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AN ANALYSIS OF THE RELATION BETWEEN WINE CONSUMPTION AND CULTURAL MODELS¹

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Summary

The paper describes the correlation among grape-bearing areas, grape production, wine production, wine consumption and population figure for various countries. Secondly, it explains the correlation among wine consumption, wine consumer expenditure and a country's cultural model with reference to the population's religion in some countries. The statistical method used in testing these connections was the Bravais-Pearson correlation coefficient. An additional analysis of the distribution of grape production, wine production, and wine consumption for the world's top ten countries was made. Although wine consumption is banned by Islam, Buddhism and Hinduism, there are some Muslim, Buddhist and Hindu majority countries with a high level of wine consumption per capita. This high level is determined neither by the other religion population nor by foreign tourists, but rather by the way in which religion is understood and practiced by individuals.

Key words: *grape, wine consumption, wine consumer expenditure, cultural models, religion.*

JEL: *C10, E21, L66, Q02*

Introduction

Wine has been produced by people ever since the Neolithic period, between 8,000 and 3,500 BC, by crushing both grapes and date palm and allowing the resulting juice to ferment. Even today it is not clear in which part of the world the first wine was produced, either in China, Iran, Turkey, Armenia, Azerbaijan, Macedonia, or in Greece etc. Nowadays, the wine production in some European countries such as France, Germany, Austria, etc. is the result of the propagation of the wine technology by the Roman Empire (Hames, 2014; Vlahović et al., 2012).

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Although alcohol became a part of human consumption long ago, its adverse and beneficial health effects have only been recently highlighted (Ene, 2009). Therefore, numerous studies on vineyard soil, grape and wine quality were undertaken to identify if certain substances content (e.g. copper, zinc, manganese, etc.) does not exceed the allowable limits (Calin et al., 2012) or if new potential dangerous substances for human health become manifest.

The importance of wine for human consumption, along with other economic, social and technical factors, determined the appearance of wine tourism in the middle of the 19th century, even if testing wine and visiting vineyards as parts of an organized trip has been known since ancient Rome and Greece. Nowadays, there is no clear statistical data by country concerning wine tourism. The countries with wine tourism supply are considered the ones with the highest wine production, and are clustered into the ‘Old World’ (France, Italy, Germany, Spain, etc.) and the ‘New World’ (New Zealand, Australia, United States, South Africa, etc.) wine regions (Hall et al., 2002; Scutariu, 2013).

Goals, data sources and methodology

The first goal of the paper is to identify the type of correlation among grape-bearing areas, grape production, wine production, wine consumption, and population figures. The second goal is to test the way in which wine consumption, wine consumer expenditure, and cultural models, as determined by the population’s religion, correlate.

Given these goals, a data set was built, which includes the grape-bearing areas, grape production, wine production, wine consumption, population figures, Muslim, Buddhist and Hindu population figures, and wine consumer expenditure by country in 2012 (Appendix 1).

Exhaustive data was included in Appendix 1 so as to guarantee the objectivity of the results. Although ten different sources were used to collect data, it was impossible to establish a complete database, because some countries did not report data, so it was recorded as not available (n/a).

Initially, Appendix 1 contained 242 countries. After double-checking the scientific references available, only 109 countries remained therein (from Afghanistan to Zimbabwe). This reduction was due to the lack of data, since some countries had data only for wine consumption and population figure, which was not enough to achieve the two above mentioned goals of the paper.

However, a further list of 43 countries’ data (from Bangladesh to Uganda) was introduced at the end of the Appendix 1 in order to be used only in testing some correlations along with the existing 109 countries’ data, to ensure more exhaustive data for analytical purposes.

In Appendix 1 it can be noticed that the wine consumption values expressed in liters per capita were calculated with four decimal places instead of two decimal places, which was used for wine consumption in liters per capita. The reason was to emphasize the low level of wine consumption in liters per capita in some countries (e.g. Iran) and to ensure the correctness of the data needed for analysis – otherwise, the reported values included in the Appendix 1 should have been zero.

As regards the statistical method, the Bravais-Pearson correlation coefficient was used to highlight the presence or absence of the correlations among grape-bearing areas, grape production, wine production, wine consumption, population figure, Muslim, Buddhist and Hindu population figures, and wine consumer expenditure.

The relation among grape-bearing areas, grape production, wine production, wine consumption and population figure

First of all, it is important to test the correlation between grape-bearing areas and grape production to point up the influence of atmospheric and economic factors on grape production (Table 1).

Table 1. Correlation between grape-bearing areas and grape production

		Grape-bearing areas
Grape production	Pearson Correlation	.899**
	Sig. (2-tailed)	.000
	N	109

Source: Author's own calculation based on data in Appendix 1.

Note: **. Correlation is significant at the 0.01 level (2-tailed).

The data in Table 1 show the presence of a strong and positive correlation grape-bearing areas and grape production. Thus, the higher the grape-bearing areas, the higher the grape production. The value of this correlation is not perfect (it should equal 1) due to the difference among the surveyed countries' grape production level, which is influenced both by independent factors (air temperature, atmospheric humidity, sunlight, rainfall, soil composition, etc.) and dependent factors (economic efficiency, harvest planning, etc.).

Secondly, it is useful to establish if all the countries that produce grapes are also wine producers (Table 2).

Table 2. Correlation between grape production and wine production

		Grape production
Wine production	Pearson Correlation	.798**
	Sig. (2-tailed)	.000
	N	109

Source: Author's own calculation based on data in Appendix 1.

Note: **. Correlation is significant at the 0.01 level (2-tailed).

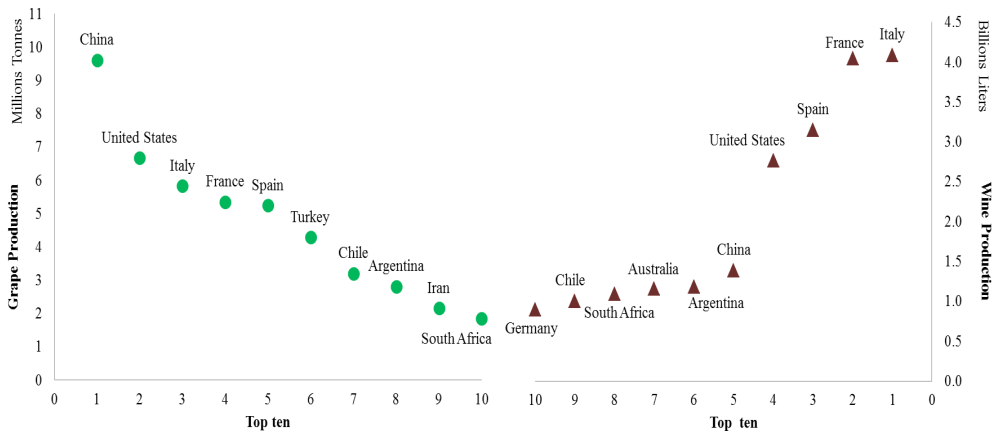
Due to the fact that the correlation coefficient value in Table 2 belongs to the interval [0.5; 0.8), (Lunau et al., 2013), there is a moderate and positive correlation between grape production and wine production. The correlation is not strong or perfect because, even though some countries produce grapes, these countries do not report wine production. The following cases have been identified:

- some countries have a Muslim majority population, e.g. Afghanistan (99.7%), Iran (99.5%), Yemen (99.1%), Iraq (99%), Occupied Palestinian Territory (97.6%), Libya (96.6%), Pakistan (96.4%), and Saudi Arabia (93%) (Pew Research Center, 2012). Hussain (2011) states that Islamic law prohibits alcohol consumption and that practicing Muslims do not drink alcohol irrespective of the type of drink and the time of day. This might be one of the many explanations for which these countries did not give details about their wine production. Instead, other countries that have a Muslim majority population as well, e.g. Morocco (99.9%), Turkey (98%), Jordan (97.2%), Azerbaijan (96.9%), Tajikistan (96.7%), Uzbekistan (96.7%), Egypt (94.9%), Turkmenistan (93%), Syria (92.8%), Kyrgyzstan (88%), Albania (80.3%), Kazakhstan (70.4%) and Lebanon (61.3%), (Pew Research Center, 2012) did report their wine production.
- some countries have both a Muslim majority population, e.g. United Arab Emirates (76.9%) Kuwait (74.1%), Bahrain (70.3%), and Qatar (67.7%), (Pew Research Center, 2012), and maybe a low quantity of wine production due to a low quantity of grape production, e.g. United Arab Emirates (55 tonnes), Kuwait (45 tonnes), Bahrain (145 tonnes), and Qatar (8 tonnes), (Food and Agriculture Organization of the United Nations Statistics Division, 2012b);
- some countries have a Muslim minority population, e.g. Tanzania (35.2%), Thailand (5.5%), Vietnam (0.2%), (Pew Research Center, 2012), and a slightly higher grape production, e.g. Tanzania (18,000 tonnes), Thailand (80,000 tonnes), Vietnam (15,308 tonnes), (Food and Agriculture Organization of the United Nations Statistics Division, 2012b);
- some countries have a Muslim minority population, e.g. Netherlands (6%) and the Philippines (5.5%), (Pew Research Center, 2012), and a low grape production, e.g. Netherlands (1,200 tonnes) and the Philippines (169 tonnes), (Food and Agriculture Organization of the United Nations Statistics Division, 2012b) and perhaps they do not produce wine;
- some countries have a very low Muslim population level, e.g. Namibia (0.3%), Taiwan (0.1%), Venezuela (0.3%), Colombia (0.1%), and Guatemala (0.1%), (Pew Research Center, 2012), but they have a rather high grape production, e.g. Namibia (23,000 tonnes), Taiwan (99,267 tonnes), Venezuela (20,000 tonnes), Colombia (24,701 tonnes), and Guatemala (18,500 tonnes), (Food and Agriculture Organization of the United Nations Statistics Division, 2012b);
- some countries have a very low Muslim population level, e.g. Ecuador (0.1%) and Honduras (0.1%), (Pew Research Center, 2012), but they have a low grape production level, e.g. Ecuador (400 tonnes) and Honduras (182 tonnes), (Food and Agriculture Organization of the United Nations Statistics Division, 2012b);
- for some countries the economic efficiency of raisin production might be much higher than wine production (Subic et al., 2010), taking into account that these countries reported raisin production, e.g. Afghanistan (32,000 tonnes) and Iran (150,000 tonnes), (USDA, 2015).

The strong correlation between grape production and wine production is underscored by the following analysis of the distribution of grape production and wine production for the world's top ten countries as well (Figure 1).

In 2012 the main grape producers were China, United States, Italy, France and Spain and the main wine producers were Italy, France, Spain, United States and China.

Figure 1. Distribution of grape production and wine production for the world's top ten countries in 2012



Source: Author's own elaboration based on data in Appendix 1.

Although the hierarchy of the world's top ten countries is slightly different for both grape production and wine production, there are 8 out of 10 countries that take part in the two rankings at the same time, i.e. China, Italy, United States, France, Spain, Chile, Argentina and South Africa.

Turkey and Iran as major grape producers are no longer in the top ten of the most important wine producers. Their places were taken by Argentina and Germany.

Thirdly, the correlation between wine production and wine consumption was surveyed so as to emphasize if the countries that produce wine are the same with the ones that consume wine (Table 3).

Table 3. Correlation between wine production and wine consumption

		Wine production
Wine consumption	Pearson Correlation	.854**
	Sig. (2-tailed)	.000
	N	109

Source: Author's own calculation based on data in Appendix 1.

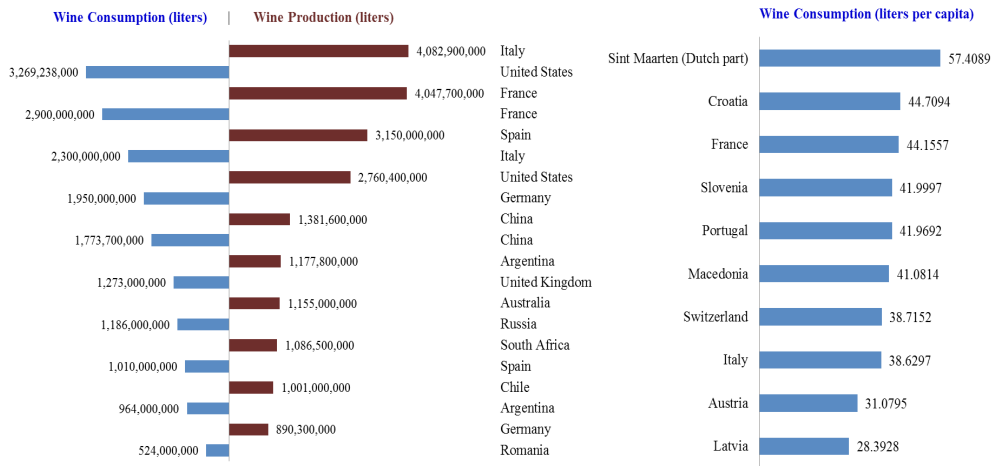
Note: **. Correlation is significant at the 0.01 level (2-tailed).

The Bravais-Pearson correlation coefficient in Table 3 is higher than .8, which means that there is a strong and positive correlation between wine production and wine consumption.

This indicates that most of the analyzed countries share both the culture of producing and that of consuming wine. According to the data in Appendix 1, there are 39 out of 109 countries that do not produce wine but consume wine instead, one (Réunion) out of 109 countries that does not consume wine but produces both grapes and wine, and one (Occupied Palestinian Territory) out of 109 countries that neither consumes nor produces wine, but instead produces grapes.

The strong correlation between wine production and consumption is also highlighted by the analysis of wine production and consumption for the world’s top ten countries (Figure 2).

Figure 2. Distribution of wine production and consumption for the world’s top ten countries in 2012



Source: Author’s own elaboration based on data in Appendix 1.

The data in Figure 2 show a similar situation to the one described in Figure 1, i.e. that the hierarchy of the world’s top ten countries is somewhat different for both wine production and consumption, but there are 7 out of 10 countries that belong to both rankings, such as the United States, France, Italy, Germany, China, Spain, and Argentina.

Instead, a significant disparity emerges between the hierarchies of the world’s top ten countries concerning wine consumption expressed in liters and wine consumption expressed in liters per capita. Only France and Italy were present in both top ten countries hierarchies, which means that in these countries wine consumption has a relatively homogenous distribution among people from different categories defined by gender, age, disposable income, etc.

The main countries with the highest wine consumption per capita were Sint Maarten (Dutch part), (57.4089 liters per capita), Croatia (44.7094 liters per capita), France (44.1557 liters per capita), Slovenia (41.9997 liters per capita), and Portugal (41.9692 liters per capita). The explanation for Sint Maarten’s (Dutch part) first place is that this country had a low population figure, but reported a rather high wine consumption, i.e. 2,244,000 liters.

Fourthly, testing the correlation between wine production and population figure, on the one hand, and between wine consumption and population figure, on the other hand, explains the possible influence of the population figure over wine production and consumption (Table 4).

Table 4. Correlation between wine production and population figure, and between wine consumption and population figure

		Population figure
Wine production	Pearson Correlation	.173
	Sig. (2-tailed)	.072
	N	109
Wine consumption	Pearson Correlation	.295**
	Sig. (2-tailed)	.002
	N	109

Source: Author's own calculation based on data in Appendix 1.

Note: **. Correlation is significant at the 0.01 level (2-tailed).

The Bravais-Pearson correlation coefficient values in Table 4 are significantly different. Thus, on the one hand, there is no correlation between wine production and population figure, and, on the other hand, there is a weak and positive correlation between wine consumption and population figure.

This situation demonstrates that the quantity of wine production obtained by a country does not depend on that country's population figure. The main factor determining wine production is represented by a country's geographical position, which ensures the specific pedoclimatic conditions for vines to grow and to produce grapes.

The vine *Vitis vinifera* is cultivated in areas between latitudes 30° and 50° north and south, but also near the Equator (Unwin, 2005). The grapes start to grow when the air temperature is higher than 10°C, at altitudes below 300 m above the sea level in cool regions, up to 1,000 m above the sea level in warmer regions and over 1,000 m above the sea level in hot and very hot regions (e.g. 2,000 - 2,600 m in Mexico, Bolivia, and Ecuador), (Creasy, Creasy, 2009; Skelton, 2009).

Nevertheless, the distribution and variation of temperature, sunshine and rainfall (400 - 800 mm per year) over several months depending on the northern or southern hemisphere is important (Unwin, 2005). The vine grows in different types of soil, but rock and wet subsoil close to the surface are not appropriate (Shry, Reiley, 2011).

However, wine consumption only slightly depends on the country's population figure because not every country's population consumes wine and, when people do consume wine, it is not a daily consumption.

Tamang and Samuel (2010) mention that world dietary culture is based on staple cereal diets with some differences from a region to another, i.e. rice in Eastern countries, wheat and barley-based food in Western countries and Australia, sorghum and maize-based foods in Africa and South America etc.

Wine is not a staple food due to the low weight of wine consumer expenditure in the disposable income for most of the world countries (Appendix 2). Thus, in 2011 the top ten countries with the highest weight of wine consumer expenditure in the disposable income were Latvia (1.524%), Hungary (1.453%), Estonia (1.392%), Belarus (1.114%), Switzerland (1.092%), Argentina (1.024%), Sweden (0.995%), Belgium (0.946%), Poland (0.909%), and Czech (0.883%). By contrast, the countries with the lowest weight were Pakistan (0%), India (0.003%), Turkey (0.005%), Indonesia (0.005%), United Arab Emirates (0.007%), Egypt (0.008%), Ecuador (0.023%), China (0.036%), Vietnam (0.042%) and Nigeria (0.042%).

However, the data in Appendix 2 underscore something different about the weight of wine consumer expenditure in the alcoholic beverages consumer expenditure. For four countries the weight of wine consumer expenditure exceeded two thirds of the alcoholic beverages consumer expenditure, i.e. Switzerland (78.18%), Italy (69.87%), Portugal (69.37%), Belgium (68.95%), and for three other countries the weight of wine consumer expenditure was between a half and two thirds of the alcoholic beverages consumer expenditure, i.e. France (58.88%), Denmark (54.81%) and Tunisia (53.49%).

For 15 countries the weight of wine consumer expenditure was between one third and a half of the alcoholic beverages consumer expenditure, i.e. Sweden (49.15%), Netherlands (48.08%), United Kingdom (47.87%), Algeria (47.03%), Croatia (46.24%), Argentina (45.41%), Spain (44.23%), Greece (38.07%), Germany (37.31%), New Zealand (37.15%), Ireland (36.82%), Norway (36.49%), Singapore (36.26%), Australia (34.85%) and Hong Kong (34.69%).

Instead, Pakistan (0%), India (0.56%), Turkey (2.76%), Thailand (2.92%), Colombia (3.10%), Venezuela (3.19%), Bolivia (3.98%), Jordan (4.22%), Vietnam (4.45%) and Ecuador (4.67%) had the lowest weight of wine consumer expenditure in the alcoholic beverages consumer expenditure.

The relation among wine consumption, wine consumer expenditure and cultural models

It is helpful to find out how wine consumption per capita and wine consumer expenditure per capita correlate for a better understanding of the amount of money used to buy wine and the wine quantity that is consumed (Table 5).

Table 5. Correlation between wine consumption per capita and wine consumer expenditure per capita

		Wine consumption per capita
Wine consumer expenditure per capita	Pearson Correlation	.454**
	Sig. (2-tailed)	.000
	N	109

Source: Author's own calculation based on data in Appendix 1

Note: **. Correlation is significant at the 0.01 level (2-tailed).

The Bravais-Pearson correlation coefficient value in Table 5 belongs to the interval [0.1; 0.5), (Lunau et al., 2013). Thus, there is a weak and positive correlation (but very close to a moderate correlation because the value is near .5) between wine consumption per capita and

wine consumer expenditure per capita. So, in the case of some countries, the more people consume wine, the more they spend money on buying wine.

The reason for a weak correlation between wine consumption per capita and wine consumer expenditure per capita is that, even if some countries had very close values of wine consumption per capita, e.g. Lithuania (0.1195 liters per capita), Vietnam (0.1407 liters per capita), they recorded substantial differences between their wine consumer expenditure per capita, e.g. Lithuania (118.32 US\$ per capita), Vietnam (0.22 US\$ per capita), (Euromonitor International Ltd., 2013b).

There are at least two essential factors that generated these disparities:

- the consumer's buying price for wine is significantly different from a country to another;
- wine consumption does not have a normal distribution among all the people in a country. There are people who belong to some social categories that consume and spend more money on wine than others.

One of the many influential factors of wine consumption is the country's cultural model which is determined by religion. Alcohol consumption is banned according to the holy books of some religions.

Alcohol or wine consumption represents a vice for the following sacred writings (Kalman, 2009; Robertson, 2004; Worden, 2003):

- in the Qur'an of Islam it is written that "Surely wine and gambling and stone pillars and divining arrows are an abomination of the work of Satan" (Fuller, 1996);
- in the Tipitaka (Pali Canon) of the Buddhist religion, the fifth rule of the Novices' ten Abstentions (known as Sikkhāpadas) stipulates the "abstinence from drinking wines and spirits" (Allen, 2008);
- in the Bhagavad-Gita of Hinduism it is asserted that "Such demoniac people are only attracted by wine, women, gambling and meat-eating" (Bhaktivedanta Swami Prabhupada, 2004).

Taking into account the wine consumption restriction in Islam, Buddhism and Hinduism, it is useful to identify how the wine consumption per capita and the country's weight of Muslim, Buddhist and Hindu population correlate (Table 6). The 152 countries' data were used in testing this correlation made by the standard 109 countries' data in the Appendix 1 and the 43 additional countries' data at the end of Appendix 1 which contain data only to be used in testing this correlation (wine consumption per capita and the country's weight of Muslim, Buddhist and Hindu population) and the next correlation (wine consumer expenditure per capita and the country's weight of Muslim, Buddhist and Hindu population) in order to ensure exhaustive data for analysis.

Table 6. Correlation between wine consumption per capita and the country’s weight of Muslim, Buddhist and Hindu population

		Country’s weight of Muslim population	Country’s weight of Buddhist population	Country’s weight of Hindu population
Wine consumption per capita	Pearson Correlation	-.352**	-.155	-.141
	Sig. (2-tailed)	.000	.057	.083
	N	152	152	152

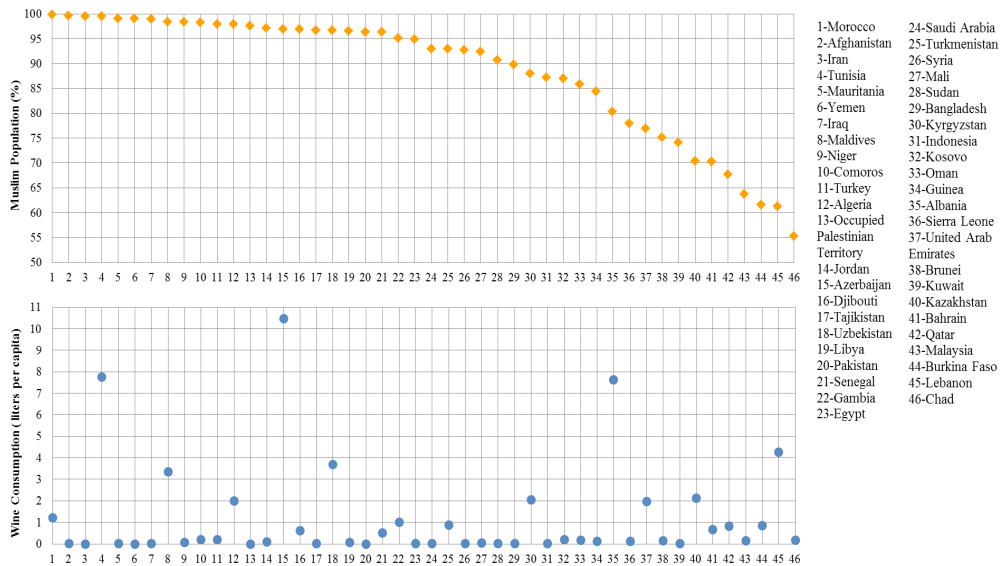
Source: Author’s own calculation based on data in Appendix 1.

Note: **. Correlation is significant at the 0.01 level (2-tailed).

Firstly, the value of the Bravais-Pearson correlation coefficient shows a weak and negative correlation between wine consumption per capita and the country’s weight of Muslim population. Hence, the higher the country’s weight of Muslim population, the lower the wine consumption per capita.

This correlation is weak due to the fact that some Muslim majority countries have relatively high levels of wine consumption per capita. Thus, in Figure 3 is displayed the distribution of wine consumption per capita and the weight of the Muslim population for the world countries (46 countries according to Appendix 1) that have over 50% Muslim population.

Figure 3. Distribution of wine consumption per capita and weight of the Muslim population for the Muslim majority countries in 2012



Source: Author’s own elaboration based on data in Appendix 1.

Countries such as Azerbaijan (96.9% Muslim population and 10.4564 liters per capita), Tunisia (99.5% Muslim population and 7.7662 liters per capita), Albania (80.3% Muslim population and 7.6383 liters per capita), Lebanon (61.3% Muslim population and 4.2623 liters per capita), Uzbekistan (96.7% Muslim population and 3.7012 liters per capita), Maldives (98.4% Muslim population and 3.3595 liters per capita), Kazakhstan (70.4%

Muslim population and 2.1320 liters per capita), Kyrgyzstan (88% Muslim population and 2.0586 liters per capita), Algeria (97.9% Muslim population and 1.9984 liters per capita), United Arab Emirates (76.9% Muslim population and 1.9560 liters per capita), Morocco (99.9% Muslim population and 1.2238 liters per capita), Gambia (95.1% Muslim population and 0.9999 liters per capita), Turkmenistan (93% Muslim population and 0.8794 liters per capita), etc. contribute to the weak correlation between wine consumption per capita and the country's weight of Muslim population.

The situation in the previously mentioned countries is the opposite of that in Occupied Palestinian Territory (97.6% Muslim population and 0 liters per capita), Iran (99.5% Muslim population and 0.0004 liters per capita), Yemen (99.1% Muslim population and 0.004 liters per capita), Pakistan (96.4% Muslim population and 0.0004 liters per capita), Bangladesh (89.8% Muslim population and 0.0005 liters per capita), Syria (92.8% Muslim population and 0.011 liters per capita), Tajikistan (96.7% Muslim population and 0.0012 liters per capita), Sudan (90.7% Muslim population and 0.0023 liters per capita), Saudi Arabia (93% Muslim population and 0.0029 liters per capita), Afghanistan (99.7% Muslim population and 0.0050 liters per capita), Mauritania (99.1% Muslim population and 0.0076 liters per capita), Kuwait (74.1% Muslim population and 0.0111 liters per capita), Indonesia (87.2% Muslim population and 0.0113 liters per capita), Iraq (99% Muslim population and 0.0130 liters per capita), etc.

Secondly, according to the values of the Bravais-Pearson coefficient in Table 6, which are statistically significant up to .05 level, there is no correlation between wine consumption per capita and the country's weight of Buddhist population, on the one hand, and between wine consumption per capita and the country's weight of Hindu population, on the other hand.

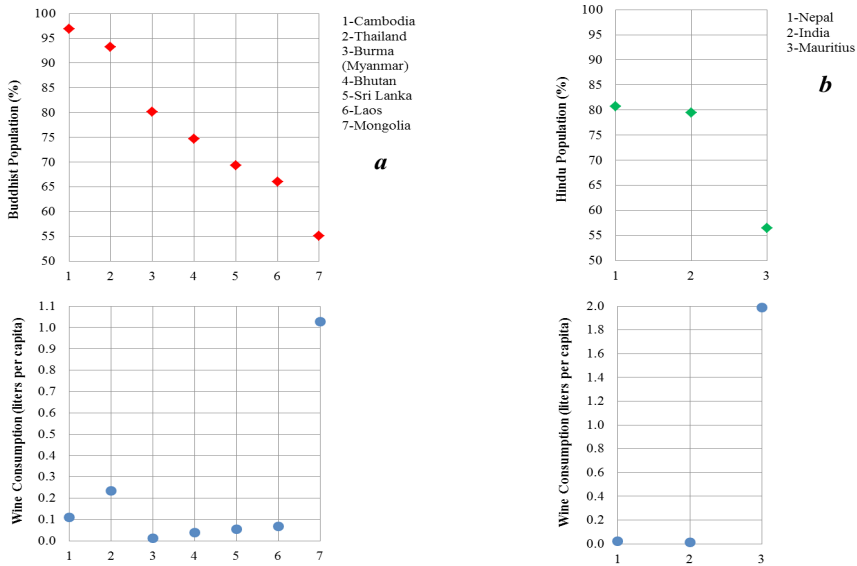
If a .1 level of significance is admitted, then the Bravais-Pearson coefficient in Table 6 shows a weak and negative correlation between wine consumption per capita and the country's weight of Buddhist population. The same strength and direction of the correlation is between wine consumption per capita and the country's weight of Hindu population.

The absence of any correlation for .05 level or the weak correlation for .1 level is explained in some way by the distribution of wine consumption per capita and the weight of the Buddhist and Hindu population for the Buddhist and Hindu majority countries (Figure 4). The seven countries that have over 50% Buddhist population and the three countries that have over 50% Hindu population alone cannot counterbalance the other world countries' high wine consumption.

In the case of the Buddhist majority countries, there are countries with both a low weight of Buddhist population and a low wine consumption per capita level, e.g. Burma (80.1% Buddhist population and 0.0130 liters per capita), Bhutan (74.7% Buddhist population and 0.0391 liters per capita), Sri Lanka (69.3% Buddhist population and 0.0543 liters per capita), and Laos (66% Buddhist population and 0.0667 liters per capita), that are opposed to others that have both a high weight of Buddhist population and a high wine consumption per capita level, e.g. Thailand (93.2% Buddhist population and 0.2355 liters per capita).

A similar situation is encountered in the Hindu majority countries, in which even though Nepal has a higher weight of Hindu population (80.7%) than India (79.5%), it also has a higher wine consumption per capita than India, i.e. 0.0222 liters per capita against 0.0116 liters per capita.

Figure 4. Distribution of wine consumption per capita and the weight of Buddhist (a) and Hindu (b) population for the Buddhist and Hindu majority countries in 2012



Source: Author’s own elaboration based on data in Appendix 1.

Another important correlation which can be tested is between wine consumer expenditure per capita and the country’s weight of Muslim, Buddhist and Hindu population (Table 7). Both the 109 and the 152 countries’ data were selected to analyze this correlation by simultaneously using only the existing data for wine consumer expenditure per capita and still offering the possibility to compare the results with the previous correlation.

Table 7. Correlation between wine consumer expenditure per capita and the country’s weight of Muslim, Buddhist and Hindu population

		Country’s weight of Muslim population	Country’s weight of Buddhist population	Country’s weight of Hindu population
Wine consumer expenditure per capita	Pearson Correlation	-.358**	-.077	-.074
	Sig. (2-tailed)	.000	.426	.445
	N	109	109	109
Wine consumer expenditure per capita	Pearson Correlation	-.333**	-.105	-.105
	Sig. (2-tailed)	.000	.196	.196
	N	152	152	152

Source: Author’s own calculation based on data in Appendix 1.

Note: **. Correlation is significant at the 0.01 level (2-tailed).

The values of the Bravais-Pearson coefficient in Table 7 for both the 109 and the 152 countries' data show, on the one hand, a weak and negative correlation between wine consumer expenditure per capita and the country's weight of Muslim population. Thus, the higher the country's weight of Muslim population, the lower the wine consumer expenditure per capita. The same strength and direction of the correlation is noticeable in the case of the wine consumption per capita and the country's weight of Muslim population.

There is no correlation between wine consumer expenditure per capita and the country's weight of Buddhist population for both the 109 and the 152 countries' data because the significance level (.426 and .196) considerably exceeds .05 or .1. The same absence of correlation is evident between the wine consumer expenditure per capita and the country's weight of Hindu population and is due to the high (.445 and .196) significance level.

Conclusions

There is a strong connection between the top ten countries with grape-bearing areas and the top ten countries with grape production. Countries such as Spain, France, Italy, China, Turkey, United States, Argentina, Iran and Chile are present in both hierarchies. Only Portugal which occupies the 10th place in the ranking of countries with the largest grape-bearing areas was replaced by South Africa in the ranking of countries with the highest grape production.

The weight of wine consumer expenditure in the alcoholic beverages consumer expenditure is higher than the weight of wine consumer expenditure in disposable income for most of the world countries. Thus, for consumers wine occupies an important place in the alcohol beverages category.

Six countries of the top ten countries with the highest wine consumer expenditure per capita were in the same top ten of the countries with the highest weight of wine consumer expenditure in the alcoholic beverages consumer expenditure, i.e. Switzerland, Sweden, Belgium, Denmark, France, and United Kingdom. Instead, only three countries of the top ten countries with the highest wine consumer expenditure per capita were present in the same top ten countries with the highest weight of wine consumer expenditure in disposable income, i.e. Switzerland, Sweden, and Belgium.

Switzerland and France were the only countries that belong to both the top ten countries with the highest wine consumption per capita and the highest wine consumer expenditure per capita. Thus, these states' populations spend more money on buying wine than others, if one takes into account that they consumed less wine than other countries' populations (e.g. France versus Sint Maarten - Dutch part and Croatia, on the one hand, and Switzerland versus Sint Maarten - Dutch part, Croatia, Slovenia, Portugal and Macedonia, on the other hand).

Even though wine consumption is prohibited by religions such as Islam, Buddhism and Hinduism, some Muslim majority countries (e.g. Morocco, Tunisia, Maldives, Algeria, Azerbaijan, Uzbekistan, Kyrgyzstan, Albania, United Arab Emirates, Kazakhstan, and Lebanon) reported over 1 liter per capita wine consumption. This unusual situation is because there are countries with both a higher weight of Muslim population and a higher wine

consumption per capita level than others with slightly lower weights of Muslim population and with a lower wine consumption per capita, e.g. Morocco, Tunisia, Maldives, Algeria, Azerbaijan, Uzbekistan, Kyrgyzstan, etc. against Indonesia, Oman, Guinea, Brunei, Kuwait, Malaysia, Chad etc.

The same situation is encountered in the Buddhist majority countries but to a lesser extent, i.e. only Thailand had a higher wine consumption per capita level and a lower weight of Buddhist population than Cambodia. Only one similar exception is found in the Hindu majority countries, i.e. India, which had a higher wine consumption per capita level and a lower weight of Hindu population than Nepal.

Supposing that only all the tourists that visited Muslim majority countries (World Tourism Organization, 2014) consumed wine, then the figures calculated by dividing the whole country's wine consumption by the total arrivals (i.e. tourists) would result in improbable data (very high wine consumption per capita) for some countries, e.g. Burkina Faso (58.9538 liters per capita), Azerbaijan (39.1304 liters per capita), Algeria (29.1951 liters per capita), Niger (16.1341 liters per capita), Tunisia (14.0672 liters per capita), Lebanon (13.8067 liters per capita), Gambia (11.4076 liters per capita), Sierra Leone (9.56 liters per capita), Comoros (7.7660 liters per capita), Senegal (6.7915 liters per capita), Albania (6.0899 liters per capita), Kazakhstan (5.8089 liters per capita), Kyrgyzstan (4.7976 liters per capita), Morocco (4.0488 liters per capita), if one takes into account the tourists' short stay.

For the Buddhist majority countries, the tourists' wine consumption level was slightly higher than the country's wine consumption, i.e. Laos (0.1330 against 0.0667 liters per capita), Cambodia (0.4528 against 0.1092 liters per capita), Thailand (0.7037 against 0.2355 liters per capita), etc. But there is one exception, i.e. Mongolia (4.6074 against 1.0281 liters per capita). In the case of the Hindu majority countries, in both Nepal and India the tourists' wine consumption level was considerably higher than the country's wine consumption, i.e. 0.7609 against 0.0222 liters per capita, and 2.1739 against 0.0116 liters per capita, respectively.

It is obvious that some Muslim, Buddhist and Hindu people in the Muslim majority countries consume wine because, by assuming that only their Christian, Unaffiliated, Folk Religion, Jewish, and other religion populations consume wine and calculating for this population the wine consumption per capita by dividing the whole country's wine consumption by the total number of Christian, Unaffiliated, Folk Religion, Jewish, and other religion population, unrealistic data were obtained, e.g. Morocco (1,223 liters per capita), Tunisia (1,553 liter per capita), Maldives (479 liters per capita), Algeria (95 liters per capita), Azerbaijan (337 liters per capita), Uzbekistan (112 liters per capita), etc. These values are much higher than the world highest level of wine consumption per capita, i.e. 57.4089 liters per capita.

Applying the same principle for the Buddhist majority countries, similar data were obtained but only for four countries with a high gap versus the initial level, i.e. Cambodia (9.9259 against 0.1092 liters per capita), Thailand (18.1178 against 0.2355 liters per capita), Bhutan (1.5637 against 0.0391 liters per capita), and Singapore (12.3094 against 5.7362 liters per capita). An identical situation occurred in the case of the Hindu majority countries, Nepal

(0.5054 against 0.0222 liters per capita), India (0.2182 against 0.0116 liters per capita), and Mauritius (7.3937 against 19889 liters per capita).

The differences between countries with the same majority religion population (Muslim, Buddhist or Hindu) related to wine consumption are explained by the importance of religion in the country's cultural model and the way it is understood and practiced by each person.

As for future research, it can focus on identifying some other correlation between a country's cultural model and the consumption of different food products as well as on analyzing the data by using additional statistical methods.

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Appendix 1. Grape-bearing areas, grape production, wine production, wine consumption, population figures, Muslim, Buddhist and Hindu population figures, and wine consumer expenditure by country in 2012

Country	Grape-bearing Areas (ha)	Grape Production (tonnes)	Wine Production (liters)	Wine Consumption (liters)	Population Figure	M*	B*	H*	Wine Consumption (liters per capita)	Wine Consumer Expenditure (US\$ per capita)
						(% of country's population)				
Afghanistan	61,690	590,065	n/a	149,000	29,824,536	99.7	0.1	0.1	0.0050	n/a
Albania	10,000	197,000	17,000,000	21,400,000	2,801,681	80.3	0.1	0.1	7.6383	n/a
Algeria	68,669	543,169	75,000,000	76,900,000	38,481,705	97.9	0.1	0.1	1.9984	3.49
Argentina	220,000	2,800,000	1,177,800,000	964,000,000	41,086,927	1.0	0.1	0.1	23.4625	67.97
Armenia	15,723	241,429	5,000,000	26,300,000	2,969,081	0.1	0.1	0.1	8.8580	n/a
Australia	148,489	1,656,621	1,155,000,000	521,400,000	22,723,900	2.4	2.7	1.4	22.9450	218.9
Austria	43,615	287,301	281,500,000	262,000,000	8,429,991	5.4	0.2	0.1	31.0795	106.22
Azerbaijan	12,443	150,987	5,000,000	97,200,000	9,295,784	96.9	0.1	0.1	10.4564	2.04
Bahrain	47	145	n/a	871,000	1,317,827	70.3	2.5	9.8	0.6609	n/a
Belarus	1,200	7,000	13,000,000	63,200,000	9,464,000	0.2	0.1	0.1	6.6779	58.76
Belgium	10	100	2,892,926	250,500,000	11,128,246	5.9	0.2	0.1	22.5103	252.25
Bolivia	4,300	28,000	7,000,000	9,500,000	10,496,285	0.1	0.1	0.1	0.9051	0.93
Bosnia and Herzegovina	5,500	25,931	5,000,000	49,500,000	3,833,916	45.2	0.1	0.1	12.9111	n/a
Brazil	82,603	1,514,768	194,000,000	382,000,000	198,656,019	0.1	0.1	0.1	1.9229	12.15
Bulgaria	77,341	260,673	123,600,000	142,000,000	7,305,888	13.7	0.1	0.1	19.4364	17.91
Canada	11,308	94,541	65,500,000	428,800,000	34,754,312	2.1	0.8	1.4	12.3380	176.6
Chile	204,000	3,200,000	1,001,000,000	248,400,000	17,464,814	0.1	0.1	0.1	14.2229	38.47
China	600,000	9,600,000	1,381,600,000	1,773,700,000	1,350,695,000	1.8	18.2	0.1	1.3132	1.23
Colombia	2,313	24,701	n/a	16,227,000	47,704,427	0.1	0.1	0.1	0.3402	5.28
Congo, Dem. Rep.	n/a	n/a	n/a	2,962,000	65,705,093	1.5	0.1	0.1	0.0451	n/a
Croatia	29,300	183,500	183,500,000	190,800,000	4,267,558	1.4	0.1	0.1	44.7094	65.64
Cuba	1,700	22,000	12,525,240	5,885,000	11,270,957	0.1	0.1	0.2	0.5221	n/a
Cyprus	9,262	47,006	8,400,000	15,900,000	1,128,994	25.3	0.2	0.1	14.0833	n/a
Czech	15,667	59,990	65,000,000	199,400,000	10,510,785	0.1	0.1	0.1	18.9710	89.24
Denmark	n/a	n/a	n/a	67,722,000	5,591,572	4.1	0.2	0.4	12.1114	242.78
Ecuador	62	400	n/a	5,154,000	15,492,264	0.1	0.1	0.1	0.3327	0.85
Egypt	66,262	1,378,815	3,000,000	2,000,000	80,721,874	94.9	0.1	0.1	0.0248	0.21
Estonia	n/a	n/a	n/a	3,731,000	1,325,016	0.2	0.1	0.1	2.8158	115.08
Ethiopia	2,200	5,000	1,264,898	616,000	91,728,849	34.6	0.1	0.1	0.0067	n/a
Finland	n/a	n/a	n/a	23,897,000	5,413,971	0.8	0.1	0.1	4.4140	217.27
France	760,805	5,338,512	4,047,700,000	2,900,000,000	65,676,758	7.5	0.5	0.1	44.1557	206.66
Georgia	45,000	144,000	95,000,000	75,900,000	4,490,700	10.7	0.1	0.1	16.9016	n/a
Germany	99,584	1,225,950	890,300,000	1,950,000,000	80,425,823	5.8	0.3	0.1	24.2459	122.22
Greece	99,200	978,200	315,000,000	303,100,000	11,092,771	5.3	0.1	0.1	27.3241	90.35
Guatemala	2,700	18,500	n/a	2,720,000	15,082,831	0.1	0.1	0.1	0.1803	n/a
Honduras	42	182	n/a	1,256,000	7,935,846	0.1	0.1	0.1	0.1583	n/a
Hong Kong	n/a	n/a	n/a	66,398,000	7,154,600	1.8	13.2	0.4	9.2805	40.27
Hungary	72,324	356,363	187,400,000	201,000,000	9,920,362	0.1	0.1	0.1	20.2614	74.86
India	112,000	1,240,000	11,500,000	14,300,000	1,236,686,732	14.4	0.8	79.5	0.0116	0.05
Indonesia	n/a	n/a	n/a	2,783,000	246,864,191	87.2	0.7	1.7	0.0113	0.16
Iran	215,000	2,150,000	n/a	30,000	76,424,443	99.5	0.1	0.1	0.0004	n/a
Iraq	11,000	226,718	n/a	425,000	32,578,209	99.0	0.1	0.1	0.0130	n/a
Ireland	n/a	n/a	n/a	25,601,000	4,586,897	1.1	0.2	0.2	5.5813	193.22
Israel	7,780	93,989	27,000,000	27,000,000	7,910,500	18.6	0.3	0.1	3.4132	34.77
Italy	696,756	5,819,010	4,082,900,000	2,300,000,000	59,539,717	3.7	0.2	0.1	38.6297	113.65
Japan	17,600	198,300	80,000,000	347,900,000	127,561,489	0.2	36.2	0.1	2.7273	33.62
Jordan	3,952	35,688	656,565	498,000	6,318,000	97.2	0.4	0.1	0.0788	0.02
Kazakhstan	10,000	71,700	20,000,000	35,800,000	16,791,425	70.4	0.2	0.1	2.1320	6.57
Kuwait	44	45	n/a	36,000	3,250,496	74.1	2.8	8.5	0.0111	n/a
Kyrgyzstan	5,498	7,850	2,000,000	11,543,000	5,607,200	88.0	0.1	0.1	2.0586	n/a
Latvia	n/a	n/a	n/a	57,760,000	2,034,319	0.1	0.1	0.1	28.3928	158.45
Lebanon	10,500	92,000	15,000,000	18,860,000	4,424,888	61.3	0.2	0.1	4.2623	n/a
Libya	8,300	33,000	n/a	438,000	6,154,623	96.6	0.3	0.1	0.0712	n/a

AN ANALYSIS OF THE RELATION BETWEEN WINE CONSUMPTION AND CULTURAL MODELS

Country	Grape-bearing Areas (ha)	Grape Production (tonnes)	Wine Production (liters)	Wine Consumption (liters)	Population Figure	M*	B*	H*	Wine Consumption (liters per capita)	Wine Consumer Expenditure (US\$ per capita)
						(% of country's population)				
Liechtenstein	n/a	195	60,606	135,000	36,656	5.0	0.1	0.1	3.6829	n/a
Lithuania	n/a	n/a	n/a	357,000	2,987,773	0.1	0.1	0.1	0.1195	118.32
Luxembourg	1,223	11,318	13,200,000	4,836,000	530,946	2.3	0.1	0.1	9.1083	n/a
Macedonia	20,948	240,461	82,000,000	86,500,000	2,105,575	39.3	0.1	0.1	41.0814	n/a
Madagascar	2,500	13,000	9,000,000	11,300,000	22,293,914	3.0	0.1	0.1	0.5069	n/a
Malaysia	n/a	n/a	n/a	4,500,000	29,239,927	63.7	17.7	6	0.1539	6.25
Malta	1,620	4,555	4,000,000	9,700,000	419,455	0.2	0.1	0.2	23.1252	n/a
Mexico	26,915	375,298	102,000,000	149,900,000	120,847,477	0.1	0.1	0.1	1.2404	6.49
Moldova	129,351	505,917	385,000,000	39,500,000	3,559,519	0.6	0.1	0.1	11.0970	n/a
Montenegro	8,500	38,861	16,161,600	9,138,000	621,081	18.7	0.1	0.1	14.7131	11.29
Morocco	45,015	341,902	37,000,000	39,800,000	32,521,143	99.9	0.1	0.1	1.2238	1.67
Namibia	5,800	23,000	n/a	102,000	2,259,393	0.3	0.1	0.1	0.0451	n/a
Netherlands	200	1,200	n/a	356,000,000	16,754,962	6.0	0.2	0.5	21.2474	121.46
New Zealand	34,605	340,000	215,000,000	73,600,000	4,433,300	1.2	1.6	2.1	16.6028	156.21
Nigeria	n/a	n/a	n/a	39,360,000	168,833,776	48.8	0.1	0.1	0.2331	0.41
Norway	n/a	n/a	n/a	82,404,000	5,018,573	3.7	0.6	0.5	16.4198	294.46
Occupied Palestinian Territory	2,200	16,000	n/a	0	4,219,000	97.6	0.1	0.1	0.0000	n/a
Pakistan	15,600	63,500	n/a	71,000	179,160,111	96.4	0.1	1.9	0.0004	n/a
Paraguay	349	1,936	6,000,000	22,800,000	6,687,361	0.1	0.1	0.1	3.4094	n/a
Peru	18,483	365,114	66,000,000	63,200,000	29,987,800	0.1	0.2	0.1	2.1075	30.19
Philippines	370	169	n/a	9,920,000	96,706,764	5.5	0.1	0.1	0.1026	0.4
Poland	n/a	n/a	n/a	81,000	38,535,873	0.1	0.1	0.1	0.0021	41.15
Portugal	179,500	839,500	585,700,000	441,300,000	10,514,844	0.6	0.6	0.1	41.9692	130.52
Qatar	3	8	n/a	1,671,000	2,050,514	67.7	3.1	13.8	0.8149	n/a
Réunion	30	240	30,303	0	865,000	4.2	0.2	4.5	0.0000	n/a
Romania	177,661	746,385	405,900,000	524,000,000	20,076,727	0.3	0.1	0.1	26.0999	27.92
Russia	46,100	266,790	620,000,000	1,186,000,000	143,178,000	10.0	0.1	0.1	8.2834	67.03
Saudi Arabia	14,300	150,000	n/a	81,000	28,287,855	93.0	0.3	1.1	0.0029	n/a
Serbia	41,000	263,419	219,699,780	105,700,000	7,199,077	4.2	0.1	0.1	14.6824	23.21
Singapore	n/a	n/a	n/a	30,473,000	5,312,400	14.3	33.9	5.2	5.7362	42.27
Sint Maarten (Dutch part)	n/a	n/a	213,000	2,244,000	39,088	0.2	0.5	0.2	57.4089	n/a
Slovakia	10,492	52,209	36,900,000	84,200,000	5,407,579	0.2	0.1	0.1	15.5707	66.53
Slovenia	16,351	92,324	85,000,000	86,400,000	2,057,159	3.6	0.1	0.1	41.9997	50.55
South Africa	124,000	1,839,030	1,086,500,000	359,800,000	52,274,945	1.7	0.2	1.1	6.8828	26.2
South Korea	17,181	277,917	12,500,000	32,200,000	50,004,441	0.2	22.9	0.1	0.6439	20.32
Spain	943,000	5,238,300	3,150,000,000	1,010,000,000	46,761,264	2.1	0.1	0.1	21.5991	59.74
Sweden	n/a	n/a	n/a	62,769,000	9,519,374	4.6	0.4	0.2	6.5938	272.52
Switzerland	14,920	127,153	110,500,000	309,600,000	7,996,861	5.5	0.4	0.4	38.7152	502.78
Syria	45,000	325,000	85,859	24,000	22,399,254	92.8	0.1	0.1	0.0011	n/a
Taiwan	2,800	99,267	n/a	18,603,000	23,272,000	0.1	21.3	0.1	0.7994	35.25
Tajikistan	36,000	167,101	6,000,000	10,000	8,008,990	96.7	0.1	0.1	0.0012	n/a
Tanzania	3,600	18,000	n/a	4,286,000	47,783,107	35.2	0.1	0.1	0.0897	n/a
Thailand	4,500	80,000	n/a	15,730,000	66,785,001	5.5	93.2	0.1	0.2355	3.46
Tunisia	30,000	115,000	28,000,000	83,700,000	10,777,500	99.5	0.1	0.1	7.7662	1.97
Turkey	462,296	4,275,659	14,000,000	14,100,000	73,997,128	98.0	0.1	0.1	0.1905	0.32
Turkmenistan	18,500	240,000	18,000,000	4,549,000	5,172,931	93.0	0.1	0.1	0.8794	5.1
Ukraine	67,900	456,000	215,000,000	206,800,000	45,593,300	1.2	0.1	0.1	4.5358	19.08
United Arab Emirates	20	55	n/a	18,006,000	9,205,651	76.9	2.0	6.6	1.9560	1.99
United Kingdom	640	1,000	2,300,000	1,273,000,000	63,695,687	4.4	0.4	1.3	19.9857	183.56
United States	389,349	6,661,820	2,760,400,000	3,269,238,000	313,873,685	0.9	1.2	0.6	10.4158	84.84
Uruguay	8,000	130,000	110,900,000	93,400,000	3,395,253	0.1	0.1	0.1	27.5090	n/a
Uzbekistan	115,000	1,120,000	25,000,000	110,200,000	29,774,500	96.7	0.1	0.1	3.7012	n/a
Venezuela	1,100	20,000	n/a	17,224,000	29,954,782	0.3	0.1	0.1	0.5750	6.43
Vietnam	740	15,308	n/a	12,490,000	88,772,900	0.2	16.4	0.1	0.1407	0.22
Yemen	13,532	154,869	n/a	10,000	23,852,409	99.1	0.1	0.6	0.0004	n/a
Zimbabwe	390	3,200	3,030,300	5,258,000	13,724,317	0.9	0.1	0.1	0.3831	n/a
Bangladesh	n/a	n/a	n/a	77,000	154,695,368	89.8	0.5	9.1	0.0005	n/a

Country	Grape-bearing Areas (ha)	Grape Production (tonnes)	Wine Production (liters)	Wine Consumption (liters)	Population Figure	M*	B*	H*	Wine Consumption (liters per capita)	Wine Consumer Expenditure (US\$ per capita)
						(% of country's population)				
Benin	n/a	n/a	n/a	5,882,000	10,050,702	23.8	0.1	0.1	0.5852	n/a
Bhutan	n/a	n/a	n/a	29,000	741,822	0.2	74.7	22.6	0.0391	n/a
Brunei	n/a	n/a	n/a	57,000	412,238	75.1	8.6	0.3	0.1383	n/a
Burkina Faso	n/a	n/a	n/a	14,031,000	16,460,141	61.6	0.1	0.1	0.8524	n/a
Burma (Myanmar)	n/a	n/a	n/a	688,000	52,797,319	4.0	80.1	1.7	0.0130	n/a
Cambodia	n/a	n/a	n/a	1,623,000	14,864,646	2.0	96.9	0.1	0.1092	n/a
Cameroon	n/a	n/a	n/a	10,987,000	21,699,631	18.3	0.1	0.1	0.5063	n/a
Central African Republic	n/a	n/a	n/a	294,000	4,525,209	8.5	0.1	0.1	0.0650	n/a
Chad	n/a	n/a	n/a	1,978,000	12,448,175	55.3	0.1	0.1	0.1589	n/a
Comoros	n/a	n/a	n/a	146,000	717,503	98.3	0.1	0.1	0.2035	n/a
Cote d'Ivoire	n/a	n/a	n/a	28,552,000	19,839,750	37.5	0.1	0.1	1.4391	n/a
Djibouti	n/a	n/a	n/a	532,000	859,652	96.9	0.1	0.1	0.6189	n/a
Fiji	n/a	n/a	n/a	1,150,000	874,742	6.3	0.1	27.9	1.3147	n/a
Gabon	n/a	n/a	n/a	7,576,000	1,632,572	11.2	0.1	0.1	4.6405	n/a
Gambia	n/a	n/a	n/a	1,791,000	1,791,225	95.1	0.1	0.1	0.9999	n/a
Ghana	n/a	n/a	n/a	30,657,000	25,366,462	15.8	0.1	0.1	1.2086	n/a
Guinea	n/a	n/a	n/a	1,298,000	11,451,273	84.4	0.1	0.1	0.1133	n/a
Guinea Bissau	n/a	n/a	n/a	7,101,000	1,663,558	45.1	0.1	0.1	4.2686	n/a
Guyana	n/a	n/a	n/a	81,000	795,369	6.4	0.1	24.9	0.1018	n/a
Kenya	n/a	n/a	n/a	6,607,000	43,178,141	9.7	0.1	0.1	0.1530	n/a
Kosovo	n/a	n/a	n/a	343,000	1,807,106	87.0	0.1	0.1	0.1898	n/a
Laos	n/a	n/a	n/a	443,000	6,645,827	0.1	66.0	0.1	0.0667	n/a
Liberia	n/a	n/a	n/a	616,000	4,190,435	12.0	0.1	0.1	0.1470	n/a
Macao	n/a	n/a	n/a	7,189,000	556,783	0.2	17.3	0.1	12.9117	n/a
Malawi	n/a	n/a	n/a	1,090,000	15,906,483	13.0	0.1	0.1	0.0685	n/a
Maldives	n/a	n/a	n/a	1,137,000	338,442	98.4	0.6	0.3	3.3595	n/a
Mali	n/a	n/a	n/a	543,000	14,853,572	92.4	0.1	0.1	0.0366	n/a
Mauritania	n/a	n/a	n/a	29,000	3,796,141	99.1	0.1	0.1	0.0076	n/a
Mauritius	n/a	n/a	n/a	2,568,000	1,291,167	16.7	0.1	56.4	1.9889	n/a
Mongolia	n/a	n/a	n/a	2,875,000	2,796,484	3.2	55.1	0.1	1.0281	n/a
Mozambique	n/a	n/a	n/a	12,059,000	25,203,395	18.0	0.1	0.1	0.4785	n/a
Nepal	n/a	n/a	n/a	611,000	27,474,377	4.6	10.3	80.7	0.0222	n/a
Niger	n/a	n/a	n/a	1,323,000	17,157,042	98.4	0.1	0.1	0.0771	n/a
Oman	n/a	n/a	n/a	533,000	3,314,001	85.9	0.8	5.5	0.1608	n/a
Senegal	n/a	n/a	n/a	6,839,000	13,726,021	96.4	0.1	0.1	0.4983	n/a
Sierra Leone	n/a	n/a	n/a	717,000	5,978,727	78.0	0.1	0.1	0.1199	n/a
Sri Lanka	n/a	n/a	n/a	1,103,000	20,328,000	9.8	69.3	13.6	0.0543	n/a
Sudan	n/a	n/a	n/a	87,000	37,195,349	90.7	0.1	0.1	0.0023	n/a
Suriname	n/a	n/a	n/a	381,000	534,541	15.2	0.6	19.8	0.7128	n/a
Togo	n/a	n/a	n/a	12,053,000	6,642,928	14.0	0.1	0.1	1.8144	n/a
Trinidad and Tobago	n/a	n/a	n/a	1,223,000	1,337,439	5.9	0.3	22.7	0.9144	n/a
Uganda	n/a	n/a	n/a	1,005,000	36,345,860	11.5	0.1	0.3	0.0277	n/a

Source: Food and Agriculture Organization of the United Nations Statistics Division, 2012a, 2012b, 2012c, 2012d; The Wine Institute, 2012a, 2012b; The World Bank, 2015; USDA, 2012; Euromonitor International Ltd., 2013b, p. 119; Pew Research Center, The Pew Forum on Religion & Public Life, 2012, pp. 45-50, and author's own calculation based on data in The Wine Institute, 2012b, and The World Bank, 2015.

*M - Muslim Population Figure; B - Buddhist Population Figure; H - Hindu Population Figure.

Note: The following formula was used to convert tonnes in liters for wine production according to different sources used (Stoker, 2013, p. 43; FAO/INFOODS Databases, 2012,

p. 9):
$$\text{liters (ml)} = \text{tonnes (t)} \cdot \frac{1 (\text{ml})}{0.99 (\text{t})}$$

Appendix 2. Weight of wine consumer expenditure in the alcoholic beverages consumer expenditure and in disposable income in 2011

Country	Weight of wine consumer expenditure in:		Country	Weight of wine consumer expenditure in:	
	Alcoholic Beverages Expenditure (%)	Disposable Income (%)		Alcoholic Beverages Expenditure (%)	Disposable Income (%)
Algeria	47.03	0.193	Lithuania	15.19	0.658
Argentina	45.41	1.024	Malaysia	20.55	0.106
Australia	34.85	0.629	Mexico	5.45	0.093
Austria	31.42	0.391	Morocco	23.66	0.081
Azerbaijan	13.24	0.068	Netherlands	48.08	0.563
Belarus	25.50	1.114	New Zealand	37.15	0.779
Belgium	68.95	0.946	Nigeria	10.44	0.042
Bolivia	3.98	0.056	Norway	36.49	0.671
Brazil	20.45	0.165	Pakistan	0.00	0.000
Bulgaria	11.45	0.308	Peru	13.28	0.737
Canada	32.08	0.594	Philippines	21.28	0.142
Chile	27.41	0.426	Poland	27.57	0.909
China	11.80	0.036	Portugal	69.37	0.809
Colombia	3.10	0.072	Romania	23.46	0.651
Croatia	46.24	0.849	Russia	18.09	0.856
Czech	19.84	0.883	Saudi Arabia	n/a	n/a
Denmark	54.81	0.881	Singapore	36.26	0.152
Ecuador	4.67	0.023	Slovakia	26.53	0.635
Egypt	6.29	0.008	Slovenia	25.63	0.343
Estonia	28.07	1.392	South Africa	16.35	0.590
Finland	26.17	0.799	South Korea	17.69	0.155
France	58.88	0.750	Spain	44.23	0.308
Germany	37.31	0.439	Sweden	49.15	0.995
Greece	38.07	0.332	Switzerland	78.18	1.092
Hong Kong	34.69	0.137	Taiwan	27.44	0.254
Hungary	28.42	1.453	Thailand	2.92	0.095
India	0.56	0.003	Tunisia	53.49	0.066
Indonesia	5.19	0.005	Turkey	2.76	0.005
Ireland	36.82	0.836	Turkmenistan	16.46	0.203
Israel	27.17	0.188	Ukraine	17.47	0.614
Italy	69.87	0.460	United Arab Emirates	25.42	0.007
Japan	5.23	0.100	United Kingdom	47.87	0.740
Jordan	4.22	0.079	United States	23.21	0.242
Kazakhstan	11.08	0.129	Venezuela	3.19	0.087
Kuwait	n/a	n/a	Vietnam	4.45	0.042
Latvia	30.66	1.524	-	-	-

Source: Author's own calculation based on data from Euromonitor International Ltd., 2013a, p. 77, 183.

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