \beta_8 EDUC_{it} + \beta_9 MSMAR_{it} + \beta_{10} BEER_{it} + \beta_{11} FR_{it} + \beta_{12} IT_{it} + \beta_{13} SP_{it} + \beta_{14} UK_{it} + \beta_{15} DE_{it} + u_{it} \quad (1)$$

With $i=1,2, \dots, 5$; $t= 1990, 1991, \dots, 2014$.

To explain the differences in consumption between Group I and Group II, two sub-models were estimated from model (1). The variables FR_{it} , IT_{it} , SP_{it} , UK_{it} and DE_{it} were deleted and the independent term, $X_{0,it}$ was added. The equation to be estimated is:

$$Y_{it} = \sum_{k=0}^K \beta_k X_{kit} + u_{it} = \beta_0 X_{0,it} + \beta_1 WPX_{it} + \beta_2 PROD_{it} + \beta_3 CAP99_{it} + \beta_4 CAP08_{it} + \beta_5 INCO_{it} + \beta_6 AGE_{it} + \beta_7 GEN_{it} + \beta_8 EDUC_{it} + \beta_9 MSMAR_{it} + \beta_{10} BEER_{it} + u_{it} \quad (2)$$

With $i=1,2,3$ (FR, IT, SP) for Group I and $i=4, 5$ (UK, DE) for Group II; $t= 1990, 1991, \dots, 2014$.

The variable Y_{it} assumes the per capita consumption values. The independent variables handled are diverse and are classified into two categories. The first category is the *Variables of the Environment*: wine price (WPX), impact of European policies - Common Agricultural Policies (CAP99, CAP08), and country's wine production (PROD). The second set of variables are the *Variables of the Consumer*: income (INCO), age

(AGE), gender (GEN), level of education (EDUC), marital status – married (MSMAR), and beer consumption (BEER). In the general model, a third category is included: *Contribution Variables*: five dummies, one for each country, France (FR), Italy (IT), Spain (SP), United Kingdom (UK) and Germany (DE), in order to understand the contributions and differences of the five countries in terms of wine consumption.

RESULTS AND DISCUSSION

The Wald, Wooldridge and Breusch-Pagan tests identified, for the general model and the sub-model Group I, respectively, heteroskedasticity, autocorrelation and contemporary correlation. In contrast, the sub-model Group II made up of the countries of Germany and the United Kingdom showed errors either independent of each other or distributed identically with constant variance σ_u^2 (Table IV).

Regarding the probable problems of heteroscedasticity, autocorrelation and contemporary correlation, three methods were tested, a) Feasible Generalized Least Squares estimators, b) Standard Errors Corrected for Panel or Prais-Winsten regression, and c) the correction of Driscoll and Kraay (Hoechle, 2007). Estimated the models by the three methods, the least sum of residual squares corresponded to the correction of Driscoll and Kraay (Table V).

For the Group II sub-model, on the one hand, the F-test of significance of the fixed effects indicates that it is preferable to use the grouped model to the fixed-effects method ($F(1, 37) = 2.55$, $\text{Prob} > F = 0.1190$). On the other hand, testing the Breusch and Pagan tests for random effects indicates that the clustered model is better than the random effects model ($\text{chibar2}(01) = 0.00$, $\text{Prob} > \text{chibar2} = 1.0000$). Therefore, the Pooled OLS was applied.

The results of these analyzes are summarized in Table VI.

The *Environment Variables* present the expected behavior. Thus, the price variable (WPX) has relevance in the explanation of consumption; although in the producing countries, the segmentation in consumer prices makes this variable less determinant.

Wine production (PROD) is not relevant in terms of impacting to the general profile of the European wine consumer, countries that combine wine production and imports. This relates to the consumption of wine in the net importing countries (sub-model Group II), where the variable is also not significant. However, in the producing countries (sub-model Group I), and as expected, the variable is significant; the countries that produce the most are the ones which consume the most.

With regard to the European regulation of the Common Agricultural Policy (CAP), which seeks to promote domestic consumption, they have not favored wine consumption, having an internal negative influence on producing countries and showing irrelevancy to net importers countries. The CAP from 2008 has had a more negative influence than that of 1999.

The behavior of the *Consumer Variables* is key in the interpretation and description of the European wine consumer's profile in the last twenty five years.

Income (INCO) is significant and positive, as expected, indicating that the higher the per capita income is the higher the level of wine consumption. This is clearly in line with the fact that wine consumption has a high income elasticity, very determinant for its product segmentation. This is evidently happening in the three defined profiles, the general European profile, the European producers' profile, and the European net importers' profile, where a higher per capita income implies more accessibility in consumption and more differentiated and segmented purchasing strategies.

Neither the differentiation by age (AGE), nor gender (GEN), has a decisive influence on the aggregate consumption of wine. This fact confirms that women are approaching the dynamics of consumption of men, and that young people approach the more mature generations (classic consumers). In Group II wine consumption enters the younger generations. This information may lead us to assume there could be soon an interesting break point, a potential structural change of wine consumption where “*millennials*” will be the public-objective of the sustainability of wine consumption in Europe, an extremely important fact for the viability of the sector.

Regarding the consumer's education level (EDUC), the lower the education level, the more wine consumption is expected in the general European wine consumer profile and the European producers' profile. It is in the European net importers' profile that higher consumption is associated with a higher degree, making wine a drink with a more qualitative and less quantitative profile for this group of consumers

in the United Kingdom and Germany. The consumption of wine in these countries has a biased component to a more informed and qualified demand.

On the case of married marital status (MSMAR), the European net importers' profile also favors the consumption of wine with a greater number of married couples, which implies that family consumption and restaurant's consumption is more propitious. To the general European wine consumer profile and the European producers' profile, marital status does not represent any significant difference, all types of people consume wine.

Finally, it could be said the beer (BEER) traditionally should be considered as a substitute good for wine, since an increase in beer consumption may lead to a reduction in wine consumption. This is happening and defining the general European wine consumer profile and the European producers' profile, but it is not a fact in the definition of the European net importers' profile, where there is no substitution effect, clearly deriving in a division of differentiated products, uncompetitive among them. This ensures and consolidates the growth of wine consumption in large importing countries (Germany and the United Kingdom), regardless of the customary presence of beer consumption.

These are some interesting results that come from the empirical analysis of Table VI; the European producers' profile (France, Italy, and Spain) shows still some clear differences with the European net importers' profile (United Kingdom and Germany). The empirical description of consumers from Germany and the United Kingdom presents their wine consumer profile with higher income, married, and higher level of education than those consumers of the European producers' profile, and the general European profile.

These results for the European net importers' wine consumer profile (sub-model Group II, Germany and the United Kingdom) are similar to those described by Villanueva *et al.* (2015) for nowadays American wine consumers' profile. Anglo-Saxon Germanic European (Germany and the United Kingdom) wine consumers present a socio-economic and demographic profile closer to the profile of American (United States) wine consumers than to their counterparts in Europe, Latin European wine consumers (France, Italy, and Spain).

The behavior of the *Contribution Variables* of the general model allows us to verify that the countries have been decisive in the dynamics of wine consumption, albeit to a very different degree. Of note are France, as still the major producer and consumer of wine in Europe, and the United Kingdom, which maintains its status of largest importer and international target market. Then there is, at a distant place, Germany, and the other two classic producers, Italy and Spain, which lose quantitative weight among the privileged places of wine consumption.

CONCLUSIONS

Although wine consumption has quantitatively converged towards an unified and close value for most of the European countries (Smith and Mitry 2012), the article presents that net importers wine consuming countries in Europe, in this case Germany and the United Kingdom, have wine consumers that are demographically different compared to the traditional European wine consumer's profile from the producing wine countries, in this case France, Italy, and Spain. There are still major differences in the wine consumer profiles of both types of countries.

Through an econometric analysis of different demographic, production, consumption, and environmental variables, the article shows that wine consumers in Germany and the United Kingdom have different profiles to those of France, Italy, and Spain. The empirical description of consumers from Germany and the United Kingdom, alike to those of the United States, presents their wine consumer profile with higher income, married, and higher level of education than those consumers of the European wine producers' profile, and the general wine European profile.

The designed model has been able to detect certain novelties not previously captured in the literature, which can give clues and signs in order to pursue further qualitative analysis of wine consumers and wine consumption dynamics and its sustainability in traditional consumer countries and new consumer countries.

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Table I
Variables of the Empirical Model

Variables	Abbreviation	Typology	Description and Source
<i>Dependent Variable</i>			
Wine Consumption	Y	Continuous	Wine Consumption (liters per capita) Source: Anderson and Nelgen (2011) and Euromonitor (2015)
<i>Environment Variables</i>			
Wine Price	WPX	Continuous	Wine Unit Price per Liter (€/l) Source: Euromonitor (2015)
Production	PROD	Continuous	Wine Production (liters) Source: Anderson and Nelgen (2011) and Euromonitor (2015)
CAP1999	CAP99	Discrete	Common Agricultural Policy (CAP) of 1999, 0: 1990 to 1999; 1: 2000 to 2008, 0: 2009-2014
CAP2008	CAP08	Discrete	Common Agricultural Policy (CAP) of 2008; 0: 1990 to 2008; 1: 2009 to 2014
<i>Consumer Variables</i>			
Income	INCO	Continuous	Average Real Household Income (€) Source: Euromonitor (2015)
Age	AGE	Discrete	1: If the highest rate of variation of the population is between 21-30 years 2: If the highest rate of variation of the population is between 31-40 years 3: If the highest rate of variation of the population is between 41-50 years 4: If the highest rate of variation of the population is between 51-60 years 5: If the highest rate of variation of the population is 60 and + years Source: Euromonitor (2015)
Gender	GEN	Discrete	1: If the highest rate of variation of the population is masculine 2: If the highest rate of variation of the population is feminine Source: Euromonitor (2015)
Education	EDUC	Discrete	1: If the highest rate of variation of the population is high school's educated 2: If the highest rate of variation of the population is bachelor's educated Source: Euromonitor (2015)
Marital Status – Married	CSMAR	Continuous	Married Couples Source: Euromonitor (2015)
Beer Consumption	BEER	Continuous	Beer Consumption (liters per capita) Source: Euromonitor (2015)
<i>Contribution Variables</i>			
France	FR	Discrete	1: France; 0: rest of countries
Italy	IT	Discrete	1: Italy; 0: rest of countries
Spain	SP	Discrete	1: Spain; 0: rest of countries
United Kingdom	UK	Discrete	1: United Kingdom; 0: rest of countries
Germany	DE	Discrete	1: Germany; 0: rest of countries

Table II
Descriptive statistics of the variables

Dependent Variables	N	Minimum	Maximum	Media	Typical Deviation	
Y	125	11.2	74.5	33.99592	15.02287	
Independent Variables (Continuous)	N	Minimum	Maximum	Media	Typical Deviation	
WPX	125	1.330864	10.6	4.787681	3.376747	
PROD	125	1000000	6.58e+09	2.98e+09	2.22e+09	
INCO	125	8442.8	36099.4	24692.83	6848.612	
MSMAR	125	-165100	267800	1811.689	73485.15	
BEER	125	25.3	145.5	71.78176	37.66911	
Independent Variables (Discrete)	Freq. (=0)	Freq. (=1)	Freq. (=2)	Freq. (=3)	Freq. (=4)	Freq. (=5)
CAP99	80	45				
CAP08	95	30				
AGE		0	18	30	50	22
GEN		13	107			
EDUC		75	45			
FR	100	25				
IT	100	25				
SP	100	25				
UK	100	25				
DE	100	25				

Table III
Independent variable correlation coefficients

	BEER	WPX	PROD	AGE	GEN	CSMAR	INCO	EDUC	CAP99	CAP08	UK	FR	SP	IT	DE
BEER	1														
WPX		1													
PROD			1												
AGE				1											
GEN					1										
CSMAR						1									
INCO							1								
EDUC								1							
CAP99									1						
CAP08										1					
UK											1				
FR												1			
SP													1		
IT														1	
DE															1

Table IV
Results of Wald Test, Wooldridge Test and Breusch-Pagan Test

	Wald Test	Wooldridge Test	Breusch and Pagan Test
General model	chi2 (5) = 58.54 Prob>chi2 = 0.0000	F(1, 4) = 82.073 Prob > F = 0.0008	chi2(10) = 25.019 Pr = 0.0053
Group I sub-model	chi2 (3) = 6.78 Prob>chi2 = 0.0188	F(1, 2) = 65.735 Prob > F = 0.0149	chi2(3) = 13.134 Pr = 0.0044
Group II sub-model	chi2 (2) = 0.63 Prob>chi2 = 0.7307	F(1, 1) = 9.419 Prob > F = 0.2005	chi2(1) = 0.099 Pr = 0.7532

p-value ≤ 0.05 H0 is rejected: constant variance, nule autocovariances, transversal independence

Table V
Sum of residual squares

	FGLS regression	Prais-Winsten regression	Regression with Driscoll-Kraay
General model	3.51	3.1798	3.1548
Group I sub-model	5.5316	4.8130	4.7985

Table VI
Wine Consumer Profiles in Europe

	General model	Group I sub-model	Group II sub-model
WPX	-6.223391*** (-9.65)	0.0364402 (0.07)	-1.004847* (-1.84)
PROD	1.1809 (0.98)	3.7609*** (3.34)	5.4409 (1.51)
CAP99	-3.620398** (-2.19)	-8.446647** (-2.39)	0.7233149 (0.83)
CAP08	-9.526658*** (-3.78)	-17.61166*** (-4.17)	-0.2896482 (-0.24)
INCO	0.0005674*** (4.91)	0.0007207** (2.64)	0.0004293*** (5.52)
AGE	-0.044696 (-0.20)	-0.0854295 (-0.11)	-0.4026052* (-1.75)
GEN	-0.7302839 (-0.65)	2.045287 (1.21)	-0.5856373 (-0.93)
EDUC	-4.579146*** (-3.37)	-4.665667** (-2.32)	8.283221* (1.60)
MSMAR	4.4706 (0.86)	-8.5306* (-1.74)	0.0000255*** (4.46)
BEER	-0.1497518* (-1.67)	-0.1327282** (-2.11)	0.0074822 (0.27)
FR	100.4701*** (9.25)	-	-
IT	55.00179*** (7.00)	-	-
SP	49.03495*** (7.07)	-	-
UK	87.33526*** (12.33)	-	-
DE	49.95386*** (4.77)	-	-
Cons	-	23.69432** (2.57)	2.460917 (0.25)
F	2141.71	77.20	67.59
Prob > F	0	0	0
R-squared	0.9935	0.8779	0.9481
Root MSE	3.1548	4.7985	1.1867

*p<0.10; **p<0.05; ***p<0.001. Between parentheses, estimated coefficients t-statistics.