



**Universitat de les
Illes Balears**

Facultat d'Economia i Empresa

Memòria del Treball de Fi de Grau

Wine sector in the Balearic Islands. Evolution and perspectives.

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Grau de Administració d'Empreses

Any acadèmic 2017-18

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wine, balearic, evolution, perspectives

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1. Introduction

1.1 What do we understand as winery sector?

According to the Oxford dictionary (2018), the word Wine refers to *“An alcoholic drink made from fermented grape juice”*. If we check the definition of the European Parliament (Regulation (EC) No 882/2004), this term is referred to a *“product obtained exclusively from the total or partial alcoholic fermentation of fresh grapes, whether or not crushed, or of grape must”*.

According to the Diccionario de la Real Academia Española (2017), the word *Vitivinicultura* (vitiviniculture) means: *“Conjunto de técnicas y conocimientos relativos al cultivo de la vid y a la elaboración del vino.”* (Combination of techniques and knowledge related to the vineyard plantation and wine elaboration process)

In the winery sector there is a broad variety of wines to choose from. Wine can be classified depending on its aging (the time that the grape has been in fermentation), depending on its colour, its residual sugar content, and its alcoholic content. When we analyse each classification more deeply, we can find the following brandings:

- According to Aging: Wine can be classified from younger to older into Crianza, Reserva and Gran Reserva, according to the timing they spend in the barrel and bottled.
- By colour: It depends on the grape used for its production and on the timing in which the skin of the grape and the must are in contact. We find red wine, white wine and rosée wine.
- According to the level of residual sugar content: it refers to the quantity of sugar that has not been processed into alcohol in the fermentation process. Wines can be classified into dry wines, semi-dry wines, semi-sweet, sweet and natural sweet wines.
- By their alcoholic content: Depending on the alcohol level, red wines can be classified into a 8-14% alcoholic content or a 14-23% alcoholic content (also called fortified wines), and the white wines into wines with a 8-11% or a 12% alcoholic content.

The winery sector is a value chain that starts with the harvest of the vineyard and the process of the grape, and finishes with the bottling and selling of the final product (Roca, 2016).

1.2. Relevance of the winery sector

The winery sector has been analysed by researchers such as Porter (2000), Rojas-Méndez et al. (2018), Rickard et al. (2018), Binimelis (2014), Oliver (2014), and even the European Commission (2014). In this paper we will analyse the empirical evidence available on the she sector, with a new perspective, the importance and evolution in the Balearic Islands.

The structure of the paper is as follows: after the introduction, the first section is referred to the history of wine, where we will check the historical background of this sector. On the second part, we will analyse the data of the current status of this industry on the world and in Spain. The third part is focused on the Balearic Island wine industry, its background and the description of it situation nowadays. The fourth topic is about the legal restrictions and classifications of the product. On the fifth section, we will explore the importance of applying sustainable practises on this industry. The sixth part is aimed to the analysis of the oenological tourism in Balearic Islands and the trends of alcoholic consumption. The paper finishes with a conclusion of all the studied topics and the references of the used information.

1.3. Objectives

The purpose of the study is threefold:

First, to analyze the economic importance of the wine industry at the international, national and Balearic level, using global economic data referred to the wine industry: imports/exports value, evolution of the production, share of the grape, among other statistics. Also, we will carry out a deeper analysis of the Spanish situation and the Balearic Islands case, and consider the forecasts for the next period. Second, we will also explore all the background of the topic, including a historical analysis on the origins and evolution of the wine industry over the world and in the Balearic territories; plus the legal requirements and policies implement in the industry at the EU, Spanish and Balearic level. Third, we will study the possibilities of the oenological tourism and some ways to combine sustainability with viticulture techniques.

1.4 Wine History. Origins

The first evidences that we have of vines plantations date back to 5000 B.C., on the Zagros mountains in Iran, where the explorers found a vessel with wine rests in form of red painting.

Probably, it has been one of the first alcoholic drink known by humans. Explorers have also found vineyard rests in the Caucasus river coast from 7.000 years ago, and even we can find more than 200 references about this drink in the Bible, the first one in the Old Testament.

Experts theories point out that the discovery and development of the wine industry could had been produced randomly due to the ease to ferment of the grapes, and the ease to adapt the vine.

When travelling around the world, we can see its presence all around the Mediterranean territories and Asia. However, the cultural expansion of wine started in Rome because Romans had the tradition of planting vines on the whole conquered territories, meanwhile in the Greek culture you will find a lot of references of wine on the *Iliad* (Homer, 8th century B.C.) and *Odyssey* (Homer, 7th century B.C.). For these two cultures this product was very important and had a God dedicated to it, Dionysus god for the Greeks and Baco's god for the Romans.

In Egypt we can find the first signs of concern about the quality of the wine, with the discovery of labelled vessels distinguishing among the different properties of the wine.

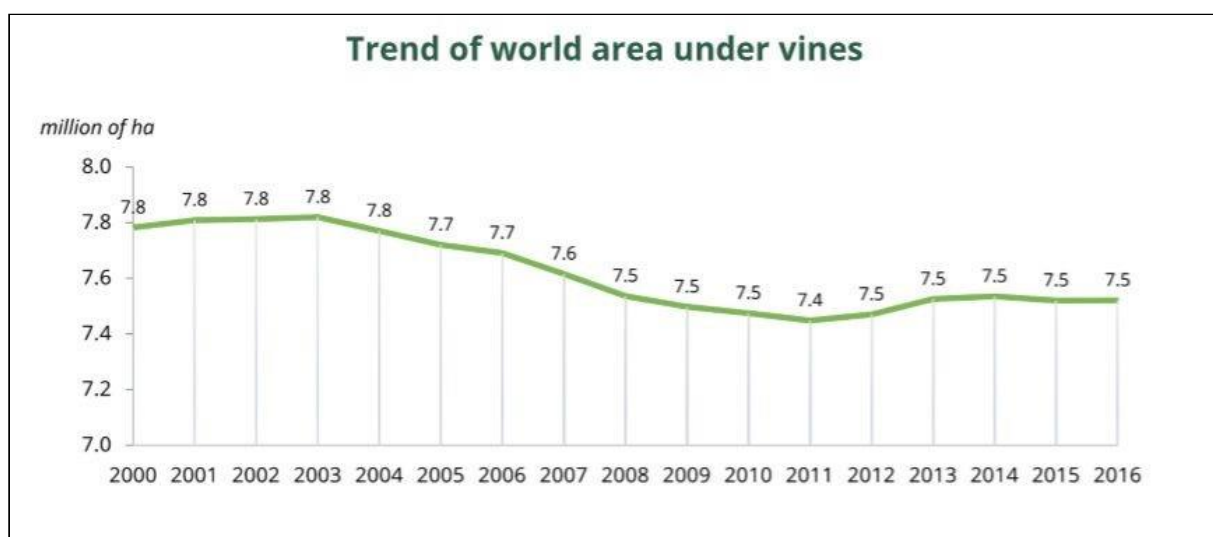
Christians were the ones who started to design improvements for the production systems, and it is known that the main producers in the Middle Ages were Spain, France and Italy. During that time, wine was a basic consumer good, due to hunger and the frequent periods of plagues. Its consumption provided calories and was a method of eliminating toxins. In fact, the first wine bottle found dates back to year 325 B.C, it came from Rome and was found in a German city called Speyer in 1867.

There is a category division of wines depending on the location of origin distinguishing between wines from the Old World and wines from the New World. The Old World producers are France, Germany, Italy, Portugal and Spain, meanwhile the New World producers are Australia, Argentina, Chile, New Zealand and South Africa.

2. Theoretical Background: Global current situation and development

According to the 2017 annual report prepared by the Statistics Department of the International Organisation of Vine and Wine (OIV, 2017), the total world area under vines in 2016 was 7,5 million of hectares and it is a constant value since 2012. However, it has experienced a considerably decrease since 2000, when the total world area was 7,8 million of hectares.

Figure 1. Evolution of vine areas (2000-2016).

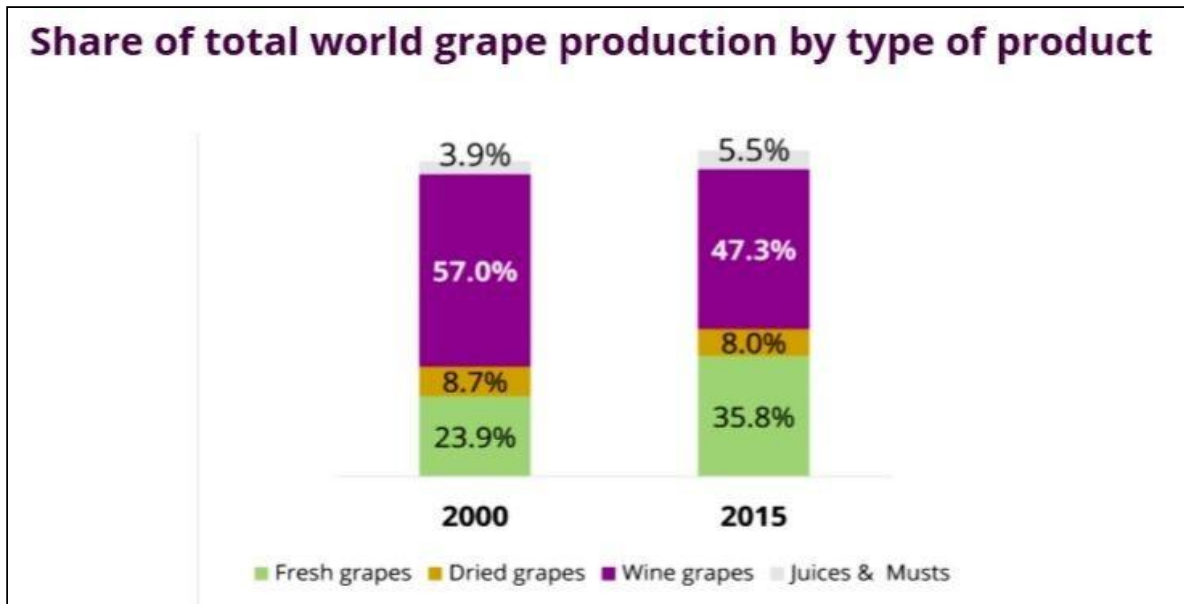


Source: OIV Statistical Report on World Vitiviniculture 2017. (OIV, 2017).

Five countries in the world represent a 50% of the total vineyard; Spain (14%), China (11%), France (10%), Italy (9%) and Turkey (7%). Meanwhile Spain and China have been constantly growing since 2012, the second one in a huge proportion with an increase of 141 thousand of hectares; France, Italy and Turkey have decreased their proportion of planted territories (OIV, 2017).

The global production of grapes in 2016 was 7,8 million of tons; a 39% came from Europe, a 34% from Asia and an 18% from America. However, not all the production of these vineyards is used by the winery industry. As we can observe in Figure 2, the production is divided between different types of products: fresh grapes, dried grapes, wine grapes, juices and musts. We find an increase of the production of fresh grapes, jukes and musts from 2000 to 2015, while a decrease in wine grapes and dried grapes (OIV, 2017).

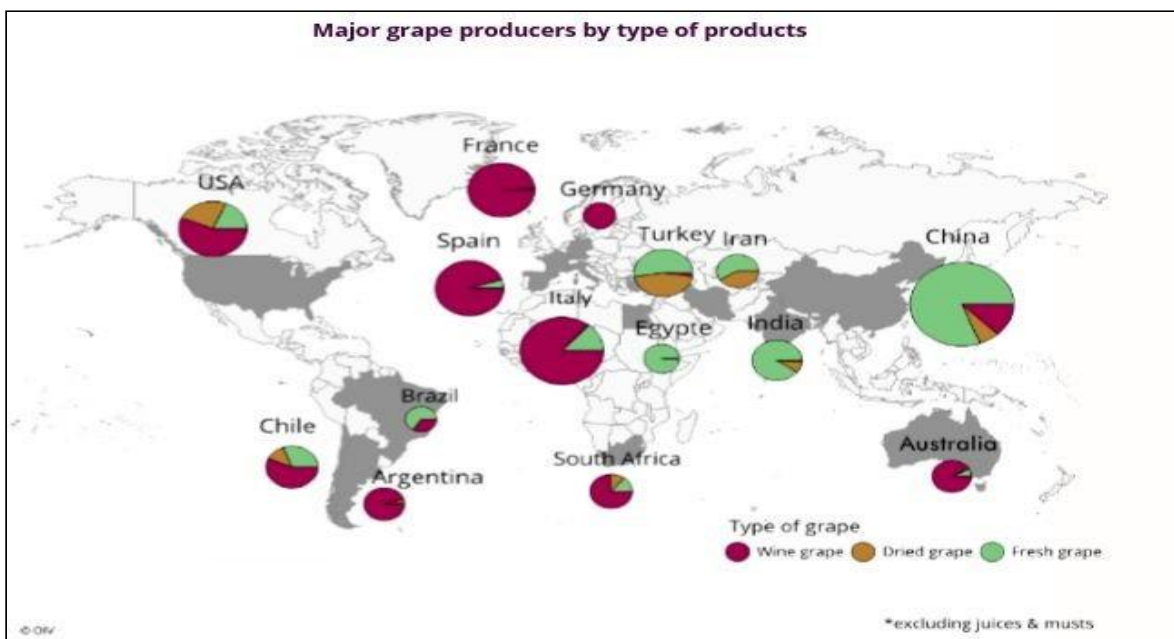
Figure 2. Share of total world grape production (2000-2015)



Source: OIV Statistical Report on World Vitiviniculture 2017 (OIV, 2017).

In Figure 3 we can observe the world distribution of major grape producers by type of product. As we can observe, in most of the Western countries and Southern countries, grape production is mostly focused on the wine production, meanwhile in the Eastern countries we see that the production is mostly focused on fresh grape.

Figure 3. Share of total world grape production (2000-2015)



Source: OIV Statistical Report on World Vitiviniculture 2017 (OIV, 2017).

Since 2000 the world wine production has been fluctuating from 257 million hectolitres to 290 million hectolitres. The 2016 forecast was 267 million of hectolitres. The top five wine producing countries are Italy, France, Spain, USA, Australia and China. We can see in Table 1 that the New World producers are achieving increases in production meanwhile Italy and France are experiencing a considerably decrease in production.

Table 1. Wine production in the world (2000-2016)

Wine production							2016/2015	2016/2015
<i>million of hl</i>	2012	2013	2014	2015 ^b	2016 ^c	Variation in volume	Variation in %	
Italy	45.6	54.0	44.2	50.0	50.9	0.9	2%	
France	41.5	42.1	46.5	47.0	43.5	-3.5	-7%	
Spain	31.1	45.3	39.5	37.7	39.3	1.7	4%	
USA ^d	21.7	24.4	23.1	21.7	23.9	2.2	10%	
Australia	12.3	12.3	11.9	11.9	13.0	1.1	9%	
China	13.5	11.8	11.6	11.5	11.4	-0.1	-1%	
South Africa	10.6	11.0	11.5	11.2	10.5	-0.7	-6%	
Chile	12.6	12.8	10.0	12.9	10.1	-2.7	-21%	
Argentina	11.8	15.0	15.2	13.4	9.4	-3.9	-29%	
Germany	9.0	8.4	9.2	8.9	9.0	0.1	1%	
Portugal	6.3	6.2	6.2	7.0	6.0	-1.0	-15%	
Russia	6.2	5.3	4.9	5.6	5.6	0.0	0%	
Romania	3.3	5.1	3.7	3.5	3.3	-0.3	-8%	
New Zealand	1.9	2.5	3.2	2.3	3.1	0.8	34%	
Greece	3.1	3.3	2.8	2.5	2.6	0.0	2%	
Serbia	2.2	2.3	2.3	2.3	2.3	0.0	0%	
Austria	2.1	2.4	2.0	2.3	2.0	-0.3	-14%	
Hungary	1.8	2.6	2.6	3.0	1.9	-1.2	-38%	
Moldova	1.5	2.6	1.6	1.7	1.7	0.0	0%	
Brazil	3.0	2.7	2.7	3.5	1.6	-1.9	-55%	
Bulgaria	1.3	1.7	0.7	1.3	1.2	-0.1	-8%	
Georgia	0.8	1.0	1.1	1.3	1.1	-0.2	-16%	
Switzerland	1.0	0.8	0.9	0.9	1.0	0.1	18%	
World	258	290	270	276	267	-9	-3%	

Sources: OIV, OIV Experts, Trade Press
a) Countries with a wine production of more than 1 mhl
b) 2015: provisional data
c) 2016: forecasted data
d) OIV estimate (USDA basis)

Source: OIV Statistical Report on World Vitiviniculture 2017 (OIV, 2017).

Table 2 and Table 3 gather the information on wine trade (exports and imports). When we analyse the figures of wine trade, in terms of volume and in terms of value. In both cases, trade trends have been increasing since 2000 from a volume of 60 million of hectolitres traded to 104 million hectolitres in 2016, and in terms of value from 12 billion of EUR in 2000 to 29 billion EUR in 2016.

If we check the differences between the type of product (sparkling, bottled and bulk) since 2012 we can observe a remarkable variation in sparkling with an increase in volume and value of 26% and 23% respectively. On the other hand, bottled type has

suffered a decrease of 2% in terms of volume while a 14% increase in terms on value; and bulk type has barely changed (OIV, 2017).

- Exports

Table 2 contains a comparison in exports trends in value and volume from 2012 to 2016. As we can observe, Spain leads the exports ranking in terms of volume in 2016, with a 10.6% increase during the period 2012-2016, followed by Italy and France with a negative growth of 2,8% and 6,3% respectively. However, in terms of value we find a completely different panorama, in which France and Italy are above Spain with a wine exports of 8,2 and 5,6 billion of EUR and with a positive growth since 2012 of 5,3% and 19,8% respectively, meanwhile in Spain wine exports account for 2,6 billion of EUR in 2016, representing a positive growth of 9,1%.

Table 2. Wine exports around the world (2012-2016)

Exports in terms of volume in 2016						
million of hl	2012	2013	2014	2015	2016	2016/2012 Variation in %
Spain	20.7	18.4	23.0	24.7	22.9	10.6%
Italy	21.2	20.3	20.4	20.1	20.6	-2.8%
France	15.0	14.5	14.3	13.9	14.1	-6.3%
Chile	7.5	8.8	8.0	8.8	9.1	21.3%
Australia	7.2	7.1	7.0	7.4	7.5	3.3%
South Africa	4.2	5.3	4.2	4.2	4.3	2.7%
USA	4.0	4.1	4.0	4.2	3.8	-5.3%
Germany	4.0	4.0	3.9	3.7	3.6	-9.5%
Portugal	3.4	3.0	2.8	2.8	2.8	-18.2%
Argentina	3.7	3.1	2.6	2.7	2.6	-28.9%
New Zelande	1.8	1.8	1.9	2.1	2.1	18.8%
Moldova	1.2	1.2	1.2	1.2	1.2	0.0%
World	103	101	103	105	104	1%

Exports in terms of value in 2016						
billion of €	2012	2013	2014	2015	2016	2016/2012 Variation in %
France	7.8	7.8	7.7	8.3	8.2	5.3%
Italy	4.7	5.0	5.1	5.4	5.6	19.8%
Spain	2.4	2.6	2.5	2.6	2.6	9.1%
Chile	1.4	1.4	1.4	1.6	1.7	20.2%
Australia	1.5	1.3	1.3	1.5	1.5	1.4%
USA	1.1	1.2	1.1	1.4	1.4	31.4%
New Zealand	0.8	0.8	0.8	1.0	1.0	32.5%
Germany	1.0	1.0	1.0	1.0	0.9	-5.0%
Portugal	0.7	0.7	0.6	0.7	0.7	3.7%
Argentina	0.7	0.7	0.7	0.7	0.7	3.7%
Hong Kong	0.2	0.2	0.2	0.6	0.6	242.3%
South Africa	0.6	0.6	0.6	0.6	0.6	6.5%
World	25	26	26	28	29	14.3%

Source: MarketLine Industry Profile Wine in Spain.
(MarketLine, 2017)

The evolution observed in Table 2, leads us to think about the strategy followed by these countries, it seems that France and Italy are following a premium pricing strategy while Spain is focused on an economy of scale strategy. Also, French and Italian wines are very well-considered by consumers and due to this they involve higher prices and bigger earnings (Rojas-Méndez, Hine and Rod, 2017)

- Imports

Table 3 contains a comparison in imports trends in value and volume from 2012 to 2016.

Table 3. Wine imports around the world (2012-2016)

Imports in terms of volume in 2016						
million of hl	2012	2013	2014	2015	2016	2016/2012 Variation in %
Germany	15.4	15.3	15.4	15.3	14.5	-5%
UK	12.8	11.8	13.4	13.6	13.5	6%
USA	11.7	11.0	10.8	11.0	11.2	-4%
France	5.4	6.0	6.9	7.6	7.9	45%
China	3.9	3.8	3.8	5.6	6.4	62%
Canada	3.8	3.7	3.8	4.1	4.2	10%
Russia	4.9	4.9	4.7	4.0	4.0	-18%
Netherlands	4.0	3.6	3.8	3.8	3.8	-3%
Belgium	3.1	3.2	3.1	3.1	3.1	0%
Japan	2.6	2.6	2.7	2.8	2.7	4%
Sweden	2.0	2.1	2.3	2.2	2.2	7%
Switzerland	1.9	1.8	1.9	1.9	1.8	-3%
Denmark	1.9	2.0	1.9	1.8	1.8	-3%
Portugal	1.3	1.6	2.3	2.2	1.8	41%
Italy	2.8	2.7	2.8	2.8	1.7	-38%
Czech Republic	1.6	1.5	1.6	1.6	1.6	2%
Poland	1.0	1.0	1.1	1.1	1.2	23%
World	99	99	102	104	104	4.3%

Imports in terms of value in 2016						
billion of €	2012	2013	2014	2015	2016	2016/2012 Variation in %
USA	3.9	3.9	4.0	4.9	5.0	27%
UK	3.9	3.6	3.6	3.9	3.5	-10%
Germany	2.4	2.6	2.6	2.5	2.5	1%
China	1.2	1.2	1.1	1.8	2.1	74%
Canada	1.5	1.5	1.5	1.6	1.6	4%
Hong Kong	0.8	0.8	0.8	1.3	1.4	74%
Japan	1.2	1.2	1.2	1.3	1.3	12%
Switzerland	0.9	0.9	0.9	1.0	1.0	4%
Netherlands	0.9	0.9	1.0	1.0	0.9	6%
Belgium	1.0	1.0	1.0	1.0	0.9	-8%
France	0.6	0.6	0.6	0.7	0.7	18%
Russia	0.8	0.9	0.9	0.6	0.7	-19%
Sweden	0.5	0.6	0.6	0.6	0.6	17%
Denmark	0.5	0.5	0.5	0.6	0.6	10%
World	25	25	26	28	28	1.1%

Source: MarketLine Industry Profile Wine in Spain. (MarketLine, 2017)

As we can see in Table 3, in terms of volume the main importers are Germany, UK and USA. In 2016, UK was the top wine importer and experienced a 6% increase with respect to 2012, meanwhile Germany and USA experienced a decrease of 5% and 4% respectively. However, in terms of value USA was the top importer, followed by UK and Germany. This huge contrast when using the volume figures compared to the value figures, could be due to the fees that USA has to pay for importing EU wines (Rickard, Gergaud and Hu, 2014). The States had a 27% increase, whereas UK experienced a 10% decrease and Germany just a 1% increase.

2.1. Spanish current situation and development.

In order to understand the importance and role of Spain in the wine sector, we are going to use the data provided by the MarketLine Profile Industry of 2017 (2017). First, we are going to analyse the market in Spain and then we are going to develop a Porter's 5 forces analysis.

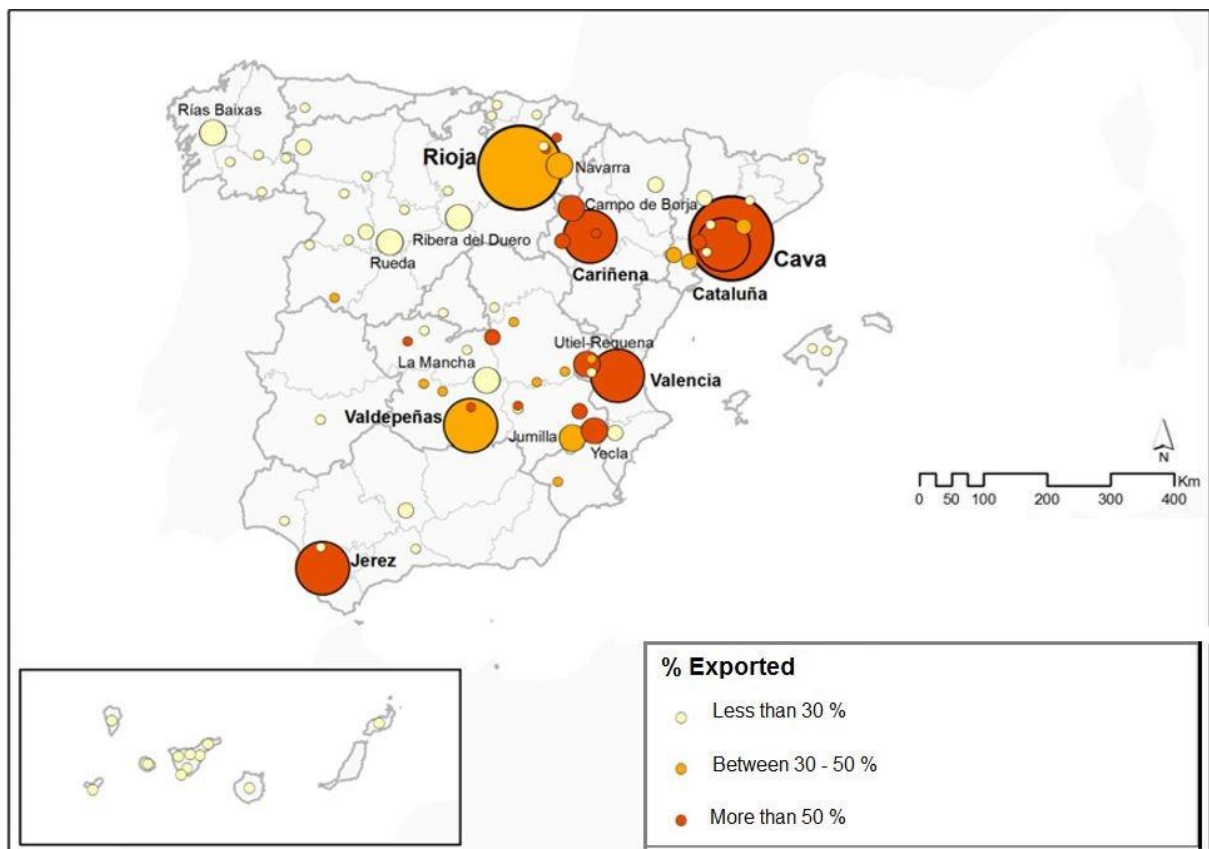
Market analysis of Spain

According to the data of the analysis of MarketLine (2017), the global evolution of the Spanish market has had a smooth growth since 2012 and the forecasts until 2021 point out that it will follow a similar trend. In 2016, Bodegas Peñasca, Vines of Vero, S.A., Bacardi Limited, Marques De Alella S.A. represent a 12.2% of the total market share. Bodegas Peñasca is the main winery with a 4% of market share.

Spain is one of the main wine exporters' countries of the world, as we have already seen, and it competes in different markets focusing in price or high quality. There are a high number of Denominación de Origen Protegida (DOP) brands in Spain, but the most demanded for exports are Rioja, Cava, Valencia, Cariñena, Jerez, Cataluña, Valdepeñas and La Mancha.

On the Figure 4 below, we will see the % of exportations of each DOP of the period 2014 – 2015.

Figure 4. DOP exports (2014 – 2015)



Source: Rodríguez (2017) Las Denominaciones de Origen Protegidas españolas de vino en los mercados globales. Own translation.

As we can see, although some regions have a bigger area it does not mean that its level of exportations would be higher than some locations with a smaller area, as we can see if we compare Rioja with Cariñena, for example.

High quality wine is basically focused to European market, specially to UK and Germany, although United States has an increasing paper as an importer country.

When analysing the most frequent distribution channels used in Spain, we can identify On Trade in the wineries or through salespersons, Food & drinks specialists,

Hypermarkets & Supermarkets and Convenience stores. The most important one is On Trade with a 37.1 % of market value (MarketLine, 2017).

As we have mentioned already, the forecasts indicate that the market won't experience any huge variation. In fact, a 0.6% compound annual growth in value is expected while in terms of volume, a -0.3% negative growth rate. This indicates that prices in the long term would increase, so there will be a compensation for the decrease in the volume of wine produced (MarketLine, 2017).

Porter's Five Forces Analysis

According to the article *The Five Competitive Forces That Shape Strategy* by Michael E. Porter on the Harvard Business Review (Porter, 2000), the five forces are the following ones:

- Threat of New Entrants:

It's the ease that the new competitors will have to achieve a significant market share in the industry, so the risk that they represent for the actual incumbents.

The entry barriers are an element that reduce the threat of new entrants. Some examples are: economies of scale, capital requirements, restrictive public policies.

- Threat of Substitute products or services:

It's the degree of availability of substitutes in the market, i.e., the degree in which your product can be substituted by an equal or similar product in the market. This is very related with the switching costs, that is how much would you spend in terms of price and effort in buying the competitor's product / service compared to how much would you spend in your product.

- Bargaining power of Suppliers:

It determines in which situation are the companies in the market, for instance, if they have a huge power it means that they can ask for higher prices or limit the quality of the services and products. It's normally produced in industries where there are not a lot of competitors and the buyers can't choose between a lot of alternatives, or when the first entrants to this market have become so powerful than the following ones haven't any chance to compete at the same level, because the customers have

a strong feeling/likeability for the first ones (we can compare it with the case of Apple users).

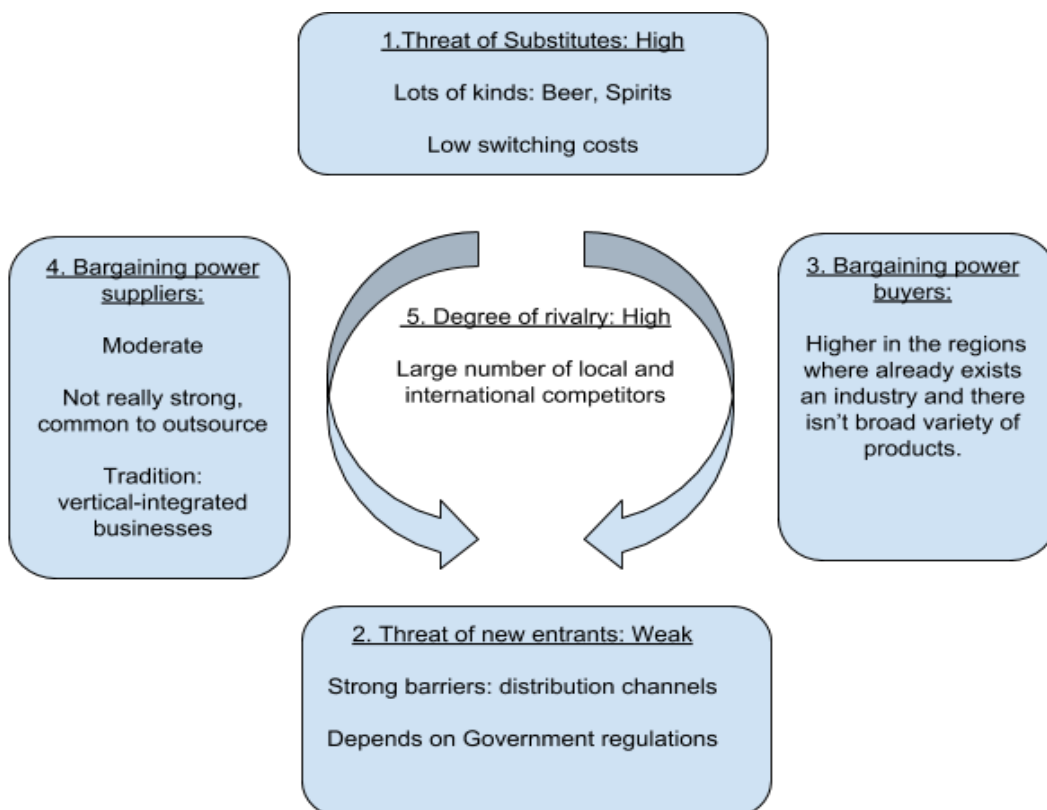
- Bargaining power of Buyers:

As in the previous case with the suppliers, when you have an industry where the power of buyers is high it implies that in this sector there are few competitors, few switching cost, the quality of the buyers have low importance, they purchase big amounts of product, between other facts.

- Degree of rivalry:

This factor it's produced by the combination of all the other forces. We perceive its intensity and basis (whether in terms of profitability or influence over the market) , and both of them will determine the industry potential. We have an industry with high level of rivalry when there are a lot of competitors, they all are really committed to the achievement of leadership on the market, and their products are barely the same. An example of this kind of industry could be the case of PepsiCo and Coca Cola.

Figure 5. Porter's Five Forces in the Wine Industry.



Source: Own elaboration based on MarketLine Industry Profile 2017 data.

1. Threat of substitutes (High): although it is really important the point of view and preferences of the customers, it is normal than the consumption of wine has place into restaurants and consumption of beers and spirits in bars. The main fact that produces this high threat is the low switching costs.
2. Threat of new entrants (Weak): in Spain the government regulations are not too strict compared with the one in other EU countries and wine is exempt from excise tax. The main barriers that a new business will face are: access to a good distribution channel and the fixed costs and factors that imply an economy of scale (production plant costs, reliable suppliers...). However, the likelihood of new entrants is weak nowadays.
3. Bargaining power of buyers: as we see in Figure 4, it is lower in the regions with a broad variety of products.
4. Bargaining power of suppliers: It presents a moderate level due to the market structure, where it is common among larger companies the outsourcing of resources and there is a strong tradition of vertical-integrated businesses.
5. Degree of rivalry: the low switching costs between products, high fixed production costs for the producers, the fragmented market and the fact that the major players are the ones who produce premium wines, leads to a really high degree of rivalry among the players.

3. The case of the Balearic Islands

3.1 Historical research

Olive oil and wine have been the main crops produced and exported in the agricultural and mercantile society of the *Kingdom of Mallorca*. Thanks to these crops, the Balearic Islands were the first agricultural region and the largest contributor compared with the other *Comunidades Autónomas* in Spain. Both were the main currencies in foreign trade on the XVII - XVIII centuries.

According to historians (e.g. Diodoro de Sicilia, 90 B.C.), Balearic vines date back to the Roman or Phoenician nation, it is known that before the colonisation of Quinto Cecilio Metelo in 123 B.C. there were not any vines in the area.

During the ancient ages, Eivissa was one of the main ports in the winery commerce, and they had a broad amphora industry.

From the X- XIII centuries period, there is little evidence about the evolution of the viticulture in the Balearic Islands, there is a reference from the 10th century (Al-zuhri, 1159) and the second one from 11th century (Martell, 1228). The first written reference dates back to 1150 and it belongs to a geographer called Al-Zuhri, who explained how Ibiza was the main exporter of raisins to Mallorca, and Menorca was full of vine plantations, who maintained this broad extension of plantations even after its conquest in 1231. The second one, was written by a merchant called Pere Martell in 1228, and shows a very different panorama in the Balearic Islands. Menorca had a lot of wine production comparing with other regions; Ibiza had developed a small wine production, and it is known than in Mallorca there is a location close to the mountain called Raiguer which is a wine producer.

After the conquest of Mallorca, Jaume I “The Conqueror” started some programs to extend the vine plantations and gave exploiting licenses subject to a tithe. The vine plantations were all concentrated in the city outskirts, and they extended to the valleys of Bunyola, Esporles, Alaró, Deià, Orient, Coanegra; among others. An important fact is the presence of aquifer and water spout systems, because viticulture was associated to irrigated land.

During the period from the XIV till the XV century, the importance of “urban wine” (produced in the city) started growing. According to Archivo Municipal de Palma (AMP) there was a register of the wine cellars existents in Palma, Alcúdia and Sineu in 1334, in the *Archivo del Real Patrimonio* , according to Villafranca in its “Misceláneas”. On it it was said that there were 156 wine cellars which were producing 543.258 litres of wine.

There are some documents dated back to the XV century, that point out the oriental origin of the grapevine called malvasia, one of the most used kind of grapes in the Balearic islands. This relation was established because Malvasía is also a Greek city in Morea.

During the next centuries (XVI - XVII), Mallorca vine plantations experienced a period of deterioration, in some part due to the devaluation of its products produced by the increasing importance in trade of the Valencian wine. However, in the XVII century, thanks to the policies of exemption of the tithe, there was an increase of the production. In the mid century there was an increase of supply that produced a decrease of the value of wine, and Mallorca became the main exporter of wine and the supplier of the Armada Española. From 1700 to 1720 the production grew by 50%. Also, in this period there was an increase of the demand and production of *aguardiente*, a distilled liquor cheaper than wine, due to the high temperatures of

summer that were killing the vines crops. Mallorca became an exporter of this kind of liquor, and its main customers were Barcelona and Geneva.

The geographical distribution of the wine production in Mallorca in the XVIII century was concentrated in three locations:

1. Wine vines in the mountains: high quality production using malvasia grapes, from 87.204 litres. Its advantage was the exemption of tithe.
2. Red wine in the other part of the Tramuntana Mountains.
3. *Aguardiente* in the East part of the island, with a total production of 8.660.850 litres.

The XIX-XX centuries had two key expansion moments, but it also was one of the worst periods for the agriculture in Mallorca, due to the phylloxera plague. The first moment of expansion was during the decade from 1870-1880 where there was an increase of the total ha of crops around the island because of the increase in the trade of French wine, which took place between the Cette port in France and the Palma and Portocolom ports in Mallorca.

However, phylloxera arrived on this time. The plague affected the whole Europe, and luckily, Mallorca was the last place which received this insect and could take advantage of it to made business. However, when the plague arrived it just last a few years to invade the whole island. In 1891, the first signs of phylloxera were discovered in Lluçmajor and started expanding over Mallorca. In 1892, Menorca was affected and the rest of Mallorca was invaded. Although, in 1909 we still don't have any register about Ibiza process of invasion.

To sum up, on the XIX century the three main disasters on the Mallorcan viticulture were:

1. Mallorca became importer of distilled alcohol on the XIX century. There was a wreck on the *aguardiente* production.
2. Almost extinction of malvasia kind, due to the hard competitiveness.
3. Phylloxera plague expanded all over the vine plantations.

On the other hand, the second moment of expansion was at the beginning of the XX century, when there was an increase of the planted land thanks to the Catholic union

movement. The wine industry received some incentives, such as a subsidy from the *Diputació*n consisting in some American vines, the creation of the *Estació*n *Enològica de Felanitx* (who was in charge of the creation of improvements of the cultivation systems and the increase of the production), and also the creation of the *Fundació Celler Cooperatiu de Felanitx* (who was responsible of facilitating the wine production and trade for producers).

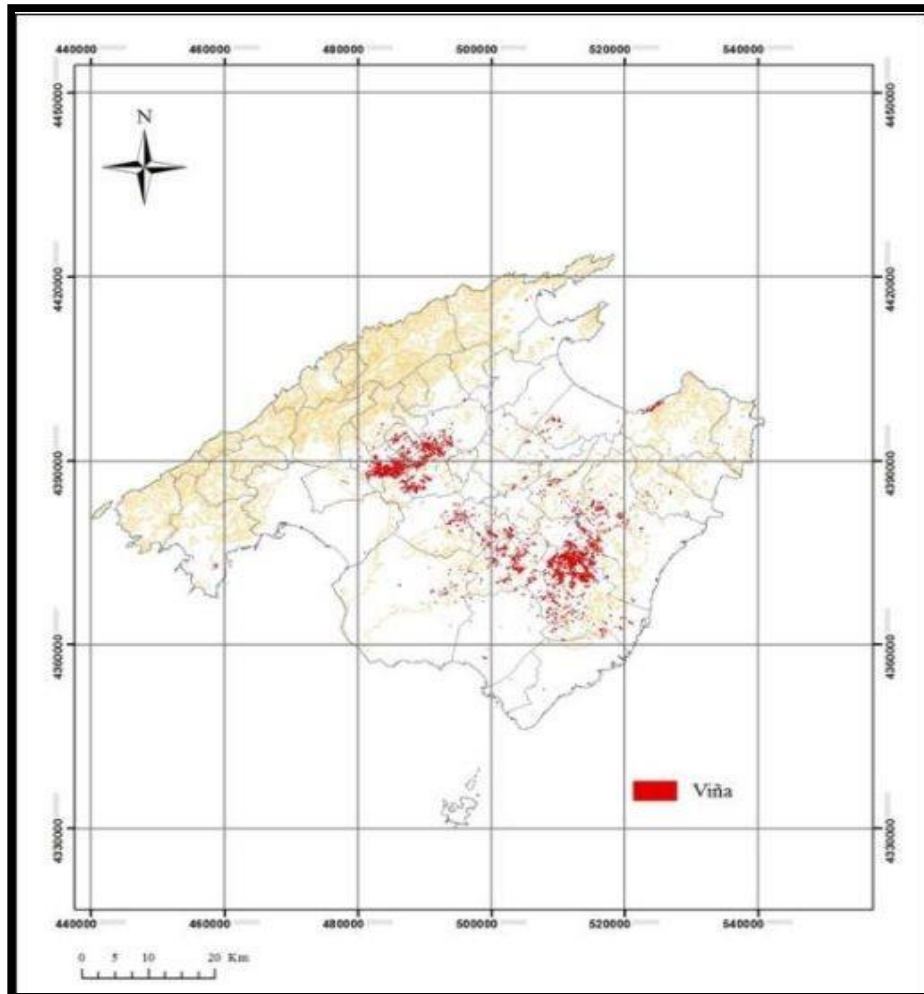
Some features of the traditional Balearic wine are:

- The broad varieties of grape vines used for the production of the wine; due to the geographical location in the Mediterranean it is easy to receive raw materials from other Mediterranean countries. This feature makes wines with unbalanced proportions, which results in really original tastes.
- The use of huge winepress where it was difficult to control the fermentation process of the grapes.

3.2. Development and current situation

When we analyse the geographical distribution of the land under vines over the last years (Figure 5), we can see that from 1960-1970 until 1982 there has been a significant decrease of the cultivated area, precisely from 4000 ha to 3066 ha. This is due to the rural exodus and the increase importance of the tourism, as this period is characterized by the boom of tourism activity during the 60s.

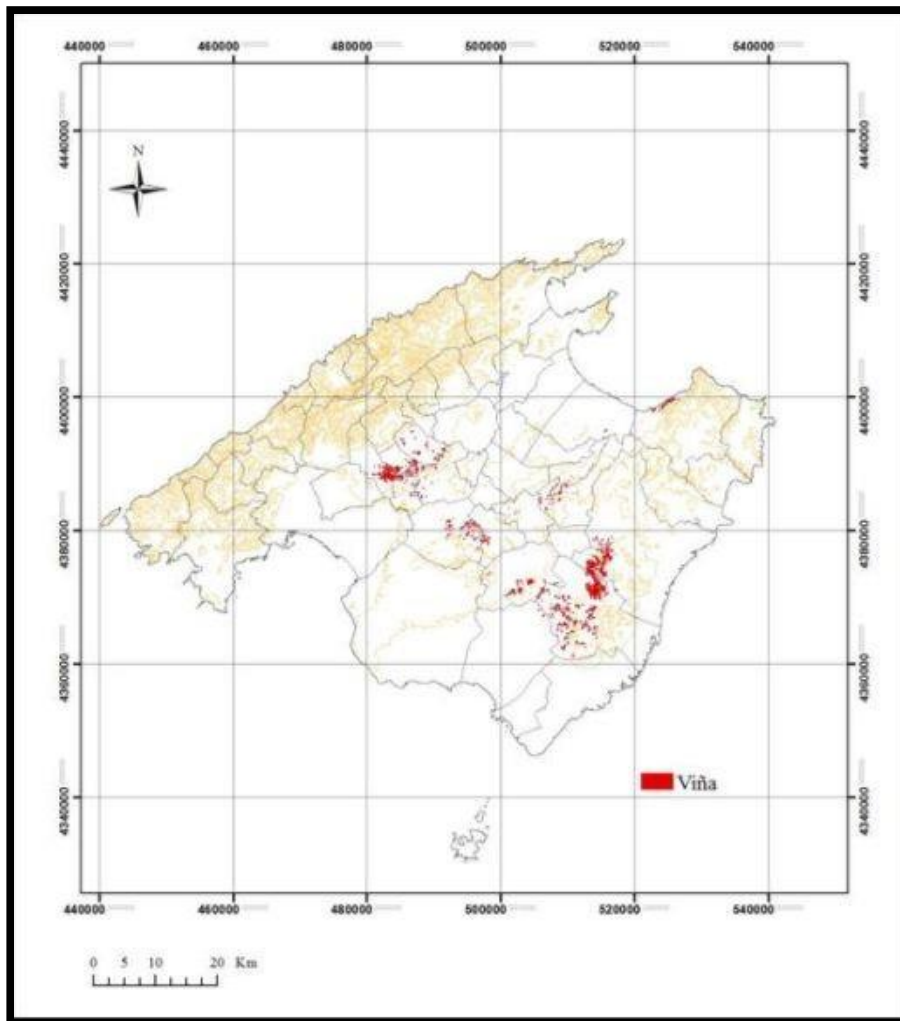
Figure 6. Geographical distribution of vineyards in Mallorca in 1956.



Source: De la viticultura tradicional a la viticultura industrial. Cambios en el paisaje vitícola de la isla de Mallorca. Binimelis (2014)

In 1956 the total area occupied by vineyards was of 3.436.13 ha. As we can see in Figure 5, the area was divided into the Higher Land (also called as *Es Raiguer* , made up by the villages of Consell, Santa Maria, Binissalem and Sencelles) and the Lower Land (located in the South-East part of the island, basically gathering Manacor and Felanitx, however Porreres had a significant presence). The Lower Section area was very dense compared with the other areas.

Figure 7. Geographical distribution of vineyards in Mallorca in 1981.

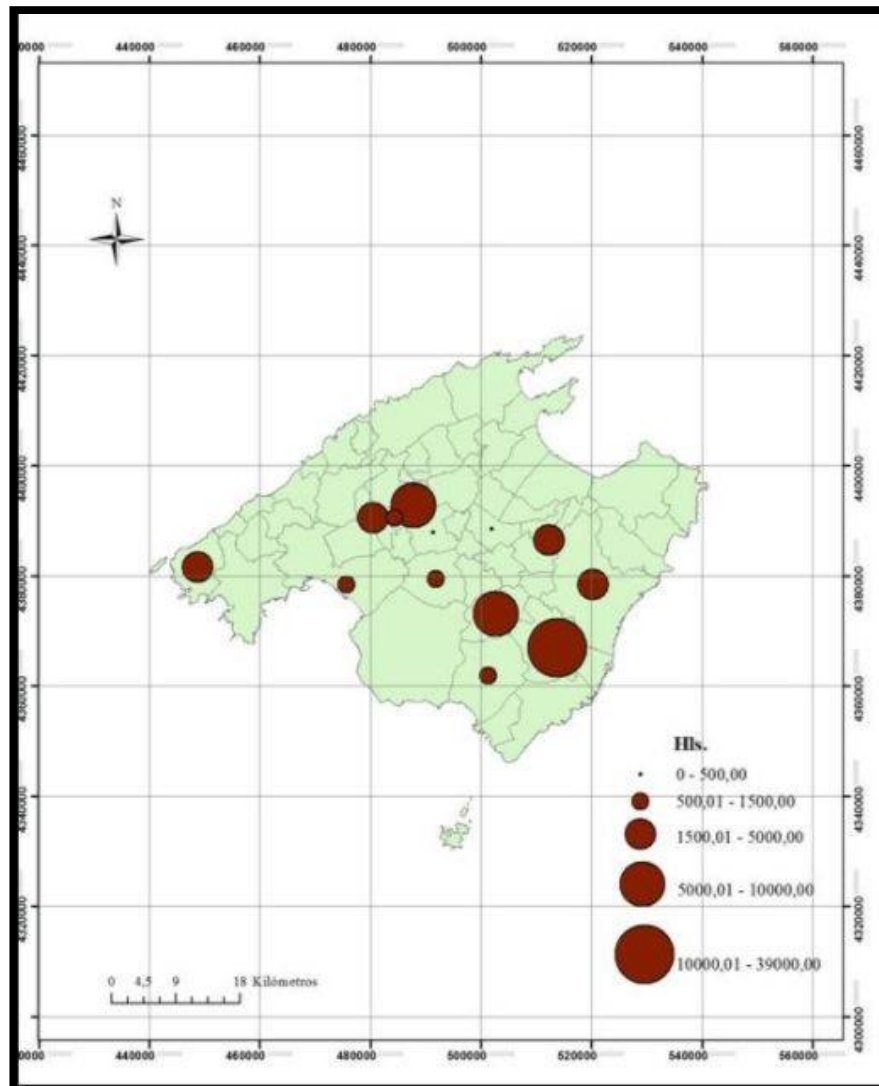


Source: De la viticultura tradicional a la viticultura industrial. Cambios en el paisaje vitícola de la isla de Mallorca. Binimelis (2014)

On the other hand, as we can see in Figure 6, from 1956 until 1981 there was a significant reduction of the vineyard extension.

In 1982 the total surface planted with vines was made up of 3.006 ha, so it shows us a decrease in the used land. Also, during the decade of the 80s between 43 to 65 regions of the island were part of the rural land was occupied by vineyards. The grape wine crops were almost exclusively located in Mallorca, and were gathered mainly in Felanitx, Porreres, Santa Maria, Sencelles and Montuïri, which accounted for 75.51% of the total planted area. The distribution of the planted land was basically polarised.

Figure 8. Production of wine in Mallorca (1987)



Source: De la viticultura tradicional a la viticultura industrial. Cambios en el paisaje vitícola de la isla de Mallorca. Binimelis, (2014)

The Lower Land cellars had a huge production capacity and could use their own grapes but mostly taking outside grape vines, they followed an industrialized production model. An example of their capacity is the Celler Cooperatiu de Felanitx, whose production represents a 40-50 % of the total market production.

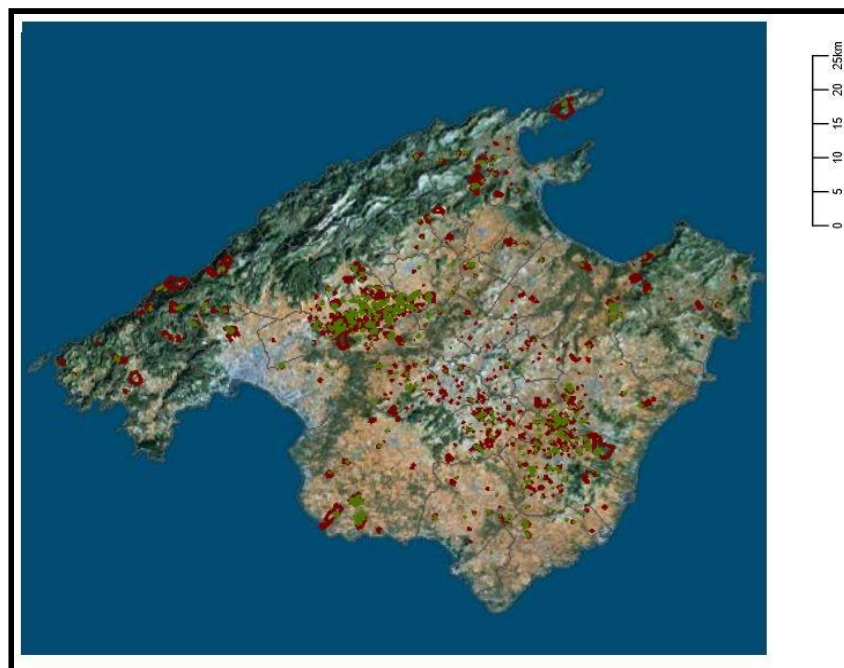
On the other hand, the Higher Land cellars are normally family businesses and focus their production into a direct selling system, although some of the main ones as José Luís Ferrer (Binissalem) and Jaume de Puntiró (Santa Maria) were also exporting their wines and using distribution channels to achieve a broader public.

Despite of the different models of productions, all the cellars focused their efforts in producing *young* wine for the locals, but mostly for the growing number of tourists that were discovering the island.

Nowadays, the last records about the planted surface are registered in the *Registre vitícola de les Illes Balears*, an institution dependant of the *Conselleria d'Agricultura, Medi Ambient i Territori del Govern de les Illes Balears*.

In 2013, they initiated a tool called SIG (Servei d'Informació Geogràfica), developed by the public firm SITIBSA (Servei d'Informació Territorial de les Illes Balears), which consists in a viewer to locate geographically all the smallholdings and enclosures registered, whose aim is vine plantations. There are more than 3000 locations registered, and 1326 farmers collaborating in this project. We can see the actual situation of the Balearic Islands thanks to this app, and save and use the information for our research.

Figure 9. Smallholdings and enclosures geographical distribution in Mallorca (2018)



Source: SITIBSA (2018a).

We can see that in Mallorca (Figure 9) there is still a clear division between vineyards found in the Higher Land (Binissalem, Santa Maria, Santa Eugenia, Sencelles) and those in the Lower Land (Felanitx, Manacor, Porreres). Also, we notice some small plantations in the Northern part of the island located in the coast of Banyalbufar and Valldemossa, and also close to Pollença Bay. On the Higher Land we can see a bigger concentration, compared with the Lower Land.

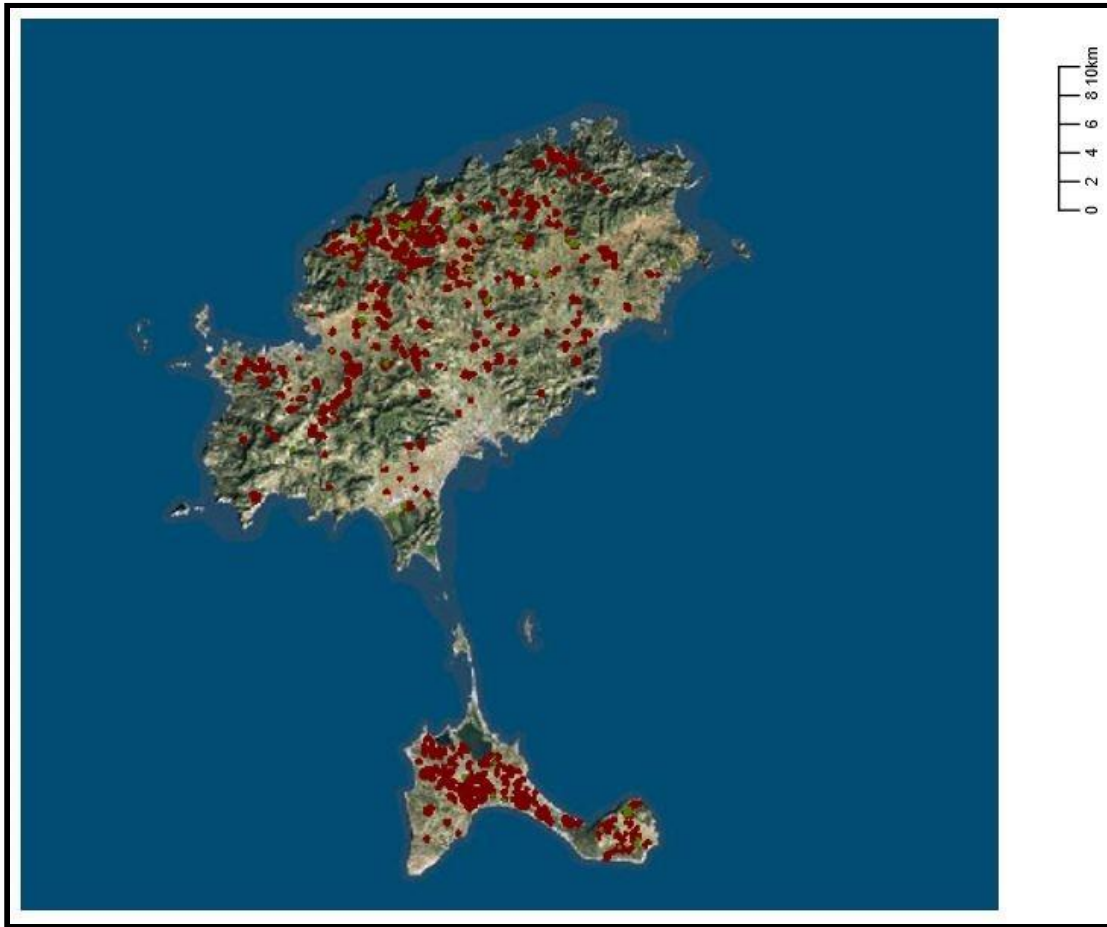
Figure 10. Smallholdings and enclosures geographical distribution in Menorca (2018)



Source: SITIBSA (2018b).

Menorca presents a small amount of vineyard plantations all around the island (Figure 10). Most of them are located on the Western part of the island, in Cala Galdana and its surroundings, but we can also see some small dispersed plantations in the South Eastern part as well as in Sant Lluís or Son Bou.

Figure 11. Smallholdings, enclosures geographical distribution in Eivissa and Formentera (2018)



Source: SITIBSA (2018c).

Pitiüses islands shows us a very different situation compared with the rest of the islands (Figure 11). Eivissa has a really concentrated area in the North-West part of the island, in Santa Agnès de la Corona and Sant Mateu d'Albarca. However, we can appreciate a line that connects Sant Mateu d'Albarca with Sant Josep de sa Talaia, and continues until Cala en Bassa. Also, we find a relevant concentration of vineyard land close to Sant Joan de Labritja.

Formentera has a more concentrated panorama, due to its smaller extension. We can see an important area around Sant Francesc Xavier, and also some concentration around El Pilar de la Mola.

- Production Data:

In the Balearic Islands there are two kind of brands, Vins de la Terra or Denominació d'Origen (depending on some features and legal requirements that we will explain broadly in section 4.2).

In Table 5 we compare the change in the planted surface during the period 2015-2016. We can see that the total amount of planted land has decrease by 2.51% from 2015 to 2016.

Table 4. Evolution of planted land in the Balearic Islands

Denominació	Hectàrees 2015	Hectàrees 2016	Variació 15/16
DO Binissalem	362,37	347,27	-4,17%
DO Pla i Llevant	359,00	362,08	0,86%
Total vi amb DO	721,37	709,35	-1,67%
Vi de la terra Illes Balears	2,01	4,41	119,40%
Vi de la terra Serra de Tramuntana	11,04	14,90	34,96%
Vi de la terra Mallorca *	780,08	740,00	-5,14%
Vi de la terra Eivissa	57,03	59,00	3,45%
Vi de la terra Illa de Menorca	37,00	41,15	11,22%
Vi da la terra de Formentera	13,05	12,38	-5,13%
Total vi de la Terra	900,21	871,00	-3,24%
TOTAL SUPERFICIE	1621,00	1580,35	-2,51%

Source: IQUA (2016).

To understand the current situation of each island, we are going to analyse separately the statistics taking into account the brand and the type of wine (red and white).

A) Mallorca:

When we compare the evolution in wine production of Vi de la Terra de Mallorca during 2015-2017 (Table 5), we can observe that there has been an increase of the number of cellars by 26.66%, so the Balearic wine industry has grown during that period. Accordingly, we notice an increase of the planted surface by 0.49%. The difference in growth could be explained due to the outsourcing of raw materials in production; the new cellars could be buying the grape to the ones who were already in the market.

Table 5. Production of Vi de la Terra de Mallorca (2015-2017)

Statistics until year 2017		2015	2016	2017	Variation 16/17
Cellars		44	45	57	26.66%
Vineyard Surface (Ha)	White	190	185	225	21.50%
	Red	590	554	518	-6.55%
	TOTAL	780	739	743	0,49%
Vinegrape Production (Kg)	White	1.161.834	1.125.095	1.299.768	6.73%
	Red	2.533.858	3.111.848	2.655.348	-13.61%
	TOTAL	3.695.692	4.236.944	3.889.116	-8.21%
Wine Production (Hl)	White	7.509,48	7.418,73	8.529,36	14.97%
	Red	14.116,95	15.869,23	13.361,42	-15.80%
	TOTAL	21.626,43	23.287,96	21.890,78	-6%

Source: Own elaboration based on IQUA data (2018).

On the other side, the production of grape have decreased by 8.21% compared with 2016, but the year before (2015) we can see an increase, but as we know that depending on the year the climate conditions are a crucial point in the results (LaVinoteca, 2018) so it can be just a matter of the normal fluctuations on the results of the harvest. However, there are no actualised records of the quality of the harvest in those years. Also, when we analyse the differences in the wine production, we can notice a decrease that is linked with the quantity of wine grape production.

Once we compare the growth of the different kind of wines (red or white) we can observe that during the period white wine had experienced a significant growth of around 15% while red wine has suffered a similar but negative growth.

B) Menorca:

As we have already seen in the Figure 9 about the geographical distribution of the smallholdings and enclosures in Menorca, the situation is quite different than in Mallorca. There is a small amount of cellars around the island, whose number have not changed since past year.

Table 6. Production of Vi de la Terra de Menorca (2015-2017)

Statistics until year 2017		2015	2016	2017	Variation 16/17
Cellars		8	9	9	0%
Vineyard Surface (Ha)	White	21.56	23.13	21.58	-6.70%
	Red	16.39	18.02	18.53	2.83%
	TOTAL	37.95	41.15	40.11	-2.53%
Vinegrape Production (Kg)	White	86360	111812	96715	-13.50%
	Red	109698	119770	104223	-12.98%
	TOTAL	196058	231582	200938	-13.23%
Wine Production (Hl)	White	693.05	732.05	725.09	-0.84%
	Red	449.80	652.27	447.73	-31.36%
	TOTAL	1142.85	1384.32	1172.82	-15.27%

Source: Own elaboration based on IQUA data (2018).

As we can see in Table 6 the production of Vi de la Terra de Menorca during 2015-2017 suffered a general decrease. However, we can observe that the only variable that has not experienced a recession is the vineyard surface of red wine, which represents an increase of 2.83%. Despite of this increase, the production of this kind of wine has decreased by 12.98%, so this expansion of land could not diminish the effects of this general recession. From this data we can deduce that it could had been caused by a bad harvest, as well as in Mallorca's case that we have already studied.

C) Eivissa:

In Eivissa we found a more favourable situation compared with the previous island (Menorca). Although there have not been any changes in the amount of productive cellars in the island, most of the variables have a positive perspective.

Table 7. Production of Vi de la Terra de Eivissa (2015-2017)

Statistics until year 2017		2015	2016	2017	Variation 16/17
Cellars		5	6	6	0%
Vineyard Surface (Ha)	White	13.33	12.91	12.93	0.15%
	Red	43.70	46.60	46.05	0.97%
	TOTAL	57.03	59.51	59.98	0.79%
Vinegrape Production (Kg)	White	60412	54870	56213	2.45%
	Red	150336	164968	156510	-5.13%
	TOTAL	210748	219838	212723	-3.24%
Wine Production (HI)	White	388.50	344.79	350.65	1.70%
	Red	322.25	384.40	319.48	-16.89%
	TOTAL	710.75	729.19	670.13	-8.09%

Source: Own elaboration based on IQUA data (2018).

The planted surface has slightly expanded in red wine case as well in the white case.

We can notice a similar phenomenon as in Table 5 about the production of Vi de la Terra de Mallorca during 2015-2017. If we check the red wine statistics we can see a decrease meanwhile the white wine data experiences a positive growth, as it happened in Mallorca.

D) Formentera:

Despite the fact of the small surface of this island, we have already seen in Figure 10 that Formentera has a relevant extension of vine plantations (smallholdings and enclosures).

Table 8. Production of Vins de la Terra de Formentera (2015-2017)

Statistics until year 2017		2015	2016	2017	Variation 16/17
Cellars		2	2	2	0%
Vineyard Surface (Ha)	White	6.25	5.60	6.24	11.43%
	Red	6.80	6.78	7.62	12.39%
	TOTAL	13.05	12.38	13.86	11.95%
Vinegrape Production (Kg)	White	19586	22417	13839	-38.27%
	Red	22227	24481	20611	-15.81%
	TOTAL	41813	46898	34450	-26.54%
Wine Production (HI)	White	101.60	124.45	81.10	-34.83%
	Red	102.85	110.30	103.75	-5.94%
	TOTAL	204.45	234.75	184.85	-21.26%

Source: Own elaboration based on IQUA data (2018).

When we analyse the actual data (Table 8), we can observe two different set of circumstances. On the one hand, there is an important increase of the planted extension of vineyard, with a total of an 11.95% of positive variation. However, on the other hand we can see a remarkable decrease in the production in all the different kinds and aspects. Maybe we can link it again with the same deduction as in

Mallorca case about the fluctuations in the harvest conditions, or as it is a small industry, we can deduce that the minor differences on the statistics cause a major effect on the final analysis.

4. European and Balearic legislation and Policies

4.1 EU Policies and Legislation

According to the Study on the competitiveness of European Wines about the EU wine policy framework (European Commission, 2014), in 1962 the Common Market Organisation (CMO) was established, and it was the responsible of collecting all the information about quality and production for some wines that were produced in specified regions.

First of all, the Regulation (EC) No 816/1970 set up:

- Price and intervention regime.
- Regime for trade with third countries.
- Rules for production and control in planting.
- Rules for regulation of oenological practices and processes.

After the former, the Regulation (EC) No 1162/76 introduced a ban on planting new vineyard to adjust the wine-growing offer to market demand, which was extended until 2015.

In 1999, the CMO made a reform with the Regulation (EC) 1493/1999 which removed the price regime and simplified the distillation measures. The main objectives were maintaining the balance between supply and demand, providing opportunities to exploit expanding markets, promoting competitiveness and support to the market. Also it created a classification of authorized wine varieties, a wine inventory and a vineyard register.

Later, in 2008, the new changes of the wine made by the CMO were part of the reform of 2003 of the CAP (Common Agricultural Policy) introduced by the Regulation (EC) No 1782/2003. It consisted on several new measures that changed substantially the 1999 wine CMO that were implemented by the Regulation (EC) No 479/2008, and they were:

- Establishment of a national aid programme.
- Creation of a three-year grubbing-up scheme, by the re-designation of the quality wine system and the extension of planting rights to 2015/2018.
- Intervention measures are optional or suppressed.
- Reform of the regime for trade with third countries, with the aim of harmonising the existing horizontal regulations (in particular the PDO / PGI system in force since 1992 for other agricultural and food products, by the EU quality policy).

The objectives of this new reform were the empowerment of the competitiveness of EU wine producers, the establishment of the reputations of EU quality wines as the best wines in the world and the recovery of old markets and the attraction and gain of new markets.

In 2014 a reform of the CAP was introduced for the period 2014-2020, and with this one, a new change of the wine provisions within the CMO was also introduced. These rules are contained in the Regulation EC No 1308/2013 of the European Parliament and the Council, and they establish a common organisation of the markets for agricultural products.

The most remarkable improvements of this law are:

- The abolition of the total ban on the planting on vineyards. Instead, there is a system of authorizations that says that each year the owner will be able to increase new plantings by 1% of the total area actually planted, as measured on 31st of July of the previous year.
- Two clarifications about the designations of origin and geographical indications were introduced, to the completion of the article 118b in Reg (EC) 1234/2007. They are the following:
 - In the case of PDO (Protected Designation of Origin): *“the production must take place in the geographical area”* and *“shall cover all the operations involved from the harvesting of the grapes to the completion of the wine-making processes, with the exception of any post-production processes”*. That implies that, for example, the bottling process could be done outside the geographical area.

- Regarding PGI (Protected Geographical Indication): *“the maximum 15% share of grapes which may originate outside the demarcated area shall originate from the Member State or third country in which the demarcated area is situated”*. So, all the processes have to be done inside the geographical area indicated, but as maximum a 15% of the grape used could be from outside this delimited area.

4.2 Policies and Legislation in the Balearic Islands

As we have already mentioned in section 3.2, in the Balearic Island there are two kind of wines depending on its characteristics, Denominació d’Origen and Vi de la Terra, and each one follow a different legislation.

4.2.1 PDO. Denominació d’Origen

Regulated by this branding we can find Denominació d’Origen de Binissalem and Denominació d’Origen del Pla i Llevant.

- Denominació d’Origen de Binissalem:

It was created by an association of cellars in 1988 that requested to the Conselleria d’Agricultura i Pesca the consideration as Denominació D’Origen. Its regulation was developed in 1989 and approved in 1991. Its production conditions are that for the elaboration of the wine they can only use and harvest the following kind of grapes:

- Red wine: Manto Negre, Callet, Cabernet Sauvignon, Sirà, Merlot; among some others.
- White wine: Moll, Moscatell d’Alexandria, Moscatell de gra menut, Chardonnay; are some of them.

However, the main kinds of grape used are manto negre, moll and moscatell. In the process of elaboration there has to be a minimum of 30% of manto negre on the composition of the red wines, and a minimum 50% of moscatell or moll on the white wine.

Also, its production is limited by the regulation by 9000 kg/ha in each type of wine, and the percentage of alcohol has to be a 10% in the white ones and a 10.5% in the red ones.

This brand is located in Binissalem, which is situated in the center of the island, and it covers 312.72 ha. There are 12 cellars that are into this regulation and they produced last year 10126 hl of wine. The main cellars of this variety of Balearic wine are: Bodegas José Luis Ferrer, Celler Tianna Negre, Celler Ca'n Ramis, Vinya Taujana and Jaume de Puntiró.

- Denominació d'Origen del Pla i Llevant:

It is located in the East-center of Mallorca and integrated by Algaida, Campos, Felanitx, Lluçmajor, Manacor, Porreres, Santa Margalida, Sineu, Villafranca; among other locations. It covers a 341.18 ha of surface and produces 14792.36 hl of wine by its 13 cellars.

Its origin is found in 1999, and its regulation dates back to 2005. In its conditions it is stipulated that each category of wine has to be produced with some specific varieties of grape:

- Red wine: Manto Negre, Callet, Cabernet Sauvignon, Merlot, Sirà, Pinot Noir; are some of them.

- White wine: Prensal Blanc, Parellada, Moscatell, Chardonnay, Viognier, Macabeu; among others.

Its production has a limitation of a maximum of 10000 kg/ha of red wine and 11000kg/ha of white wine, with also a limitation of the percentage of alcohol of 10.5% in the red wine case and a 10% in the white wine case.

The main firms of this D.O. are Bodegas Bordoy, Miquel Oliver Vinyes i Bodegues, Vins Miquel Gelabert, Vins Toni Gelabert and Vinyes i Bodegues Pere Seda.

4.2.2 PGI. Vi de la terra

This classification has 6 different branches, a general one, one per each island and a specific one in Mallorca.

- Vi de la Terra Illes Balears:

The origin of this variety dates back to 2003 when the Conselleria d'Agricultura i

Pesca starts its regulation. This designation includes the territory of all the Balearic Islands. Its extension is of 4.16 ha, produced 129.58 hl in 2017 and it consists of 3 cellars.

As in the Denominació d'Origen regulation, its wines have to be produced with some specific kind of grapes and has a limitation of the percentage of alcohol:

- In the red wine case, the varieties of grapes have to be Cabernet Sauvignon, Merlot, Sirà, Monestrell, Manto Negre, Callet, Pinot Noir; among others. Its alcoholic percentage has to be of 11.5%.

- In the white wine case, the grapes used are from the class Chardonnay, Moscatell d'Alexandria, Moscatell de gra menu, Moll, Macabeu, Malvasia aromàtica and Sauvignon Blanc; between some more of them. The alcoholic percentage regulations is 10%.

Most of the wines produced of this classification are red wines, elaborated with cabernet sauvignon, merlot or callet. The main cellars are Bodegues Torralbenc Vell S.L, Son Bordils and Son Vell Vinyes i Vi.

- Vi de la Terra Mallorca:

After the creation of the denomination Vi de la Terra, in 2007 the geographical indication "Mallorca" was born. It was created for the wines that were traditionally known under the classification Vi de la Terra that were produced in Mallorca.

Its geographical framework is compound by all the municipalities of the island, and its wines have to be produced with grapes from Mallorca and bottled in the production zone. Each bottle has an official control number provided by the Direcció General de Medi Rural i Marí, which carries out a control and certification.

The extension of this variety is 743 ha of surface, producing 25344.77 hl last year, and there are 57 cellars that elaborate Vi de la Terra Mallorca.

As well as in the other classifications that we have already seen, the following grapes (among some others) are the ones that have to be used in the production:

- Red wine: Callet, Manto Negre, Cabernet Sauvignon, Merlot, Sirà.
- White wine: Moll, Chardonnay, Macabeu, Malvasia, Moscatell d'Alexandria, Moscatell de gra menu.

Some of the cellars attached to this variety are Bodegues Angel, Bodegues Macià Batle, Bodegues Son Puig, Celler Son Vives, Vins Nadal and Vinyes i Vins Ca sa Padrina.

- Vi de la Terra Illa de Menorca:

All the wines produced in the island of Menorca, exclusively elaborated with Cabernet sauvignon, Merlot, Monestrell, Ull de llebre, Sirà for the red wines, and Chardonnay, Macabeu, Malvasia, Moscatell, Parellada, Moll for the white ones; are under this denomination.

Its regulation is the newest one of all the classifications. It was approved in 2013, and it determines the establishment of the official control number in each bottled produced, and a maximum of 8000 kg/ha per each kind of wine. The red wines have a 12% of alcohol and the white ones a 11.5%.

The surface covered is 40.11 ha, its 2017 production is 1290.6 hl and there are 9 cellars under this regulation. Bodegues Binifadet, Sa Bodega de Son Cremat and Finca Sa Cudia are some of the cellars that include this regulation.

- Vi de la Terra Eivissa:

The regulation and creation of this specialization was approved by the Govern de les Illes Balears in 1996 by the Decret 197/1996. This wine is also under the condition of the official control number regulation of the bottles.

Its extension is 59.98 ha of Eivissa island and its 6 cellars produced 1341 hl last year.

- The red wines have to be elaborated with Monestrell, Ull de llebre, Cabernet sauvignon, Merlot or Sirà, and its alcoholic percentage have to be 12%.
- The white wines are produced with Macabeu, Parellada, Malvasia, Chardonnay, Moscatell d'Alexandria and Moscatell de gra menu, and its alcohol content have to be 11%.

Some examples of firms in this sector are Antonio Marí Prats (Xumeu Vinya), Bodega Sa Cova and Ca'n Maymo.

- Vi de la Terra de Formentera

In Formentera winery is one of the main agricultural activities of the island, and its the one with better future forecast. Its regulation is also one of the newest ones, established in 2013, and also includes the official control number in each bottle. The maximum amount of production is 8500 kg/ha in each kind.

The main grape kind used is Monestrell, but in each kind some of the following varieties have to be included:

- Red wine (maximum alcohol content: 12.5%): Monestrell, Fogoneu, Ull de llebre, Cabernet Sauvignon and Merlot.
- White wine (maximum alcohol content: 11.5%): Malvasia, Moll, Chardonnay, Viognier, Garnatxa blanca and Moscatell de gra menut.

There are two cellars (Cap de Barbaria and Terra Moll) that produced 215.60 ha in 2017, and they exploit an area of 13.86 ha of surface.

- Vi de la Terra Serra de Tramuntana-Costa Nord:

This variety is also inside Mallorca island, but it only includes 18 municipalities on the Northwest part of the island that are located between Cap de Formentor and the south-west coast of Andratx. The extension of the vineyards is 15.87 ha, and there are 5 cellars producing this branding. It was regulated in 2002 by the dictation of the council of the Conselleria d'Agricultura i Pesca.

Its production was 548.50 hl last year, and it is limited to maximum 9000 kg/ha, its bottles have to contain the official control number as in all the other Vi de la Terra regulations and the wines have to be produced exclusively with:

- Red wines: Cabernet Sauvignon, Merlot, Sirà, Monestrell, Ull de llebre, Callet and Manto Negre.
- White wines: Malvasia, Moscatel de Alexandria, Moscatel de gra menut, Moll, Parellada, Macabeu, Chardonnay and Sauvignon blanc.

The alcoholic content has to be a maximum of 12.5% for the red wines and 12% for the white wines.

Bodega Ca'n Picó, Cooperativa de sa Malvasia de Banyalbufar and Vinyes d'Alaró are some of the producer firms.

5. Sustainability in the winery sector

Nowadays, there is a phenomenon occurring on the earth that makes that there has been a shift on the earth average temperature, and it is called global warming (Burney, 2013; Jones and Webb, 2010; National Geographic, 2013; IPCC, 2013). However, global warming is not uniform and there is greater warming over land, specially at the higher latitudes like in the Northern Hemisphere (IPPC, 2013).

The agriculture sector is closely connected with this situation, due to the fact that all the related activities are connected with climate and weather. Therefore, winery sector is also suffering its consequences.

As Jones and Webb (2010) argued, the wine grape varieties have a very narrow climate range and it implies that it is even more risky to expose them to short-term climate variability and long-term climate changes, than other crops (Jones and Webb, 2010).

For the wine the most minuscule modification in proportions can produce the most major modifications in flavor, because any shift in temperature can create overripe grapes that would change completely the wine (Santisi, 2011). Hence, the climate change would shift wine production in all the regions. In Europe, there would be a huge impact of global warming on wine growing, and the loss of the Gulf Stream could chill Bordeaux and parts of Spain. This would force to change the plantation system to cooler climate grapes (Furer, 2006).

To face the effect that will produce this phenomenon, researchers have proposed a series of practical solutions for existing and newly planted vineyards:

- 1) To offset rising temperatures, including canopy management for improving the soil water balance (Keller, 2010) and also consider night-time harvesting and faster delivery of the seeds to avoid spoilage (E-VitiClimate, 2012).
- 2) To offset reduced water supply and minimize the effects of global warming, reuse, treat and recycle water to minimize waste (E-VitiClimate, 2012).
- 3) To offset increased sunlight, use training techniques and row orientation, for example, the north-south orientation causes difficult western exposure in the afternoon (Keller, 2010).
- 4) To offset a substantial change to vineyard climate, swift to grapes most adaptable to new climatic and weather conditions for producing premium wines (Kirkpatrick, 2011).

- 5) To mitigate against global warming, reduce our “carbon-footprint” by reducing the carbon using (Jones and Webb, 2010).

These are some of the tips among a lot of others that would help to contribute to the sustainability of the winery industry.

6. Oenological tourism in the Balearic Islands

In this section we are going to study first, which are the current alcohol consumers' preferences, to see in which position is wine in our country and secondly, which is the situation of the oenological tourism in the Balearic Islands. We linked both topics because to understand the purchase behavior of the visitors to our islands, we will have to study which trend is ruling in the world.

6.1 Wine consumption trends

The world is divided in two subcultures in terms of alcohol consumption, wet cultures and dry cultures. Wet cultures are the ones where alcohol consumption is part of the daily life of the society and it is regularly present in meals. The alcoholic drinks are easy to buy and there is a small percentage of abstainers. It is really characteristic of the Mediterranean regions, where the wine is the most popular drink.

On the other hand, dry cultures are the ones in which it is not usual to drink alcohol and it is not part of the daily life. Its access is really restricted and there is a high level of abstainers in the society. However, when there is consumption of alcohol in these countries the individuals have higher risk of poisoning. This culture is typical of the United States, Scandinavian countries and Canada; where the preferred drinks are beer and distilled alcohols.

Nevertheless, recent studies show that this division is disappearing and there are emergent trends of behavior where we have to focus in the study of the consistency of the consumption and the inebriation level.

Spain is one of the countries going through a transition, because there is an increasing amount of the society which practice *binge drinking*. This term is referred to the action of drinking a big amount of alcohol at once. Also, this change involves that beer is gradually occupying the place of wine in the Spanish customers.

Forecasts says that the decrease of consumption of wine in Spain will achieve a 40% in 2022 (Ikerfel-OeMv, 2012), which are the current alcohol consumers' preferences, to see in which position is wine in our country. There are some theories that try to explain this decrease of consumption:

1. Alcohol consumption has decreased in our country because lifestyles are changing to a healthier way of living.
2. Beer has become a big competitor in Spain. Beer consumption has surpassed wine consumption.
3. Wine is considered as a very complex drink, due to the fear that the consumers have about not being experts of this topic to make a consumption decision.
4. Young population is not interested in wine. The marketing resources are not focusing efforts on this segment.
5. Restaurants and distribution system have to consider pricing. It is very frequent to find a huge difference between the cost and the sale price. Also, it would be better to implement a broader offer in the restaurant and a selling system by cups of wine instead than in bottles because it would help to develop an interest to the consumers (Albisu and Zeballos, 2014).

6.2 Tourism and wine in the Balearic Islands

According to the study about emergent tourist products in the Balearic Island (Cámara de Comercio, 2010), oenological tourism is a kind of tourism that consists in tasting, consuming and knowing the process of elaboration of wines, through different routes around cellars and wine museums. It is closely linked with gastronomic tourism because this kind of visitor also likes to try "tapas" and typical dishes.

The tourist profile of this segment is person who is 40 years old or older with a middle-high purchasing power, and mainly of Spanish origin (from Madrid or Catalonia). In terms of knowledge about this topic, there is a huge variety, mixing expertise people and public that just participate to complement other activities.

In the Balearic Islands we can underline the wine route in Binissalem (Ruta del vino de Binissalem), and also we will find a great number of cellars, hotels and other locations related with the wine industry.

The oenological tourists spend a daily average of 120€, they stay 2 days maximum in the same place, and depending of their nationality they come for the spring-autumn season (international) or summer season (national) (Cámara de Comercio, 2010).

The advantages of the islands are the great farmland and climate, as well as suitable oenological procedures, a broad variety of grapes and high qualified wine experts.

The offer on the islands is based in small cellars of new creation, with a lot of potential. They produce its own variety of wine depending on its specialization (Denominació d'Origen, Vi de la Terra) and the selection of grapes used. This is also an advantage because the best oenological routes have to include wines that are not from the same "family".

The best strategies to develop this segment of tourism are developing a marketing strategy in which achieving the word-of-mouth promotion would be the aim, boost oenological routes in different languages that include tasting of wine as well as typical products and dishes, and mostly try to study and understand the main motivation of this tourist profile and adapt the supply to them.

Oenological activities encourage tourism during low and medium season and it is not just based in "sun and beach" leisure and allows to encourage cultural, rural and gastronomic tourism due to its link. Hence. It helps to deseasonalize tourism activities in the islands. In addition, it is a way to create international exporting connections and to expand our recognition around the world.

7. Conclusions

As we indicated earlier in the manuscript, the purpose of the study is threefold: First, to analyze the economic importance of the wine industry at the international, national and Balearic level; second, to explore the origins and evolution of the wine industry over the world and in the Balearic territories; plus the legal requirements and policies implement in the industry at the EU, Spanish and Balearic level; and third, to study the possibilities of the oenological tourism and some ways to combine sustainability with viticulture techniques.

After carrying out this research, we can draw the following conclusions. First of all, the global situation shows us a lineal stable trend off the planted surface last years, with the 50 percent occupied by the five main countries (Spain, China, France, Italy and Turkey). Regarding to wine production, there has been a considerable increase since 2000 in terms of volume, and from the import/export data we conclude with a

balanced growth. On the other hand, forecasts indicate that Spanish production will continue with the same behavior of the previous years of smooth growth. It is the first exporter country in terms of volume and its main DOP are Rioja, Cava, Valencia, Cariñena, Jerez, Cataluña, Valdepeñas and La Mancha. Through Porter analysis we have seen that the main weakness is the threat of substitutes, like beer or distilled alcohol.

In the Balearic Island, since the older times and until nowadays, wine industry is divided in the Higher Land and Lower Land. It has two main brandings depending on its legal features; Denominació d'Origen (which has the same requirements as PDO) and Vi de la Terra (which is equivalent to PGI). Each island has their own Vi de la Terra branding, except Mallorca that has two (Mallorca and Serra de Tramuntana-Costa Nord). In addition, both two existing Denominació d'Origen brandings are located in Mallorca (Binissalem and Pla i Llevant). Also, the production and commercialisation in year 2017 have experienced a decrease compared with the previous year (2016), however it presents similar numbers than two years ago (2015). The number of cellars has not increased, they have a small size and are relatively of new creation.

On the other hand, we have understood from our research the importance of the implementation of sustainability techniques to offset the effects of climate change and to reduce the "carbon-footprint". It is relevant specially for viticulture because wine is a product that has really ease to change its features with any variation of its climate or surface conditions.

Also, the statistics have determined a change in the alcoholic drinks consumption, as well as the quantity and its frequency on the daily life. Wine consumption in Spain is decreasing these last years, due to the emergent trend of beer and its consideration as a complex product, among other theories.

Finally, during the review of the information about oenological tourism in the Balearic Islands we have seen that is still in an initial phase, emphasizing the "Ruta de vins de Binissalem", and needs to continue finding new ways of promotion and creating more routes. The Islands have a big potential for this kind of tourism thanks to the broad variety of wines that they produce, due to the diversity of grapes used in the production, that it is a reclaim for this touristic profile.

We have to work hard on the development of this industry as it is an alternative for the "sun and beach" tourism, because it can be developed during low and medium season, to help deseasonalized tourism activities, and to promote other activities around the islands. Also, it helps to establish exporting links between other countries and increasing our international recognition. It would be an interesting way to develop new businesses and increase the wealth of the population.

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