MASTER OF SCIENCE IN

FINANCE

MASTER FINAL WORK

PROJECT

INVESTMENT VALUATION OF A PROJECT IN A WINERY: THE CASE OF SOCIEDADE AGRÍCOLA DE VALE DE FORNOS

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CARLOS RICARDO DE FREITAS DAVID

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Abstract

Wine production and consumption in the world has been pretty regular over the last 15 years. In Portugal, the wine production sector has a long tradition, being always present in the lives of Portuguese people who are the biggest wine consumers *per capita* in the world. However, tradition has not avoided an increase, over the time, of the level of interest and demand of the wine consumer. That demand, together with the revitalization of the wine exports, with the strong support of the Portuguese Government that has given subsidies for the requalification of wine explorations, has allowed the emergence of new and bigger market players, and above all, of new wines of higher quality. Currently, Portugal is one of the biggest wine producers and consumers in the world. And it is the sixth country in which the exportation of that product has a bigger added value.

Based on the specific case of a national winery company, that has as core business the production, bottling, trading and distribution of wine in Portugal, this work as the following goals: (1) put in context and identify the competitive scenario of the company and (2) make an analysis of the viability of an investment project based on the previously identified scenario, using the Discounted Cash Flows as an evaluation method. Will be used the FCFF, APV and FCFE models to obtain the net present value of the project investment, aiming to proof that, if we maintain a constant debt-to-equity, the result of the evaluation is the same.

Based on the data obtained, the company must decide to implement the investment because the NPV is positive and equals to 79,010 euros.

Keywords: Discounted Cash Flows, Winery valuation, FCFF model, FCFE model, APV model, Cash flow forecasting, Scenario analysis.

Resumo

A produção e consumo de vinho no Mundo tem sido bastante regular ao longo dos últimos 15 anos. Em Portugal, o sector vitivinícola tem uma longa tradição, estando sempre presente na vida dos portugueses, que são os maiores consumidores de vinho *per capita* do Mundo. Contudo, a tradição não impediu que o nível de interesse e a exigência do consumidor de vinho aumentasse ao longo do tempo. Essa exigência, juntamente com a dinamização das exportações de vinho, com o forte apoio do Estado Português mediante a atribuição de subsídios para requalificação das explorações agrícolas, potenciaram o aparecimento de novos players de mercado de maior dimensão e, sobretudo, de novos vinhos de qualidade mais elevada. Actualmente, Portugal é um dos maiores produtores e consumidores de vinho em volume do Mundo, sendo ainda o sexto país onde a exportação deste produto tem maior valor acrescentado.

Baseado no caso específico de uma empresa vitivinícola nacional, que tem como core business a produção, engarrafamento, comercialização e distribuição de vinho em Portugal, o presente trabalho tem os seguintes objectivos: (1) enquadrar e identificar o cenário competitivo da empresa e (2) efectuar uma análise de viabilidade de um projecto de investimento com base no cenário anteriormente identificado, utilizando como método de avaliação os Discounted Cash Flows. Serão usados os modelos FCFF, APV e FCFE de forma a apurar o valor actualizado líquido do projecto de investimento e será demonstrado que, mantendo um rácio debt-to-equity constante, o resultado da avaliação é igual usando qualquer dos modelos.

Com base nos dados obtidos, a empresa deve decidir concretizar o investimento na medida em que o NPV é positivo e de valor igual a 79,010 euros.

Palavras-Chave: Discounted Cash Flows, Avaliação de empresas, Modelo FCFF, Modelo FCFE, Modelo APV, Estimativa de cash flows, Análise de cenários.

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1. Introduction

Wine production and consumption in the world has been pretty regular over the last 15 years. In Portugal, the wine production sector has a long tradition, being always present in the lives of Portuguese people who are the biggest wine consumers *per capita* in the world. However, tradition has not avoided an increase, over the time, of the level of interest and demand of the wine consumer. That demand, together with the revitalization of the wine exports, with the strong support of the Portuguese Government that has given subsidies for the requalification of wine explorations, has allowed the emergence of new and bigger market players, and above all, of new wines of higher quality. Currently, Portugal is one of the biggest wine producers and consumers in the world. And it is the sixth country in which the exportation of that product has a bigger added value.

On the basis of the current situation of the company Sociedade Agrícola de Vale de Fornos (SAVF), that has as core business the production, bottling, trading and distribution of wine in Portugal, this work as the following goals: (1) put in context and identify the competitive scenario of the company and (2) make an analysis of the viability of an investment project based on the previously identified scenario, using the Discounted Cash Flows (DCF) as an evaluation method. The combination of these two methods is extremely important as an incorrect analysis of the context in which the company is acting can result in a wrong investment decision, even if you get a positive enterprise value.

To achieve the proposed goals, we will start by presenting a wine sector overview in the world and in Portugal and the related evolution through times, including an analysis of the singularity of the Tejo wine region, where the company operates. We will also detail the business of the company and we will make a first analysis to its economic and financial performance that will allow us to understand the context in which it operates.

We will then make a competitive analysis of the SAVF through the Porter's five forces model and through a SWOT analysis, which we consider to be the starting points to the analysis of the scenarios and for a definition of the best strategy that SAVF shall adopt in the market.

Afterwards, the company and its investment project will be evaluated, firstly with a literature review where we aim to present the different ways of evaluating companies, detailing its specificities, the way of interpreting and the situations in which they shall be used. Secondly, based on an estimation of the several inputs that allow the use of DCF, we will make an evaluation using the methods FCFF, APV and FCFE, aiming to proof that, if we maintain a constant debt-to-equity, the result of the evaluation is the same.

Based on the achieved results, it will be possible to verify the investment project viability and if this project shall be or not implemented in the company. For this, we will also make a sensitivity analysis of the assumptions with the aim of assessing its robustness in the context of SAVF.

2. Macroeconomic overview

According to the data of the International Organization of Vine and Wine (OIV) among the main wine producing countries, there are only 11 countries at a global level capable to produce regularly a value bigger than 5 million hectolitres of wine. These countries control about 87% of the market and are mainly European producers, named "Old World" countries. Figure 1 shows also that the word wine production in 2018 is estimated in 292 million of hectolitres (OIV,2019).

Figure 1 - Worldwide wine production estimative by country

mhl	2013-2017 Average	2017[b]	2018[c]	2018/2017 Variation in %	
Italy	48.3	42.5	54.8	28.9%	
France	43.5	36.4	49.1	34.8%	87% worldwide wine production quota
Spain	38.9	32.5	44.4	36.7%	
United States[d]	23.2	23.3	23.9	2.3%	
Argentina	13.0	11.8	14.5	22.8%	
Chile	11.0	9.5	12.9	35.9%	
Australia	12.6	13.7	12.9	-6.1%	
Germany	8.6	7.5	9.8	30.7%	
South Africa	11.0	10.8	9.5	-12.5%	
China (mainland)	13.1	11.6	9.3	-20.0%	
Russia	5.4	6.3	6.5	3.0%	
Portugal	6.4	6.7	6.1	-10.0%	
Romania	4.0	4.3	5.1	17.9%	
Hungary	2.8	3.2	3.6	14.6%	
Brazil	2.6	3.6	3.1	-13.2%	
New Zealand	2.8	2.9	3.0	5.8%	
Austria	2.2	2.5	2.8	10.8%	
Greece	2.7	2.6	2.2	-15.4%	
Moldova	1.8	1.8	1.9	5.5%	
Switzerland	0.9	0.8	1.1	40.4%	
Bulgaria	1.3	1.1	1.0	-3.6%	
Other countries	14.8	14.5	15.0	3.4%	
World total	**270.9**	**249.8**	**292.3**	**17.0%**	

Source: OIV (2019a)

Regarding the annual consumption of wine in the world, it can be concluded from Figure 2 that the consumption has been practically constant since 2000, with an average annual consumption of approximately 242 million hectolitres. As shown in Figure 3, consumption in 2018 is expected to reach 246 million hectolitres (OIV, 2019a), with the largest producers consuming around 170 million hectolitres during the year. The United States, France and Italy appear as the largest consumers of wine by volume with 33% of the world total.

Figure 2 - World wine consumption
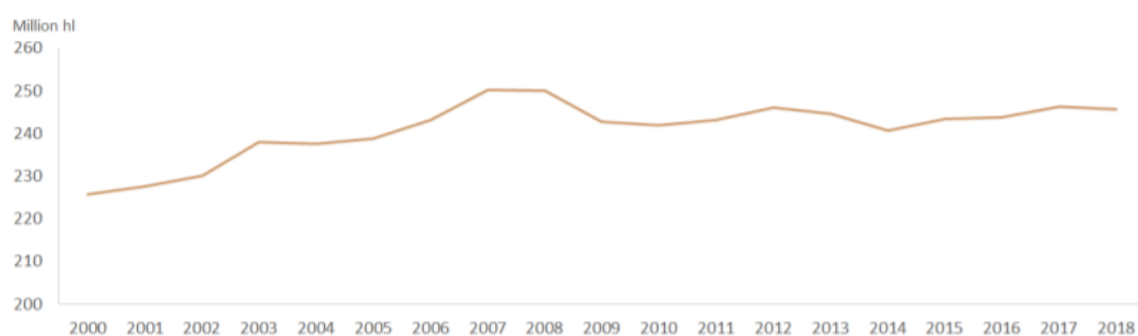
Source: OIV (2019b)

Figure 3 - World wine consumption by country

mhl	2017[b]	2018[c]	2018/2017 Variation in %
United States	32.6	33.0	1.1%
France	27.0	26.8	-0.7%
Italy	22.6	22.4	-0.9%
Germany	19.7	20.0	1.3%
China (mainland)	19.3	18.0	-6.6%
United Kingdom	12.7	12.4	-2.6%
Russia	11.1	11.9	6.9%
Spain	10.5	10.7	1.8%
Argentina	8.9	8.4	-6.3%
Australia	5.9	6.3	6.1%
Portugal	5.2	5.5	5.4%
Romania	4.1	4.5	8.7%
Canada	5.0	4.9	-2.0%
South Africa	4.5	4.3	-4.1%
Brazil	3.6	3.6	0.7%
Netherlands	3.5	3.5	0.7%
Japan	3.5	3.5	1.4%
Belgium	3.0	3.0	0.0%
Switzerland	2.7	2.8	2.9%
Hungary	2.3	2.4	3.9%
Austria	2.4	2.4	-2.6%
Sweden	2.3	2.3	0.0%
Chile	2.3	2.3	-1.5%
Greece	2.3	2.1	-8.7%
Other countries	29.5	29.0	-1.7%
World total	**246.7**	**246.0**	**-0.3%**

a) Source: OIV (2019a)
b) 2017: provisional data; 2018: forecasted date

Additionally, in 2016 the 10 largest corporate producers concentrate almost 13% of the world wine production (Karlsson, 2017), with the 3 largest being US companies that control 5.9% of the world wine production and approximately 65% of the production in all the United States.

From the above data, it can be seen that both in terms of production and of consumption, the sector is quite stable and mature, so the major challenge for the sector is the exploitation of international trade, where there has been an increase not only in terms of volume, but especially in value over the period 2014-2018 as shown in Figure 4.

Figure 4 - Main wine exporters (volume and value transactions)

million hl	2014	2015	2016	2017	2018	2018/2014 Variation in %
Spain	23.0	24.7	22.6	23.0	21.1	–8%
Italy	20.4	20.0	20.6	21.2	19.7	–4%
France	14.3	13.9	14.1	15.0	14.1	–1%
Chile	8.1	8.8	9.1	9.4	9.3	15%
Australia	7.0	7.4	7.3	7.8	8.6	22%
South Africa	4.2	4.2	4.3	4.5	5.3	25%
Germany	4.2	3.9	3.6	3.8	3.7	–11%
USA	4.0	4.2	3.8	3.5	3.5	–14%
Portugal	2.8	2.8	2.8	3.0	3.0	5%
Argentina	2.6	2.7	2.6	2.2	2.8	5%
New zealand	1.9	2.1	2.1	2.6	2.6	36%
Moldova	1.2	1.2	1.3	1.4	1.4	19%
World	104	106	104	108	108	3%

billion €	2014	2015	2016	2017	2018	2018/2014 Variation in %
France	7.7	8.3	8.3	9.1	9.3	21%
Italy	5.1	5.4	5.6	6.0	6.1	21%
Spain	2.5	2.6	2.6	2.9	2.9	15%
Australia	1.3	1.5	1.5	1.8	1.8	45%
Chile	1.4	1.6	1.7	1.8	1.7	21%
United States	1.1	1.4	1.4	1.3	1.2	11%
Germany	1.0	1.0	0.9	1.0	1.0	6%
New Zealand	0.8	1.0	1.0	1.1	1.0	20%
Portugal	0.7	0.7	0.7	0.8	0.8	11%
United Kingdom	0.5	0.6	0.6	0.6	0.7	26%
Argentina	0.6	0.7	0.7	0.7	0.7	7%
South Africa	0.6	0.6	0.6	0.6	0.7	12%
World	26	28	29	31	31	23%

Source: OIV (2019b)

Portugal is one of the largest wine producers and consumers in the world in volume, occupying the 12th and 11th position respectively of the 2018 OIV Ranking. In 2018, Portugal produced a total of 6.1 million hectolitres of wine (IVV, 2019a) and consumed 5.5 million hectolitres (see Figure 3). On the other hand, Portugal is the country with the highest *per capita* wine consumption[1].

In relation to international trade, Portugal occupies the 9th position in the world ranking, with 3 million hectolitres exported, valued at 804 million euros (OIV, 2019a). It should also be noted that Portugal occupies the 6th position (OIV, 2019a) in the ranking of countries that achieve the highest added value in wine, selling it at an average of 2.71 euros per litre (IVV, 2019b). Portugal also has 10 companies in the TOP-100 of the most highly rated companies regarding wine quality (World Ranking of Wines & Spirits, 2017).

According to Portugal's Instituto da Vinha e do Vinho (IVV), in 2016 Portugal had 2.357 wine producers and, unlike other countries, there are few large wine producers. In 2015, most of the economic agents of the wine sector in Portugal (75%) were microenterprises[2]. Large companies, which are only 0.8% of the wine sector, have a 22% share of total revenue and small and medium-sized enterprises (SMEs)[3], which represent 24% of companies in the sector, have 70% of the generated turnover. (Lourenço, 2017).

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[1] Information obtained by own calculations, dividing consumption by the overall country population.
[2] Companies that employ less than 10 people and which annual turnover or annual balance sheet total is not more than 2 million euros - Decreto-Lei (decree) n.º 372/2007, de 6th November.
[3] Companies that employ less than 250 people and which annual turnover is not more than 50 million euros or that its annual balance sheet is not more than 43 million euros - Decreto-Lei (decree) n.º 372/2007, de 6th November.

Over the last few years, we have witnessed the increasing advertising of Portuguese wine both domestically and abroad, mainly due to its high economic value and the positive impact it has on the trade balance. The Portuguese Government has given various incentives through programs co-financed by European Union for investment in vineyards and for the internationalisation of Portuguese wine, through the various organizations created, such as ViniPortugal which manages the Wines of Portugal brand.

Thus, there is a significant evolution in terms of the development of the sector in Portugal, which has been marked by an increase in the quality of Portuguese wine and export diversification, maintaining the average of the quantities exported since the beginning of this decade but with greater euro per litre value of wine sold to external countries: from 2.30€/L in 2010 to 2.71€/L in 2018 (IVV, 2019b).

It was the emergence of national players with greater production capacity and above all with greater export capacity that enabled this development and that has led to the successive attribution of many international prizes to Portuguese wines. The main Portuguese wine export markets that shall be highlighted are presented in Table I.

Table I – Amount of wine exported in Portugal in 2018

Country	Hectoliters	Thousand Euros	Average Price (€/L)
France	430,939	115,975	2.69
USA	207,594	80,876	3.90
United Kingdom	219,312	76,070	3.47
Brazil	180,047	51,472	2.86
Germany	265,553	50,069	1.89
Belgium	152,510	49,999	3.28
Canada	126,651	46,611	3.68
Netherland	120,212	42,344	3.52
Angola	227,674	39,608	1.74
Spain	149,129	21,930	1.47
Rest of the world	886,146	228,380	2.58
Total	2,965,767	803,335	2.71

a) Source: IVV (2019b); b) L = Litres

3. Business description

3.1. The wine sector in Portugal and in particular the Tejo wine region

Until the beginning of the present decade, the agricultural sector in Portugal was seen as a traditional activity, merely of subsistence, with low technological development, low productivity, cheap labour work and low levels of education. However, the potential of Portuguese agriculture is quite high and it is possible for it to compete internationally, not in quantity, but above all for the quality of the products. Thus, the Portuguese Government has encouraged the emergence of new farmers and the increase in the scale of others, through the requalification of farms and through stimulus to increase the exports.

The wine sector was one of the most prominent segments in which this occurred. On the one hand, there has been a reduction in the number of wine producers and, at the same time, the maintenance of wine production levels measured in hectolitres, with the emergence of larger market players applying forefront cultivation techniques which result in better yields per hectare. The level of management and marketing knowledge, knowledge of oenology, costs and investments sharing, production size, differentiated infrastructures, and the markets in which they operate have led to the emergence of new partnerships in the wine world to create synergies and scale in the international market (Cardoso, 2016).

In fact, Portugal has always had a great tradition as a wine producer, but

«*after years "sunk" in the production of poor quality wines, in which what mattered was the quantity and not the quality, (…) Portugal began to wake up to a new reality: with the entry in the European Economic Community in 1986 and the existence of new rules, there was a complete change in the Portuguese wine landscape. And wine production started to focus on quality»*

In Almeida (2016) p.11

This change in paradigm has allowed new distribution channels to be opened, particularly for large commercial areas and restaurants. Communication has also changed and had a decisive impact, as the "wine" product, although it may have different attributes such as aromas, is a very homogeneous product in which differentiation is difficult to perceive when purchased by the final consumer. This justifies the appearance of numerous national and international fairs, wine tasting activities, growing demand for associating types of wine to specific food, the effort to associate wine production with a specific history, among others.

The Portuguese territory is divided in 14 wine regions, with 58% of national production in 2018, belonging to Douro, Lisbon and Alentejo Regions, with 3.5 million hectolitres of wine produced (IVV, 2019a). Quinta de Vale de Fornos (Quinta), owned by the Sociedade Agrícola de Vale de Fornos, is part of the Tejo wine region.

In 2018, a total of 635 thousand hectolitres were produced in the Tejo wine region (5th in the ranking of the Portuguese Regions with 10% of the total), of which 120 thousand hectolitres have PDO[4] quality (Protected Designation of Origin), the highest quality certificate that can be obtained in Portugal and that, in this Region, is limited[5] to a maximum harvest of 80hl/ha for red and rosé wine and 90hl/ha for white wine.

One of the reasons why the Tejo wine Region has a low level of production with PDO certification is that it is one of the areas with the highest exploitation rate of the total area of vineyards planted in Portugal (IVV, 2019c). This rate is much higher than average due to its very fertile soils, which explains why companies in the Region produce large quantities of lower quality wine. However, as mentioned above, the Tejo wine Region, as a result of the internationalization effort, has been growing steadily over the years, and in 2018 it increased the PDO production by 37 thousand hl (+ 45%) when compared to the homolog period (IVV, 2019a).

3.2. Quinta's background

Quinta de Vale de Fornos has about 200 hectares and its history goes back to the 18th century when the well-known Dona Antónia Ferreira (Ferreirinha) acquires the Quinta - the only one she would own in the south of the Douro - and has a wine cellar built as a wedding present to her daughter who would marry the 3rd Count of Azambuja.

As mentioned, the SAVF is the current owner of the Quinta. SAVF is a Portuguese family business, under the legal form of a limited liability company, founded in 1986 and whose core business is the production, bottling, marketing and distribution of wine produced on its property that has 48ha of vineyards planted from 13 different varieties, the most representative being Touriga Nacional and Syrah with 37% of the planted area (see Appendix 1). Red wine is the Quinta's main product: 85% of total wine production. Additionally, SAVF has been exploring the sector of social events as a secondary activity, although until the moment this represents only a small part of its revenue.

Usually, wine producers who have bottling activities, such as SAVF, give their wines different names in order to differentiate their quality. In this case, the highest quality and certified wines (PDO) operate under the name "Quinta Vale de Fornos" and the lowest quality, non-certified, "Sol de Portugal". All wines can be sold in bulk to other producers bottlers, but this has not been the company's choice, which has even opted to make its own distribution.

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[4] In Portugal, wines are cataloged under three types of quality certification: "Protected Designation of Origin"(PDO) is the European community designation for highest quality wines (the more ancient regions might use the expression CDP – Controlled Designation of Origin"); "Protected Geographical Indication" (PGI), and "Wine" ("vinho").

[5] Portaria (Governmental Order) 140/2010, 5th March. The Portaria(Governmental Order) nº226/2014, 6th November, regulates the PGI that has a maximum limit for harvesting of 225hl/ha.

Until 2016, the Quinta had only 14ha of vineyards. In order to adapt to new market trends, mainly regarding the differentiation by quality rather than large-scale production, SAVF made an expansionary investment during 2016 and 2017 with the planting of a total of 34ha of vineyards, of which 17ha in the first year and 17ha in the second year, as part of a governmental program to upgrade vineyards to increase production and internationalize the product. It is expected that the new vineyards will only produce quality grapes within 5 years, ie 2021 and 2022, because in the first 3 years the plant has to grow sufficiently to support the weight of the grapes and only after 2 to 3 years will the grape production be consistent and with enough quality for wine production[6].

According to the Quinta's Agronomist, it is possible to extract from each hectare of productive vineyard about 12 tonnes of grapes. The value is higher than the national average but lower than the average of some other areas in the Region, because of the quality and irregularity of the soil and the effort to obtain higher quality vineyards. Thus, after the investment in the new vineyards, a total of 576 tons of grapes is expected to be reached, and it is possible that all the produced wine will be considered of the highest quality by the Tejo Regional Wine Commission (CVRT).

Using as a coefficient of transformation of grape yield into 0.75 litres of wine, the company expects to increase its wine production from the current 1.260hl to 4.320hl in 2022, which corresponds to a 243% increase.

Figure 5 - Evolution of grape yield by hectare of productive vineyard
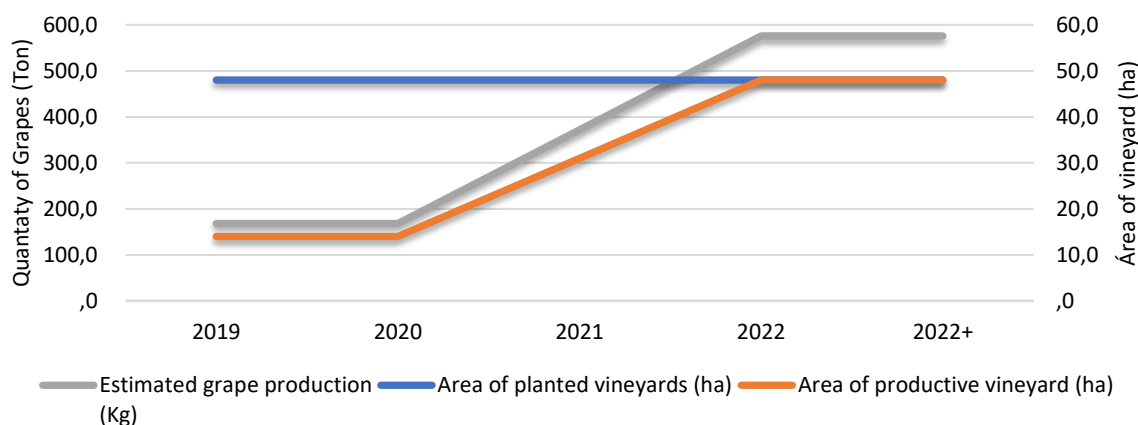
Source: Prepared by author

During 2018, there was a change in the corporate structure that led to the entry of new partners whose knowledge of the wine sector was scarce and, therefore, it is imperative to define a strategy to continue the expansion process, adapt the facilities to the increase in the production that is underway, and above all, to understand if the business will be profitable.

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[6] Based on the Portaria (Governmental Order) nº140/2010, 5th March.

3.3. Sociedade Agrícola de Vale de Fornos performance analysis

The performance of the Sociedade Agrícola de Vale de Fornos can be seen through the evolution of the Income Statement and Statement of Financial Position from 2016 to 2018 which are detailed in Appendices 2 and 3, respectively.

The company's revenue amounted to 165.284 euros in 2018, a 4.2% growth compared to the same period of the previous year, in contrast to the largest increase between 2017 and 2016 in which revenue increased 34.347 euros (27.6%). The operational government grants reflect the support given under the requalification, planting and internationalisation program that the company started in 2016, and they will be reflected in the financial statements until 2020, since only from 2021 the new vineyards will become available for wine production.

In 2016, operating expenses amounted to 343.848 euros. Since then, they have decreased by an average of 33.875 euros per year (10.4% per year), reaching in 2018 the lowest level with a total of 276.099 euros. Figure 6 shows that external supplies and services was the heading with the most significant contribution to cost reduction because in 2016 specialised external services were contracted to implement the above mentioned program.

The Costs of Sales and Supplies and Services headings equalled 159.236 euros in 2018. The Costs of Sales include costs for vineyard and winery maintenance (31%), harvesting (6%), winemaking costs (13%) and costs with materials used in bottling (29%) and labelling (14%) of the containers where the wine is placed. The Supplies and Services include costs related to vineyard and harvest insurance (19%), trading and marketing (27%) and electricity (12%) (see Appendix 2).

Figure 6 - SAVF operacional costs
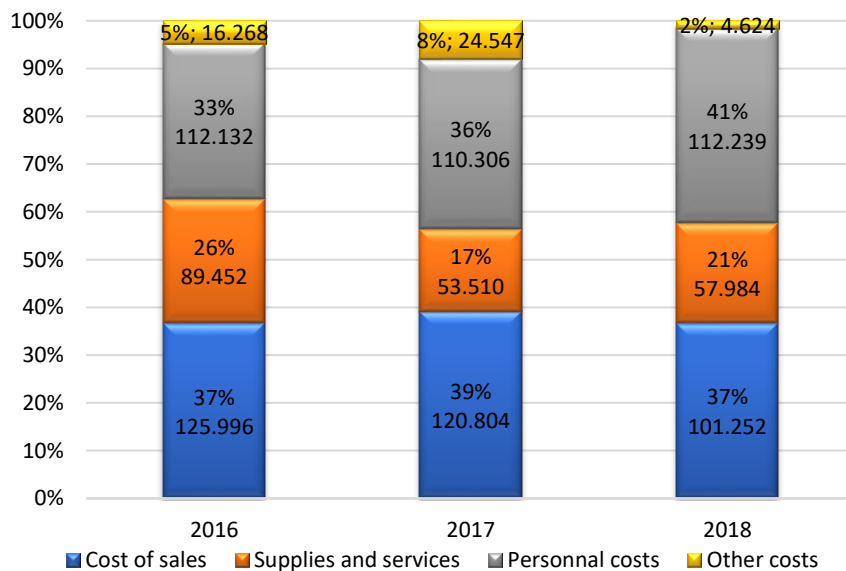
Source: Prepared by author based on the information presented in the Appendix 2

Also noteworthy is that EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization) is positive every year, mainly as a result of the operational government grant that the company received and which will be reflected until the new vineyards start to be explored. Excluding this effect, EBITDA has always been negative, meaning that the company is not generating operational value and therefore is unable to cover its current expenses, as can be seen in Figure 7. Furthermore, despite a significant improvement due to reduction in costs, business expenses are only covered 36%, 51% and 60% by revenue in 2016, 2017 and 2018, respectively. This is the main reason why financial debt increased every year until 2018.

Figure 7 – Coverage of operating costs by revenue
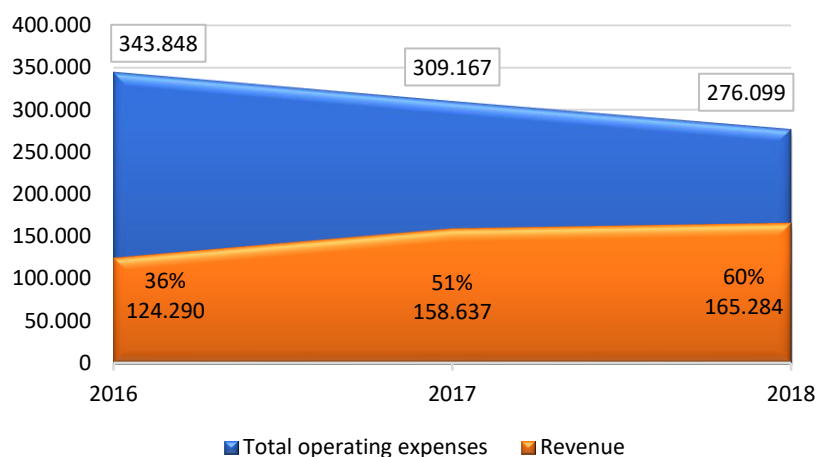
Source: Prepared by author based on the information presented in the Appendix 2

In fact, the company's past investment targeting the expansion of its cultivation area led the company to present a difficult and financially unstable situation in the years when, on the one hand, it is already bearing the operational costs (at least in part), and on the other hand, still does not have enough financial return to support it. Additionally, it is also understood that the cost structure is not appropriate for the sector as we will have the opportunity to understand further below.

In an attempt to better understand the company's delicate situation, we present below the functional balance sheet:

Table II - Funcional Balance Sheet

	2016	2017	2018
Working capital	**(496,713)**	**(381,887)**	**(212,010)**
Non-current assets	1,336,572	1,310,941	1,291,856
Non-current liabilities	51,732	96,232	223,961
Equity	788,127	832,822	855,885
Working capital requirements	**(501,787)**	**(394,919)**	**(201,195)**
Remaning assets	241,631	237,470	201,745
Remaning liabilities	743,418	632,389	402,940
Net Treasury	**5,074**	**13,032**	**(10,815)**
Cash and cash equivalents	5,074	13,032	5,224
Current Financial Debt	-	-	16,039

Source: Prepared by author based on the information presented in the Appendix 3

When the company has negative working capital, negative working capital needs and negative net treasury, this is a typical case of a company with excessive growth taking into account the insufficient permanent capital (Neves, 2012). This is exactly the case of SAVF because it adopted an aggressive strategy to increase its production capacity, when it planted 34 hectares more of vineyards, corresponding to an increase of 234%. This situation should not change at least until the vineyards enter their productive cycle.

Table III shows SAVF's economic and financial indicators as well as those of the largest national player in the sector and the wine sector average:

Table III - Main performance indicators - SAVF vs Largest portuguese player

Type of indicators	Indicators	SAVF			Largest portuguese player			Sector average
		2016	2017	2018	2016	2017	2018	2015
Financial indicators	[1] Debt Ratio	50.2%	46.7%	42.9%	33.9%	35.3%	36.2%	-
	[2] Financial Debt in % of liabilities	6.5%	13.2%	37.3%	28.6%	29.0%	38.8%	55%
	[3] Debt to Equity Ratio	100.9%	87.5%	75.1%	51.2%	54.6%	56.7%	-
	[4] Financial Autonomy	49.8%	53.3%	57.1%	66.1%	64.7%	63.8%	52%
Economic indicators	Revenue growth rate	-	27.6%	4.2%	-	-5.1%	-3.8%	-
	Operating cost growth rate	-	-10.1%	-10.7%	-	-2.1%	-6.8%	-
	[5] EBITDA margin on Revenue	70.5%	61.9%	45.3%	19.7%	17.3%	19.6%	14%
	[6] EBIT margin on Revenue	41.9%	40.1%	35.5%	14.7%	13.1%	14.4%	-
	[7] Return of revenue	36.1%	33.1%	19.5%	10.4%	8.7%	9.2%	-
Economic-Financial Indicators	[8] Return on Equity (ROE)	5.7%	6.3%	3.8%	8.4%	6.7%	6.8%	5%
	[9] Return on Investment (ROI)	3.1%	3.6%	2.7%	7.8%	5.9%	6.4%	-
	[10] Asset Turnover	10.4%	26.5%	18.9%	53.4%	49.6%	47.2%	-

Sources: a) Prepared by author based on the information presented in Appendix 2 and 3I; b) Formulas used to calculate the indicators: see Appendix 4; c) Annual Report for 2017 and 2018 of the largest national player; d) Sector Average – According whit Lourenço (2017).

The analysis of the various economic and financial ratios allows us to identify the main virtues and shortcomings in management, both through the return on capital invested and return on sales ratios. Nevertheless, they are as important or even more important when they can be compared with companies and the sector in which they operate (Neves, 2012).

Debt ratios, Financial Autonomy and Debt to Equity ratios have evolved favorably for SAVF, but are very different for the largest national player and even for the sector average. The growing increase in remunerated debt (bank debt) coupled with the above ratios shows that the company will find it increasingly difficult to obtain funding and difficult to pay its suppliers, staff and other creditors. On the other hand, the growing improvement in debt to equity ratio indicates that SAVF may reach financial equilibrium and even some solidity when new vineyards start to produce.

4. Definition of the investment strategy

4.1. Competitive analysis

An investment consists of devoting resources in the acquisition or construction of real assets for the purpose that they generate future economic benefits over a certain period of time. An investment project consists of the systematic collection, compilation and treatment of all the necessary elements with the aim of deciding on a particular investment, including market studies, provisional cash flow maps, rates of return, among others (Mota et al, 2015).

The best strategy for a company will be one that will ensure, in the long-term, an above-average performance. According to Michael Porter (1985), quoted by Santos (2008), to identify the best strategy of a company it is important to understand the internal and external context in which it is inserted, and from the analysis of the scenarios presented, define what its competitive advantage is. When a company can «*define its positioning correctly, it can achieve high rates of return, even with an unfavourable industrial structure, with low profitability*» (Santos, 2008).

Therefore, we present below two models of competitive analysis that will help the decision making regarding the best strategy to be adopted by SAVF, identifying the market segment in which the company is more competitive.

4.1.1. Porter's five forces model

For Porter (1980), the five competitiveness factors are rivalry among existing competitors, the threat of substitute products or services, the threat of new entrants, and the bargaining power of suppliers and of customers. Figure 8 presents the analysis performed:

Figure 8 - Michael Porter's Five Forces analysis

Bargaining power of suppliers: **LOW**	• Many suppliers exist and there are no switching costs; • The essential products supplied are homogeneous for suppliers, the major differentiating factor being the price.
Bargaining power of customers: **GROWING**	• Sales to producers: Better winery years (+ production) make bulk sales difficult, regardless of quality; • Consumer has more knowledge about the type of wine and prefers quality; • Quality/price factor is decisive in the consumer choice (increased sales in distribution channels such as hypermarkets); • Standardised product, dificult to choose before consumption.
Threat of new entrants: **LOW**	• Need for a large initial investment to gain scale; • Financial Return is not immediate (minimum time for quality grape production is 5 years).
Rivalry among existing competitors: **HIGH and GROWING**	• High reputation of competing brands; • Industry growth rate according to consumption and production data (mature market); • Tendency to reduce the number of individual producers to gain national and international scale; • Existence of many larger scale wine producers; • Inexistence of exit barries.
Threat of substitute products: **HIGH**	• Existence of many producers with products of similar quality; • Existence of several types of light alcoholic drinks; • Existence of a wide variety of wines (red, rosé, white, sparkling); • Tendencies/Fashion.

Source: Prepared by author

4.1.2. SWOT analysis

SWOT analysis is a scenario analysis tool used to identify strategies for an organization to adopt, according to the specific situations of the economic context in which it is inserted (Pearce & Robinson, 1991). In Figure 9 we present an analysis of SAVF's internal and external environments, indicating the strengths and weaknesses of the company combined with the opportunities and threats in the market where it operates.

Figure 9 - SWOT analysis

SWOT MATRIX	OPPORTUNITIES (O)	TREATHS (T)
	1. Government incentives for modernization and exportation; 2. Increasing notoriety of Portuguese wine and consequent increase in external demand; 3. Growing number of national and international events for the promotion of wine; 4. Growing interest in higher quality wines (change in drinking habits); 5. Portugal is the largest consumer of wine *per capita*; 6. Economic environment (lower interest rates, more investment); 7. Appearance of new wine tourism businesses and social events.	1. World wine consumption without significant variations in the present decade; 2. Producers with large productive capacity; 3. Unstable weather conditions; 4. Wide range of substitute products; 5. Lack of labour force in the sector (harvesting).
STRENGTHS (S) 1. Wide diversity of varieties that enhance innovation and development; 2. PDO certified quality vineyard; 3. Productive capacity; 4. Dimension of existing physical space; 5. Building for events and lodging.	**SO STRATEGIES** • Attracting new customers through participation in various national and international wine fairs and tastings (S1-O3); • Investment in the wine cellar to accommodate the increase in grape production, taking advantage of historically low interest rates (S4-O6); • Bottle wine for sale in the foreign market (S2-O2); • Promote the wine tourism activity and social events such as weddings (S5-O7).	**ST STRATEGIES** • Creation of new quality wines from different varieties (S1- T4).
WEAKENESSES (W) 1. Lack of specialized personnel in the distribution area (internal and external); 2. Negative operational costs (excluding operational subsidies); 3. Relatively low production scale; 4. Low brand notoriety.	**WO STRATEGIES** • Establishment of partnerships to sell different quality bulk wine (W3-O4); • Investment in hiring specialized personnel for sale in foreign markets (W1-O2); • Conducting brand promotion marketing campaigns and purchase of bulk wine to gain scale (W4-O3).	**WT STRATEGIES** • Cost rationalization for marketing investment (W2-T4); • Sale of wine (in bulk or bottled) with reduced quality (W4-T1).

4.2. Definition of the strategy and change in paradigm

The context of SAVF is complex because, as mentioned previously, in 2016 it started an investment by planting dozens of hectares of vineyards that will only have some long-term return if, by 2021, SAVF adapts your winery to meet the increase in production. To this, other investments may be added for example in the bottling assembly line and in the marketing and distribution channels.

After analysing the models presented above, it can be concluded that the company structure does not allow to respond to the current reality of the sector, as it doesn't have the capacity to develop all the activities of the "wine" product value chain (vineyard planting, harvesting, wine processing, storage, bottling, distribution and trading).

In this regard, the following critical success factors are highlighted: (1) The vineyards planted, with its existing varieties, many of which are traditionally associated with the highest quality grapes and wines, make it possible to produce superior quality wines that follow internal and external market trends; (2) The location of the vineyards allows a higher wine production per hectare, higher than the national average, boosting not only the quantity of produced wine considered to be of superior quality, but also the trading of the remaining wine (with middle quality - PGI), whose market share is still significant (IVV, 2019a), especially in the Tejo wine region.

On the other hand, its main uncertainties result from (1) the fact that the wines that are produced on the Quinta are not well known enough to achieve a prominent position in the market motivated by the wine location in which it operates and the lack of investment in marketing and (2) the difficulty of entrance in internal and especially external distribution channels, which is the trend of the market and where the highest quality portuguese wine has stood out.

Taking this into account, using market opportunities and focusing on its strengths, the company's strategy will be to produce bulk wines of various quality levels, selling all the wine produced and identifying business partners that have greater bottling and internal and external distribution capacity in order to support the increased external demand of portuguese wine, maximizing the installed capacity in the Winery. Due to the poor reputation of the SAVF' wine brands and the need for a large marketing investment, the company will stop producing under its own brand, therefore decreasing its exposure to the identified fragilities.

This option requires an investment in the Quinta's winery, the purchase of winemaking equipment and the acquisition of a new tractor to support increased production, and the closure of bottling and distribution activities (sale to several small customers, such as restaurants).

Finally, the company will not invest in the wine tourism area because of the need for investment in the renovation of the building, which should be channelled to the areas identified above. However, it will maintain the existing secondary activity, taking advantage of the space available for social events, using the existing contact network (no new investments required), and to cover some operational costs.

5. Literature review

5.1. Valuation methods

The evaluation of a company or business is a tool to support decision making about an investment project. Thus, the purpose of an assessment is to determine whether value creation exists, that is, whether the benefits outweigh the costs, taking into account their particular (internal and external) context.

However, companies and businesses evaluation exercises take into account several subjective assumptions made by the assessor, and it can be argued that they involve scientific methods whose inputs are primarily an opinion of the assessor. Besides the different perspectives of observers, there are different scientific methods of evaluating companies, so it is likely that different values may be attributed to the same set of assets.

As it was already mentioned, there are different evaluation methods, depending on their use by the evaluator according to their objectives and the level of complexity that they intend to adopt. According to Neves (2002) the following evaluation methods can be used: balance sheet, market, discounted cash flows, real option and regulatory. The last two will not be addressed in this study.

5.1.1. Balance Sheet aprroach

The evaluation of companies according to the balance sheet perspective implies the use of accounting information of companies and, according to several authors such as Neves (2002) and Fernandez (2007), this is precisely its major limitation.

The balance sheet-based evaluation models most relevant are as follows:

1) Book value;
2) Adjusted book value;
3) Substantial value;
4) Settlement value.

Balance sheet-based evaluation models are simple and easy to apply because they are essentially based on the company's financial statements, a source that is easy to obtain. However, they have several limitations, because on the one hand a good part of the assets and liabilities are stated at their historical cost and, on the other hand, the recognition and measurement rules for the purpose of preparing accounting financial information are quite differentiated, for example: how the company values its inventory; the valuation and amortization method of tangible and intangible assets; cost and income estimates; the registration of operational government grants; the capitalization of interests and work for the enterprise itself in tangible assets; among others.

Thus, Neves (2002) states that even using the adjusted book value method (at a fair value), which among the above models is the most used (in general, the accounting elements should be removed from assets and non-business liabilities), such balance sheet-based approach are not the best suited for evaluating companies, as they are the result of a static evaluation and, from a continuity perspective, do not show the ability of a company or business to generate value. Moreover, another criticism that is made of these evaluation methods is that they do not reflect a set of other important factors in the valuation of a company, namely its market context, human resources capacity and organizational structure (Fernandez, 2007).

It should also be noted that although it is quite limited, balance sheet evaluation ends up being widely used in companies' evaluation, at least as a starting point because, according to Neves (2002), it requires identifying all assets and liabilities that integrate a company's equity and that makes it possible to identify accounting gains and losses in the event that the purpose is to sell or restructure part of the assets and liabilities (which is reflected in the calculation of profit tax), factors that are determinant for one to get to know the reality of a company.

5.1.2. Market approach

Market evaluation, better known as market multiples, is based on the comparison of companies using financial performance ratios, the interpretation of which will only be relevant when the comparison is made between comparable companies (sector of activity and risk). There are two types of ratios (Suozzo, 2001): equity value multiples and enterprise value multiples. The first only allows us to analyse the value of the company according to equity, while the second allows us to analyse the entire value of the business without giving consideration to its capital structure, which is one of the reasons why its possible to argue that enterprise value multiples are more accurate than equity multiples (Koller et al, 2015). The other reason is that profit is often affected by non-systematic gains or losses, as opposed to EBITDA or sales.

According to CFA[7],the most widely used equity value multiples are Price-Earnings Ratio (PER) and Price Book value (PBV), while the most widely used enterprise value multiple are Enterprise Value to EBITDA and Enterprise Value to Revenue.

PER relates the market value of the share in stock with the company's net result per share (EPS - Earnings Per Share), being that the average of existing shares for the reporting period should be used because various events such as increases and capital reductions losses may occur (Neves, 2012). The multiple PBV differs from PER, as what is intended is to relate the market value of the share with the company's book value per share, and the equity value is now present in the denominator of the equation instead of the net result.

Enterprise Value to EBITDA relates the number of shares multiplied by share price minus net debt (total debt plus cash) with EBITDA. The Enterprise Value to Revenue formula is similar but uses as its basis of comparison Revenue.

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[7] Corporate Finance Institute – Types of Valuation Multiples. Available in:
https://corporatefinanceinstitute.com/resources/knowledge/valuation/types-of-valuation-multiples/
[Access in:01.08.2019]

Is should be noted that the multiples method is very much used in investment banking and equity research and shall be viewed as a kind of pre-assessment of a company as it is easy to apply and has reasonable results when properly applied. However, although they are widely used and accepted in the business world, they do not take into account the intrinsic value of a company, which is examined through the DCF approach.

5.1.3. Discounted Cash Flow aprroach

A According to several authors, including Brealey & Meyers (2003), Discounted Cash Flows approach is the best method of evaluating companies although it is much more complex compared to the other methods mentioned above. This model is based on the rationale that the viability of financial investments results from the comparison between costs and associated returns and that these financial flows are generated and differentiated over time, becoming necessary to consider the opportunity cost of money over time and the risk of uncertainty on the realization of these same flows (Soares et al, 2008).

In summary, this model is based on the Net Present Value (NPV) calculation. This methodology is applicable to a time series of cash-flows (incoming or outgoing) and can be defined as the sum of the present values (including the initial investment or additional investment under the project, if applicable) of these cash flows. It compares the present value generated by the investment project with the investment made. The NPV is calculated according to the following formula:

$$NPV = \sum_{n=1}^{N} \frac{CF_n}{(1+r)^n} - C_0$$

Where:

C_0 - Initial investment;
CF_n – Cash flow in year n;
r - Discount rate;
n – Number years of the project.

According with Brealey & Meyers (2003), if the net present value of an investment is negative, the project should be reject. If the net present value of an investment is positive, we should invest on it because the benefits generated by the project are bigger that the costs generated by its implementation.

It is also important to note that there are additional criteria that allow us to compare two positive NPV investment projects:

1) IRR – Internal Rate of Return:

The IRR of an investment is the rate of return that makes NPV equals to zero when considering all cash flows associated to an investment. We obtain the IRR using the follow expression:

$$NPV = \sum_{t=0}^{n} \frac{CF_t}{(1 + IRR)^t} - C_0 = 0$$

Where:

NPV – Net present value;
CF_t – Cash flows in year n;
IRR – Internal rate of return;
C_0 – Initial investment

We should accept investments that offer greater internal rates of return than their opportunity costs of capital. However, IRR has some disadvantages such as the assumption that the generated cash-flows are reinvested on the same IRR (or discount rate) and IRR doesn't give us information about the investment project lifespan (Soares et al, 2008). For higher risk levels, i.e. higher cost of capital rates, investors require higher IRR (Neves, 2005).

2) Payback period:

The Payback period of a project is the number of years that is necessary to recover the investment made in the investment project. We must choose the project whose recovery period is shorter. However, this model favours shorter projects and investments that generate higher cash flows in the first few years. (Soares et al, 2008). According to the same authors, the Payback period ignores the time value of money.

5.2. Discounted Cash Flow models

In this work we will use the Discounted Cash Flow as an evaluation method, using three different models that allow us to calculate the NPV of the SAVF project: the Weighted Average Cost of Capital (WACC) using the Free Cash Flow to the Firm (FCFF); the Adjusted Present Value (APV); and the Free Cash Flow to Equity (FCFE).

We also intend to demonstrate that, according to Damodaran (2005), by using any of the above mentioned methods it is possible to conclude in a similar way about the NPV of an investment project in all the cases where debt to equity is constant over the lifespan of the project.

5.2.1. Cost of capital

One of the most important decisions in an investment project is how it will be funded. Investors may choose from three sources of funding for their investment: internal, in which the company self-finances, using only its own means; external, in which the company is funded exclusively through debt; or the most common, using both forms of funding.

5.2.1.1. Cost of equity

When a company finances itself with the use of equity, its cost represents the rate of return required by shareholders to reward their own equity, this is, it represents the return that the shareholder is willing to accept in order to have the asset and assume the risk. Hereafter this rate will be referred to as R_e.

The most common way to determine the R_e rate is by using the CAPM (Koller et al, 2015). The commonly used Capital Asset Pricing Model (CAPM) was developed simultaneously by Sharpe (1964) and Lintner (1965) and, according to it, the profitability of an asset or portfolio is linearly related to a beta coefficient, known as risk factor. The inputs required for its use consist of (i) obtaining a risk-free interest rate (R_f), i.e. the theoretical interest rate at which an investor may invest without risk of not getting repaid for the invested capital and interest at maturity, in (ii) obtaining the company beta (β), used as an indicator of volatility against the benchmark, that measures the systematic risk (uncontrollable) of the market in which the company operates and (iii) the calculation of the risk premium, which is the result of the difference between the market risk and the R_f rate, or, to put it another way and according to Neves (2012), the risk premium is the increase in the return of the market portfolio against the risk free interest rate, as a way of offsetting the additional risk.

According to this model, the expected rate of return on any security is equal to the risk-free rate plus the security's beta multiplied by the market risk premium, as we can see below:

$$E(R_i) = R_f + \beta_i\big[E(R_m) - R_f\big]$$

Where:

$E(Ri)$ - Expected return of stock i
R_f - risk-free interest rate
β_i - stock's sensitivity to the market
$E(R_m)$ - expected return of the market
$E(R_m) - R_f$ - market risk premium

For the risk-free interest rate, it is usually considered a yield on a treasury bond (should be used a yield that tracks the lifespan of the investment project). The beta is obtained by doing statistical regressions using historical data based on the industry. The most common method to estimate the market risk premium is performed through measuring and extrapolating historical stock returns.

5.2.1.2. Cost of debt

The cost of debt is defined as the effective rate that a company pays on its current debt. When the company issues debt in the financial markets (bonds) and this is its main source of funding, the market value of bonds should be used as a reference to calculate the cost of debt. However, if the company only funds itself through bank debt, the interest rate paid for that debt shown in the income statement is used as a reference. Hereafter the cost of debt will be referred to as R_d.

5.2.2. Weighted Average Cost of Capital

As mentioned above, the updating of all cash flows associated with an investment project implies the determination of a discount rate. This discount rate is usually the result of the average cost of the two types of funding identified above, designated by WACC. The WACC discount rate is obtained by weighting the cost of third-party equity and the cost of own equity, consistent with the company's financial structure, according to the following formula:

$$WACC = \frac{D}{V} R_d (1 - T) + \frac{E}{V} R_e$$

Where:

D – Debt;

E – Equity;

V - D+E;

R_d - Cost of febt;

R_e - Cost of equity;

T_m - Corporate tax rate.

5.2.3. Free Cash Flow to the Firm

Free Cash Flow (FCF) is the cash flow that is available to compensate shareholders and external funders of the company, after the investment made (Soares et al, 2008), thus representing the value generated by the net flows of investments in assets and working capital needs necessary for the development of the investment project.

The FCF is calculated according to the following formula:

$$FCF = EBIT (1 - T) + A - \Delta NWC - C$$

Where:

$EBIT$ – Earnings before interest and taxes;

T – Corporate tax rate;

A – Amortizations and depreciations;

NWC – Net working capital;

C – Capex.

The Free Cash Flow to the Firm (FCFF) method can be presented as the process of actualizing FCF that uses WACC as its actualizing rate. The FCFF is calculated according to the following formula:

$$FCFF = \sum_{t=1}^{t=n} \frac{FCF_t}{(1 + WACC)t}$$

Where:

FCF – Free cash flows;
WACC – Discount rate.

5.2.4. Adjusted Present Value

The APV model is an alternative model to the FCFF model developed by Brealey-Myers, based on Modigliani & Miller (1958) theoretical basis, that allows the separation of investment and financing decisions (Neves, 2002). However, when compared to FCFF, APV is more difficult to implement as its calculation is less practical.

The NPV calculation corresponds to the sum of the NPV of unleveraged investment (100% equity) and the current value of tax savings. The APV is calculated according to the following formula:

$$V_L = V_U + PVITS$$

Where:

V_L - Net present value;
V_U – Unlevered value of the firm;
PVITS – Present value of the interest tax schield.

The unlevered value of the firm is determined, discounting the free cash flows at the unlevered cost of capital: the Pre-Tax WACC (same as presented in the WACC formula without the tax component). As there are tax benefits arising from the use of external funds, the present value of the interest tax shield[8] (ITS) is then determined, first obtaining the levered value for each investment period (that decreases as the project gets more near the end of its lifespan as debt is not permanent) by updating the FCF in accordance to the cost of debt.

The debt capacity was then calculated by multiplying, for each period, the Levered Value by the debt weight, verifying its decrease as the project approaches to the end of its lifespan. Afterwards we calculate the interest paid, which is the interest paid in the period of the previous period debt, multiplying the debt capacity by the rate R_d. Finally, the interest paid is multiplied by the tax rate in force.

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[8] ITS is the reduction in corporate taxes due to the tax deductibility of interest expenses (Modigliani & Miller, 1963)

5.2.5. Free Cash Flow to Equity

The Free Cash Flow to Equity (FCFE) method derives from the FCFF and allows you to check what flow is generated for shareholders, taking into account all receipts and payments to and from debt holders (Soares et al, 2008). The FCFE is calculated according to the following formula:

$$FCFE_t = FCF_t - I_t(1 - T) + D_t$$

Where:

FCF – Free Cash Flows;

I – Interest expenses;

T – Corporate tax rate;

D – Net borrowing (difference between the level of debt of the year with the previous year)

To compute the NPV using FCFE, the free cash flows are discounted at the equity cost of capital (R_e).

6. Valuation

In the financial world, Discounted Cash Flow is the most commonly used method for evaluating investment projects and companies. Therefore, in accordance with best practices, SAVF's valuation will be made according to the above method. Additionally, the present work also aims to demonstrate that, by maintaining a constant debt to equity over the project time, it is possible to obtain the same results and, consequently, the same conclusions as using any of the three discounted cash flow models already mentioned: FCFF, APV and FCFE.

6.1. Forecasting assumptions

The investment project will start in 2019 and cash flows have been estimated until the year 2028. The period of this project is relatively long as business in the wine sector have as one of its main characteristics its duration over time, i.e., the payback period is usually very long compared to other sectors of activity, so the option for a shorter period of time would not be the most appropriate. The free cash flows forecasted output are presented in Appendix 5 and the Income Statement, the Statement of Financial Position and the Functional Balance Sheet forecasted are present in Appendix 6, 7 and 8 respectively.

6.1.1. Investment summary

The planned investment amounts to a total of 280,000 euros (residual value equals to zero) and consists of the expansion of the winery, the purchase of winemaking equipment and a new tractor. All the investments aim to support the expected increase in production. Table IV below shows in detail each of the identified items:

Table IV - Investment detail

Investment detail	Amount in Euros	Annual Depreciation Rate (%) *
Winery expansion	**50,000**	**2.5**
Winemaking equipment	**160,000**	**6.25**
Silo	6,500	
Grape conveyor belt	10,900	
Pick table	5,100	
Unloading and cooling vats 40.000 Lt (5)	38,000	
Wine transfer pump and several pipes	12,000	
Stainless steel tank 75.000 Lt (5)	87,500	
New trator	**70,000**	**8.33**
Total investment	**280,000**	

*Minimal depreciation rate according with Regulatory decree nº25/2009, 14th of September

The investment included in the project will be funded by shareholders' own capital in a total of 186,666 euros and external bank funding of 93,334 euros. The interest rate associated with bank funding is 7.5%.

Below the main indicators and assumptions used for the evaluation are presented.

6.1.2. General indicators

Cash flow projections are based on the following indicators:

1) The evolution of the wine production having as basis the year 2018, is 0% in 2019 and 2020, 121% in 2021 and 243% in 2022 and following years, as it can be seen in the Appendix 1. Each hectare of vineyard produces a total of 12.000 kg of grapes, with the winemaking coefficient (transformation kg in liters) being 0.75, translating into a total of 9.000 litres per hectare. The productive vineyard area is 14ha in 2019 and 2020, 31ha in 2021 and 48ha in 2022 and following years;

2) The estimated inflation rate was obtained through International Monetary Fund projections for the first 6 years of the project and, for the following years, we have used the estimated inflation rate observed in the 6th year, as it can be seen in the following table:

Table V - Estimated Inflaction Rate

Description	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Inflaction rate	1.00%	1.60%	1.70%	1.80%	1.90%	2.00%	2.00%	2.00%	2.00%	2.00%

Source: International Monetary Found (2019)

3) Taxes[9] were calculated based on the current corporate income tax (IRC) rate applied in Portugal, plus surcharge (derrama - municipal tax). IRC rates are 17% for the first 15.000 euros of earnings before taxation and 21% for the remainder. The applicable surcharge rate (derrama) is 1.5%. Although the company has accumulated losses from previous years (negative accumulated retained earnings) it was considered that the company has no tax losses to use in the future as it has already used them in 2016 and 2017;

4) Funding obtained is repaid with constant capital instalments, and are repaid in 10 years, except for the new funding that has a 12-month grace period. The company has hired a credit facility by the end of 2021 to prevent negative treasury (interest: 5%);

5) The company recognizes a total of 150,000 euros per year for operational government grants up to 2020, the last year before the new production area starts operating.

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[9] Source: PWC Portugal (2019)

6.1.3. Revenue

Estimated revenue for the period 2019-2028 includes the sale of bulk wine (red and white) and holding social events at the Quinta's premises. During 2019, SAVF will be sell all the bottled wine in stock.

Estimated value of bulk wine sales varies with the evolution of grape production at the Quinta. The Quinta will only sell its own production, both PDO and PGI. PDO wine production is limited to 8.000 litres for red wine and 9.000 litres for white wine, so the remainder production will be of PGI quality (by choice the company will not produce wine non-certified). It is assumed that the average reference prices for the highest quality bulk wine (PDO) in 2018 is 0.95€/L and the middle quality (PGI) is 0.65€/L. These prices are actulized according to the expected evolution of the inflation rate.

The company will also explore the rental of spaces at the Quinta for social events, valued at 3.000 euros each, with 5 events expected in 2019, 6 events for 2020 and 2021 and 7 events for 2022 and beyond. The margin in this business is 50% and the price update is based on the inflation rate.

6.1.4. Cost of sales

Estimated cost of sales include costs for vineyard maintenance, harvesting, winery maintenance and the winemaking process.

All costs are updated annually according to the inflation rate and, in some cases, also according to the evolution of production, namely: plant protection products; winery maintenance and oenological products. Despite the estimated increase in production, the company opts to lease machinery to support growth while keeping external labour unchanged. Fertilizers will be added initially in 2021 and thereafter every 3 years.

6.1.5. Other operational income and costs

Regarding the other headings that complete the EBITDA, an annual price increase indexed to the inflation rate was considered each year.

As established in the business strategy, the company will no longer sell bottled wine, so marketing costs will be significantly reduced, and from 2020 onwards they will only include costs with offers and samples.

The increase in personnel costs in 2021 is justified by the hiring of two new farmers (the decrease in 2020 are justified by dismissal of the commercial manager). Since the objective is to sell the product to major national players, contacts and commercial activity will be performed by the Quinta's Agronomist (which is also Oenologist).

6.1.6. Net working capital

The calculation of working capital requirements was based on the functional balance sheet estimated for the period 2019-2028. As can be seen from Appendix 8, and reinforcing what was previously mentioned, the company presents an imbalanced financial situation until 2021, as net treasury negative (in 2018, all cycles were negative). From 2022 until the end of the reporting period, SAVF enters in a state of financial equilibrium as the investment cycle, operating cycle and treasury itself are positive and the working capital exceeds the working capital needs, meaning that permanent funds are sufficient to finance the company's operating cycle (Neves, 2012).

It should also be noted that in this project, we have considered that the average customer receipt period remained stable at 68 days (69 in 2018) and the average payment period to suppliers increased from 63 days in 2018 to 74 days from 2019 and until the end of the investment project.

6.1.7. Other assumptions in the Statement of Financial Position

In order to make the forecast of the Statement of Financial Position the most important assumptions were the following:

1) The intangible assets are totally amortized in 10 years and the biological assets are constant over the period;
2) The "Inventory" heading corresponds to 1/12 of the total cost of sales for each year;
3) The other current assets and liabilities decrease 10% each year.

6.2. Discounted Cash Flow assumptions

To perform the Net Present Value (NPV) calculation, using the different evaluation models, the following assumptions were assumed:

a) Cost of equity - $R_e = R_f + \beta_e * (R_m - R_f) - 8.273\%$;
b) R_f - Portugal 10 year Government Bond as of 30th April 2019[10] - 1.12%;
c) β_e - Levered Beta[11] - 1.3;
d) $R_m - R_f$ - Historical Portugal R$isk\ Premium$[12] - 5.5%;
e) Cost of debt - R_d = Interest rate bank loan in 2018 (last year) – 7.542%.

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[10] Source: Investing.com (2019)
[11] Source: Damodaran (2019)
[12] Source: Neves (2012)

6.3. Discounted Cash Flows analysis

6.3.1. Valuation using FCFF/WACC model

To calculate the business net present value is necessary to calculate the discount rate of the investment project using the WACC method and the free cash flow to the firm.

Table VI - WACC inputs

Amounts expressed in Euros

Description	2016	2017	2018	Average
Equity	879,500	879,500	879,500	**879,500**
Debt	51,732	96,232	240,000	**129,321**
Cash	5,074	13,032	5,224	**7,777**
Net Debt	46,658	83,200	234,776	**121,545**
Net Debt plus Equity	926,158	962,700	1,114,276	**1,001,045**
Debt-to-Equity	0.0531	0.0946	0.2669	**0.1382**
Net Debt weight	0.0504	0.0864	0.2107	**0.1158**
Equity weight	0.9496	0.9136	0.7893	**0.8842**
Cost of Equity (R_e)	8.273%	8.273%	8.273%	**8.273%**
Cost of Debt (R_d)	7.000%	7.231%	7.542%	**7.393%**

It is important to clarify that the calculation of pre-tax WACC rate and WACC rate was based on the average debt and equity weights. However, in the case of the cost of debt, the cost of 2018 was used as it is the closest to the current reality, as financial entities do not lend money on the basis of the past. The cost of equity is constant over time.

The pre-tax WACC rate obtained is 8,188% and the WACC rate (which includes the corporate tax rate) is 7,992%.

The next step was to calculate the FCF that the project is estimated to generate. Thus we obtained the following:

Table VII - Free Cash Flows calculation

Amounts expressed in Euros

Description	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
EBIT	151,888	153,782	82,493	96,803	98,707	92,510	105,869	107,843	102,061	115,733
Taxation (T)	31,717	28,800	13,495	17,844	19,008	18,350	21,819	22,726	21,889	25,123
EBIT (1-T)	120,172	124,982	68,997	78,958	79,699	74,161	84,050	85,117	80,172	90,610
Depreciations	33,182	33,182	33,182	33,182	33,182	33,182	33,182	33,182	33,182	33,182
CAPEX	280,000	0	0	0	0	0	0	0	0	0
Δ Net working capital	40,577	142,551	46,517	3,111	4,174	4,740	3,942	4,383	4,900	4,267
FCF	(167,223)	15,612	55,663	109,030	108,706	102,603	113,290	113,916	108,454	119,524

Having obtained the discount rate and the estimated free cash flow (FCF), the present value of the SAVF is analysed as follows:

Table VIII - NPV Results using FCFF/WACC Aprroach

<div align="right">*Amounts expressed in Euros*</div>

NPV by FCFF	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Investment	(280,000)										
Free Cash Flows		(167,223)	15,612	55,663	109,030	108,706	102,603	113,290	113,916	108,454	119,524
Free Cash Flows up-to-date	359,010	(154,848)	13,387	44,197	80,164	74,011	64,686	66,138	61,582	54,290	55,404
NPV by FCFF/WACC	79,010										

Summing the discounted cash flows and subtracting the initial investment, we obtain a NPV of 79,010 euros. As the NPV is positive, the investment project shall be accepted.

6.3.2. Valuation using APV model

To make the valuation according to this model, we have to add the unlevered value (using the FCF mentioned above but discounting with the pre-tax WACC rate) with the interest tax shield and subtracting the initial investment. Thus, we obtained the Net Present Value of 79,010 euros, detailed as follows:

Table IX - NPV Results using APV aprroach

<div align="right">*Amounts expressed in Euros*</div>

NPV by APV	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Investment	(280,000)										
Free Cash Flows		(167,223)	15,612	55,663	109,030	108,706	102,603	113,290	113,916	108,454	119,524
Levered Value		554,926	583,663	574,647	511,543	443,719	376,578	293,384	202,915	110,679	-
Debt capacity		64,277	67,606	66,561	59,252	51,396	43,619	33,983	23,504	12,820	-
Interest expenses (Rd = 7,542%)		3,136	4,848	5,099	5,020	4,469	3,876	3,290	2,563	1,773	967
Interest tax shield (ITS)		704	1,089	1,144	1,127	1,002	869	737	575	397	218
PV ITS (pre-tax wacc)	5,550										
Unlevered Value (pre-tax wacc)	353,460										
NPV by Adjusted Present Value	79,010										

As the NPV is positive, the investment project shall be accepted.

6.3.3. Valuation using FCFE model

To make the assessment using the FCFE model, it was necessary to calculate in addition the after tax interest expense and the net borrowing (difference between debt capacity in year n and n-1, since FCF were already previously identified. The flows to equity correspond to free cash flows subtracted from after tax interest expense and added from net borrowing. Actualizing the flows to equity using the cost of debt (R_e), we reach a NPV of 79,010 euros, detailed as follows:

Table X - NPV Results using FCFE Aprroach

<div align="right">*Amounts expressed in Euros*</div>

NPV by FCFE	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Investment	(280,000)										
Free Cash Flows		(167,223)	15,612	55,663	109,030	108,706	102,603	113,290	113,916	108,454	119,524
Levered Value		554,926	583,663	574,647	511,543	443,719	376,578	293,384	202,915	110,679	-
Debt capacity		64,277	67,606	66,561	59,252	51,396	43,619	33,983	23,504	12,820	-
Interest expenses (Rd = 7,542%)		3,136	4,848	5,099	5,020	4,469	3,876	3,290	2,563	1,773	967
After tax interest expense		2,431	3,758	3,953	3,892	3,465	3,006	2,550	1,988	1,374	749
Net borrowing	41,584	22,693	3,329	(1,044)	(7,309)	(7,856)	(7,777)	(9,636)	(10,479)	(10,684)	(12,820)
FCFE	(238,416)	(146,962)	15,183	50,666	97,829	97,386	91,820	101,104	101,449	96,396	105,955
NPV by Flow-to-Equity	79,010										

Once more, as the NPV is positive, the investment project shall be accepted.

6.3.4. IRR and Payback period calculation

The IRR is 11.11% and the payback period is 6 years and 6 months (the number of months is obtained by dividing the last negative Accumulated FCF with the FCF of the following year). Since the IRR is higher than the discount rate (7.992%) and the payback period is less than 10 years of the project, this investment project shall be accepted.

Table XI - IRR and Payback period results

Amounts expressed in Euros

Description	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Free Cash flows	(280,000)	(167,223)	15,612	55,663	109,030	108,706	102,603	113,290	113,916	108,454	119,524
Acumulated FCF	(280,000)	(447,223)	(431,611)	(375,948)	(266,919)	(158,212)	(55,609)	57,681	171,597	280,051	399,575
IRR	11.11%										
Payback Period	6 years and 6 moths										

As it was already noted, the Net Present Value levered is 79,010 euros. Taking into account Table IX, it is possible to calculate the Net Present Value unlevered, given by the difference between the unlevered value of free cash flows and the initial investment. Thus, we have the NPV unlevered to be 73,460 euros, which makes the cost of debt (R_d) lower than the cost of equity (R_e), meaning that, if possible, it would be preferable to use more external debt.

6.4. Investment risk

In this section we intend to analyse the sensitivity of the investment project to variations in wine prices and in the production capacity of SAVF's vineyards. We will do a univariate analysis, meaning that we will only change one of the variables mentioned above, keeping all the other assumptions constant. In this way, we can give the investor another perspective and understand if these variations change the investment decision.

When the sales price of the wine varies by 5% for both PDO and PGI certified wines, the NPV varies as follows:

Table XII - Sensative analysis for the variation on sales price of wine

Scenario	Pessimistic					Expected	Optimistic				
Sensibility	-5%	-4%	-3%	-2%	-1%	0%	1%	2%	3%	4%	5%
PDO wine bulk price (u.p.)	0.90	0.91	0.92	0.93	0.94	**0.95**	0.96	0.97	0.98	0.99	1.00
PGI wine bulk price (u.p.)	0.57	0.58	0.58	0.59	0.59	**0.60**	0.61	0.61	0.62	0.62	0.63
NPV (in euros)	(17,081)	1,504	20,474	39,019	58,674	79,010	97,785	117,837	138,487	157,346	178,920
Δ NPV	-122%	-98%	-74%	-51%	-26%	0%	24%	49%	75%	99%	126%

Looking at Table XII, it can be seen that a 5% variation in the sale price of the wine causes a significant variation in the NPV of the investment project. Actually, a reduction of 5% in this variable causes NPV to become negative, which would lead to altering the investment decision to reject the project. However, it should be noted that the investment decision should not change to a price range up to 4%, despite the NPV reduces practically to zero.

When the vineyard production capacity varies by 5%, the NPV varies as follows:

Table XIII - Scenario analysis for the variation on grape prodution

Scenarios	Pessimistic	Expected	Optimistic
Grape production (kg)	410,400	**432,000**	453,600
NPV	8,901	79,010	143,094
Δ NPV	-89%	-	81%

Table XIII shows that a 5% variation in grape production capacity, makes the Net Present Value of the project also to vary significantly but with less impact than the previous variable because the project considers that the company will always produce the 8.000 kg of the highest quality grape (with the highest price), so the impact of the variation of this variable is mainly on the production of PGI quality wine (with the lowest price). Even so, in the most pessimistic case, the investment decision should be to accept the project.

7. Conclusion

The increasing knowledge and demand of consumers and the growing evolution of exports, have forced the wine sector to transform itself. This transformation is reflected not only in the modernization of planting and winemaking techniques, but also in the transformation of business models of the producing societies. In this context, the need arose to rethink the future of the Sociedade Agrícola de Vale de Fornos in order to adapt it to its economic context, looking for the critical success factors that allow it to generate wealth.

Therefore, the present work sought to analyse the external and internal environment of SAVF using the Porter and SWOT models to define the best strategy for the company to thrive. It was concluded that this scenario should occur with the change of the business model, moving the core business from wine production, bottling, marketing and distribution in Portugal to the production of only red and white bulk wine that shall then be sold to larger size market players that have capacity to export the product to foreign markets. This happens mainly because the company will have a large capacity for producing high quality wine (through the new 34 hectares of planted vineyard) but at the same time, low economic capacity to make a strong marketing investment to increase the reputation of a private label wine.

Subsequently, a viability study of an investment project based on the above scenario was carried out using the DCF, calculated using three different models: FCFF, APV and FCFE, as the evaluation method.

After estimating all future cash flows and taking into account an initial investment of 280,000 euros, it is observed that the project has a NPV of 79,010 euros at the end of a 10-year period, obtaining the same result in both models. This shows that by maintaining a constant debt to equity ratio over time, the models give the same result. As the NPV is positive, it is concluded that SAVF should implement this project as it is in line with the scenario outlined and generates future economic benefits, with an economic from 6 years and 6 months of the project.

Considering the various assumptions made (some more conservative, other more optimistic) we considered it was very important to use other tools to support decision making, namely the study of the sensitivity of the project to variations in the sale price of wine and/or variations in production capacity. According to the data obtained, a 5% change in price variable should change the investment decision since, in the worst case scenario, the NPV would become negative. However, this study shows that the decision to accept the project does not change against the risk of losing 5% of wine production. The variation of costs was not analysed because they do not vary significantly.

As a result of the work done, it is also verified that, in theoretical terms, it would be preferable for the project to be financed with greater use of external debt, but, in practice, this would be difficult to accomplish due to past situations in the company history and the greater demands imposed by national banking.

8. Appendices

Appendix 1 – Evolution of wine yield by grape variety

Grape variety	2019				2020			
	Area of planted vineyards (ha)	Area of productive vineyard (ha)	Grape production (Kg)	Wine Production (Lt)	Area of planted vineyards (ha)	Area of productive vineyard (ha)	Grape production (Kg)	Wine Production (Lt)
Cabernet Sauvignon	5.4586	1.0317	12,380	9,285	5.4586	1.0317	12,380	9,285
Syrah	8.7970	4.6400	55,680	41,760	8.7970	4.6400	55,680	41,760
Aragonês	4.5457	1.1914	14,297	10,723	4.5457	1.1914	14,297	10,723
Castelão	7.4962	0.9316	11,179	8,384	7.4962	0.9316	11,179	8,384
Trincadeira	2.8726	0.0000	0	0	2.8726	0.0000	0	0
Touriga Nacional	9.0231	3.9388	47,266	35,449	9.0231	3.9388	47,266	35,449
Touriga Franca	2.2000	0.7227	8,672	6,504	2.2000	0.7227	8,672	6,504
Subtotal red wine grape	**40.3932**	**12.4562**	**149,474**	**112,106**	**40.3932**	**12.4562**	**149,474**	**112,106**
Arinto	0.7081	0.7081	8,497	6,373	0.7081	0.7081	8,497	6,373
Chadonnay	0.9315	0.0000	0	0	0.9315	0.0000	0	0
Fernão Pires	3.0641	0.0000	0	0	3.0641	0.0000	0	0
Gewurztraminer	0.5785	0.0000	0	0	0.5785	0.0000	0	0
Sauvignon Blanc	1.4889	0.0000	0	0	1.4889	0.0000	0	0
Verdelho	0.8357	0.8357	10,028	7,521	0.8357	0.8357	10,028	7,521
Subtotal white wine grape	**7.6068**	**1.5438**	**18,526**	**13,894**	**7.6068**	**1.5438**	**18,526**	**13,894**
Total grape	**48.0000**	**14.0000**	**168,000**	**126,000**	**48.0000**	**14.0000**	**168,000**	**126,000**

Grape variety	2021				2022 and following			
	Area of planted vineyards (ha)	Area of productive vineyard (ha)	Grape production (Kg)	Wine Production (Lt)	Area of planted vineyards (ha)	Area of productive vineyard (ha)	Grape production (Kg)	Wine Production (Lt)
Cabernet Sauvignon	5.4586	2.0052	24,062	18,047	5.4586	5.4586	65,503	49,127
Syrah	8.7970	6.7970	81,564	61,173	8.7970	8.7970	105,564	79,173
Aragonês	4.5457	1.1914	14,297	10,723	4.5457	4.5457	54,548	40,911
Castelão	7.4962	4.3588	52,306	39,229	7.4962	7.4962	89,954	67,466
Trincadeira	2.8726	2.1894	26,273	19,705	2.8726	2.8726	34,471	25,853
Touriga Nacional	9.0231	6.1117	73,340	55,005	9.0231	9.0231	108,277	81,208
Touriga Franca	2.2000	1.7227	20,672	15,504	2.2000	2.2000	26,400	19,800
Subtotal red wine grape	**40.3932**	**24.3762**	**292,514**	**219,386**	**40.3932**	**40.3932**	**484,718**	**363,539**
Arinto	0.7081	0.7081	8,497	6,373	0.7081	0.7081	8,497	6,373
Chadonnay	0.9315	0.9315	11,178	8,384	0.9315	0.9315	11,178	8,384
Fernão Pires	3.0641	3.0641	36,769	27,577	3.0641	3.0641	36,769	27,577
Gewurztraminer	0.5785	0.5785	6,942	5,207	0.5785	0.5785	6,942	5,207
Sauvignon Blanc	1.4889	0.5059	6,071	4,553	1.4889	1.4889	17,867	13,400
Verdelho	0.8357	0.8357	10,028	7,521	0.8357	0.8357	10,028	7,521
Subtotal white wine grape	**7.6068**	**6.6238**	**79,486**	**59,614**	**7.6068**	**7.6068**	**91,282**	**68,461**
Total grape	**48.0000**	**31.0000**	**372,000**	**279,000**	**48.0000**	**48.0000**	**576,000**	**432,000**

Source: Prepared by author using information provided by SAVF's Agronomist

Appendix 2 – Income Statement for the years end as of 2016-2018

Amounts expressed in Euros

	2016	2017	2018
Revenue	124,290	158,637	165,284
Operational Government Grants	150,000	150,000	150,000
Variation in production inventories	125,248	81,610	33,198
Cost of sales	(125,996)	(120,804)	(101,252)
Supplies and services	(89,452)	(53,510)	(57,984)
Personnel costs	(112,132)	(110,306)	(112,239)
Other income	31,987	17,081	2,428
Other expenses	(16,268)	(24,547)	(4,624)
EBITDA	**87,677**	**98,161**	**74,811**
Depreciations and amortizations	(35,593)	(34,508)	(16,099)
Provisions and impairment	-	-	-
EBIT	**52,084**	**63,653**	**58,712**
Financial expenses	(3,621)	(6,959)	(18,101)
EBT	**48,463**	**56,694**	**40,611**
Income tax expense	(3,570)	(4,212)	(8,438)
Net profit/(loss) for the period	**44,893**	**52,482**	**32,174**

Source: Prepared by author based on SAVF Annual Reports

Appendix 3 – Statement of Financial Position for the years end as of 2016-2018

Amounts expressed in Euros

	2016	2017	2018
Assets			
Non-current assets			
Property, plant and equipment	145,326	122,613	106,496
Intangible assets	81,123	77,895	74,666
Biological assets	1,110,000	1,110,000	1,110,000
Other assets	123	433	694
	1,336,572	**1,310,941**	**1,291,856**
Current assets			
Inventories	57,349	124,711	156,716
Trade receivables	103,100	77,630	31,400
Current tax assets	36,422	18,946	4,350
Other debtors and other assets	39,612	14,877	6,899
Deferrals	5,148	1,306	2,380
Cash and cash equivalents	5,074	13,032	5,224
	246,705	**250,502**	**206,969**
Total assets	**1,583,277**	**1,561,443**	**1,498,825**
Equity and Liabilities			
Equity			
Share capital	879,500	879,500	879,500
Legal Reserve	4,941	6,708	8,599
Retained earnings	(141,207)	(105,868)	(64,388)
Net profit/(loss) for the period	44,893	52,482	32,174
Total equity	**788,127**	**832,822**	**855,885**
Libiabilities			
Non-current liabilities			
Financial debt	51,732	96,232	223,961
	51,732	**96,232**	**223,961**
Current liabilities			
Trade payables	55,454	109,861	27,427
Current tax liabilities	50,169	32,435	28,908
Financial debt	-	-	16,039
Other liabilities	36,272	36,832	46,605
Deferrals	601,523	453,261	300,000
	743,418	**632,389**	**418,979**
Total liabilities	**795,150**	**728,621**	**642,940**
Total equity and liabilities	**1,583,277**	**1,561,443**	**1,498,825**

Source: Prepared by author based on SAVF Annual Reports

Appendix 4 – Ratios formulas

[1] *Debt Ratio* $= \dfrac{\textit{Total liabilities}}{\textit{Total Assets}}$

[2] *Financial Debt in % of Liabilities* $= \dfrac{\textit{Financial Debt (C+NC)}}{\textit{Total Liabilities}}$

[3] *Debit to Equity Ratio* $= \dfrac{\textit{Total Liabilities}}{\textit{Total Equity}}$

[4] *Financial Autonomy* $= \dfrac{\textit{Total Equity}}{\textit{Total Assets}}$

[5] *EBITDA margin on Revenue* $= \dfrac{\textit{EBITDA}}{\textit{Revenue}}$

[6] *EBIT margin on Revenue* $= \dfrac{\textit{EBIT}}{\textit{Revenue}}$

[7] *Return of turnover* $= \dfrac{\textit{Net profit/(loss)}}{\textit{Turnover}}$

[8] *ROE (Return on Equity)* $= \dfrac{\textit{Net profit/(loss)}}{\textit{Total Equity}}$

[9] *ROI (Return of Investment)* $= \dfrac{\textit{EBT}}{\textit{(Total Equity + Total Liabilities)}}$

[10] *Asset turnover* $= \dfrac{\textit{Turnover}}{\textit{Total Assets}}$

Appendix 5 – Free Cash Flows forecasting output

Amounts expressed in Euros	Base year 2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	165,284	413,839	283,225	435,988	447,844	457,003	470,136	478,845	487,564	500,612	509,350
Wine Sale (Bottled)	150,284	282,089	0	0	0	0	0	0	0	0	0
Wine sale (bulked)	0	116,600	264,645	417,055	425,291	433,931	446,487	454,723	462,959	475,515	483,751
Liters of PDO red wine	0	99,650	195,010	323,146	323,146	323,146	323,146	323,146	323,146	323,146	323,146
Liters of PGI red wine	0	12,456	24,376	40,393	40,393	40,393	40,393	40,393	40,393	40,393	40,393
Liters of PDO white wine	0	13,894	59,614	68,461	68,461	68,461	68,461	68,461	68,461	68,461	68,461
Liters of PGI white wine	0	0	0	0	0	0	0	0	0	0	0
PDO red wine bulk price	0.95	0.96	0.98	1.00	1.02	1.04	1.07	1.09	1.11	1.14	1.16
PGI red wine bulk price	0.60	0.61	0.62	0.63	0.64	0.66	0.68	0.69	0.70	0.72	0.73
PDO white wine bulk price	0.95	0.96	0.98	1.00	1.02	1.04	1.07	1.09	1.11	1.14	1.16
PGI white wine bulk price	0.60	0.61	0.62	0.63	0.64	0.66	0.68	0.69	0.70	0.72	0.73
Social events	15,000	15,150	18,581	18,934	22,553	23,072	23,649	24,122	24,605	25,097	25,599
Number of social events	5	5	6	6	7	7	7	7	7	7	7
Unitary price	3,000	3,030	3,097	3,156	3,222	3,296	3,378	3,446	3,515	3,585	3,657
Cost of sales	101,252	199,643	99,166	146,425	140,372	143,601	158,455	150,138	153,140	168,154	159,327
Cost of bottled wine	43,234	141,044	0	0	0	0	0	0	0	0	
Vineyard maintenance	24,509	24,754	36,959	60,961	51,502	52,687	65,267	55,085	56,187	69,262	58,457
External labor costs	8,075	8,156	8,335	8,494	8,672	8,872	9,094	9,276	9,461	9,650	9,843
Untangle	2,125	2,146	2,194	2,235	2,282	2,335	2,393	2,441	2,490	2,540	2,590
Prune	3,950	3,990	4,077	4,155	4,242	4,340	4,448	4,537	4,628	4,721	4,815
Retank	2,000	2,020	2,065	2,104	2,148	2,197	2,252	2,297	2,343	2,390	2,438
Consumables	8,954	9,044	20,026	42,812	32,972	33,730	45,836	35,266	35,971	48,641	37,424
Phytopharmaceuticals products	8,954	9,044	20,026	32,293	32,972	33,730	34,574	35,266	35,971	36,690	37,424
Fertilizers	0	0	0	10,519	0	0	11,262	0	0	11,951	0
Own machines	6,779	6,847	6,998	7,131	7,281	7,448	7,635	7,787	7,943	8,102	8,264
Cost of rent Pruning machines	700	707	1,600	2,524	2,578	2,637	2,703	2,757	2,812	2,868	2,926
Vintage	6,162	6,223	17,560	24,153	24,660	25,228	25,859	26,376	26,903	27,441	27,990
External labor costs	3,902	3,941	4,028	4,104	4,191	4,287	4,394	4,482	4,572	4,663	4,756
Own machines	2,260	2,282	2,333	2,377	2,427	2,483	2,545	2,596	2,648	2,701	2,755
Cost of rent vintage machines	0	0	11,200	17,671	18,043	18,458	18,920	19,298	19,684	20,078	20,479
Annual maintenance of the winery	6,648	6,714	15,016	23,976	24,479	25,042	25,669	26,182	26,706	27,240	27,785
Winemaking	13,200	13,332	20,340	27,868	28,453	29,108	29,836	30,433	31,042	31,662	32,296
Oenological products	5,474	5,529	12,364	19,741	20,155	20,619	21,135	21,558	21,989	22,429	22,877
Laboratory analysis	7,727	7,804	7,976	8,127	8,298	8,489	8,701	8,875	9,053	9,234	9,419
Social events	7,500	7,575	9,290	9,467	11,277	11,536	11,825	12,061	12,302	12,548	12,799
Personnal expenses	112,239	113,361	98,722	124,646	127,264	130,192	133,449	136,118	138,841	141,617	144,450
Supplies and services	57,984	47,874	46,106	46,933	47,865	48,907	50,066	51,016	51,985	52,973	53,982
Electicity	6,710	6,777	6,927	7,058	7,207	7,372	7,557	7,708	7,862	8,019	8,180
Communication	3,723	3,760	3,843	3,916	3,998	4,090	4,193	4,277	4,362	4,449	4,538
Fuel and other fluids	5,823	5,881	6,011	6,125	6,254	6,398	6,558	6,689	6,822	6,959	7,098
Pest control	3,306	3,339	3,412	3,477	3,550	3,632	3,723	3,797	3,873	3,950	4,029
Materials	520	525	537	547	558	571	586	597	609	621	634
Marketing	15,808	5,277	2,570	2,570	2,570	2,570	2,570	2,570	2,570	2,570	2,570
Surveillance and Security	3,301	3,334	3,407	3,472	3,545	3,627	3,717	3,792	3,868	3,945	4,024
Vineyard and harvest insurance	11,040	11,150	11,396	11,613	11,857	12,129	12,433	12,681	12,935	13,194	13,458
Other costs	7,754	7,830	8,003	8,155	8,326	8,518	8,731	8,905	9,083	9,265	9,450
Other costs	4,624	4,670	4,773	4,864	4,966	5,080	5,207	5,312	5,418	5,526	5,637
Other income	2,428	2,452	2,506	2,554	2,608	2,668	2,734	2,789	2,845	2,902	2,960

Appendix 6 – Income Statement forecasting output

Amounts expressed in Euros

	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E
Revenue	413,839	283,225	435,988	447,844	457,003	470,136	478,845	487,564	500,612	509,350
Operational Government Grants	150,000	150,000	-	-	-	-	-	-	-	-
Cost of sales	(199,643)	(99,166)	(146,425)	(140,372)	(143,601)	(158,455)	(150,138)	(153,140)	(168,154)	(159,327)
Supplies and services	(47,874)	(46,106)	(46,933)	(47,865)	(48,907)	(50,066)	(51,016)	(51,985)	(52,973)	(53,982)
Personnel costs	(113,361)	(98,722)	(124,646)	(127,264)	(130,192)	(133,449)	(136,118)	(138,841)	(141,617)	(144,450)
Other income	2,452	2,506	2,554	2,608	2,668	2,734	2,789	2,845	2,902	2,960
Other expenses	(4,670)	(4,773)	(4,864)	(4,966)	(5,080)	(5,207)	(5,312)	(5,418)	(5,526)	(5,637)
EBITDA	**200,742**	**186,964**	**115,675**	**129,985**	**131,889**	**125,692**	**139,051**	**141,025**	**135,243**	**148,915**
Depreciations and amortizations	(33,182)	(33,182)	(33,182)	(33,182)	(33,182)	(33,182)	(33,182)	(33,182)	(33,182)	(33,182)
Provisions and impairment	(15,672)	-	-	-	-	-	-	-	-	-
EBIT	**151,888**	**153,782**	**82,493**	**96,803**	**98,707**	**92,510**	**105,869**	**107,843**	**102,061**	**115,733**
Financial expenses	(23,930)	(23,115)	(19,846)	(14,827)	(11,559)	(8,290)	(6,230)	(4,171)	(2,112)	(1,408)
EBT	**127,958**	**130,667**	**62,647**	**81,975**	**87,149**	**84,221**	**99,638**	**103,672**	**99,949**	**114,325**
Income tax expense	(31,717)	(28,800)	(13,495)	(17,844)	(19,008)	(18,350)	(21,819)	(22,726)	(21,889)	(25,123)
Net profit/(loss) for the period	**96,241**	**101,867**	**49,151**	**64,131**	**68,140**	**65,871**	**77,820**	**80,946**	**78,060**	**89,202**

Appendix 7 – Statement of Financial Position forecasting output

Amounts expressed in Euros

	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E
Assets										
Non-current assets										
Property, plant and equipment	360,781	335,065	309,350	283,635	257,919	232,204	206,489	180,773	155,058	129,343
Intangible assets	67,199	59,733	52,266	44,800	37,333	29,866	22,400	14,933	7,467	-
Biological assets	1,110,000	1,110,000	1,110,000	1,110,000	1,110,000	1,110,000	1,110,000	1,110,000	1,110,000	1,110,000
Other assets	1,564	2,321	3,272	4,244	5,237	6,256	7,295	8,354	9,435	10,538
	1,539,544	1,507,119	1,474,889	1,442,678	1,410,490	1,378,326	1,346,183	1,314,061	1,281,960	1,249,880
Current assets										
Inventories	9,717	22,054	34,755	35,441	36,161	37,207	37,894	38,580	39,626	40,313
Trade receivables	76,872	52,610	80,986	83,189	84,890	87,329	88,947	90,567	92,990	94,613
Current tax assets	-	-	-	-	-	-	-	-	-	-
Other debtors and other assets	6,209	5,519	4,829	4,139	3,450	2,760	2,070	1,380	690	0
Deferrals	2,380	2,380	2,380	2,380	2,380	2,380	2,380	2,380	2,380	2,380
Cash and cash	77,162	34,891	26,413	76,301	129,113	179,065	257,781	339,162	417,119	524,799
	172,339	117,454	149,363	201,450	255,993	308,741	389,071	472,068	552,805	662,105
Total assets	1,711,883	1,624,573	1,624,252	1,644,128	1,666,483	1,687,067	1,735,255	1,786,129	1,834,765	1,911,986
Equity and Liabilities										
Equity										
Share capital	1,066,167	1,066,167	1,066,167	1,066,167	1,066,167	1,066,167	1,066,167	1,066,167	1,066,167	1,066,167
Legal Reserve	10,208	15,020	20,113	22,571	25,777	29,184	32,478	36,369	40,416	44,319
Retained earnings	(33,823)	57,606	154,380	201,073	261,998	326,731	389,308	463,237	540,135	614,293
Net profit/(loss) for the period	96,241	101,867	49,151	64,131	68,140	65,871	77,820	80,946	78,060	89,202
Total equity	1,138,793	1,240,659	1,289,810	1,353,941	1,422,082	1,487,953	1,565,772	1,646,718	1,724,778	1,813,980
Libiabilities										
Non-current liabilities										
Financial debt	283,285	239,942	196,599	153,256	109,913	82,609	55,304	28,000	18,667	9,333
	283,285	239,942	196,599	153,256	109,913	82,609	55,304	28,000	18,667	9,333
Current liabilities										
Trade payables	21,528	29,373	39,095	38,060	38,924	42,161	40,672	41,475	44,710	43,129
Current tax liabilities	42,323	33,973	22,781	27,565	28,919	28,398	32,221	33,311	32,616	36,210
Financial debt	34,010	43,343	43,343	43,343	43,343	27,304	27,304	27,304	9,333	9,333
Other liabilities	41,945	37,284	32,624	27,963	23,303	18,642	13,982	9,321	4,661	-
Deferrals	150,000	-	-	-	-	-	-	-	-	-
	289,805	143,973	137,843	136,931	134,488	116,506	114,178	111,411	91,320	88,672
Total liabilities	573,090	383,914	334,442	290,187	244,401	199,114	169,483	139,411	109,987	98,006
Total equity and liabilities	1,711,883	1,624,573	1,624,252	1,644,128	1,666,483	1,687,067	1,735,255	1,786,129	1,834,765	1,911,986

Appendix 8 – Functional Balance Sheet forecasting output

Amounts expressed in Euros

	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E
Working capital	(117,466)	(26,518)	11,520	64,519	121,505	192,235	274,893	360,657	461,485	573,433
Non-current assets	1,539,544	1,507,119	1,474,889	1,442,678	1,410,490	1,378,326	1,346,183	1,314,061	1,281,960	1,249,880
Non-current liabilities	283,285	239,942	196,599	153,256	109,913	82,609	55,304	28,000	18,667	9,333
Equity	1,138,793	1,240,659	1,289,810	1,353,941	1,422,082	1,487,953	1,565,772	1,646,718	1,724,778	1,813,980
Working capital requirements	(160,618)	(18,067)	28,450	31,561	35,735	40,475	44,417	48,799	53,700	57,967
Remaning assets	95,178	82,563	122,950	125,149	126,880	129,676	131,290	132,906	135,686	137,306
Remaning liabilities	255,796	100,630	94,500	93,588	91,145	89,201	86,874	84,107	81,987	79,339
Net Treasury	43,152	(8,452)	(16,930)	32,958	85,770	151,761	230,477	311,858	407,785	515,466
Cash and cash equivalents	77,162	34,891	26,413	76,301	129,113	179,065	257,781	339,162	417,119	524,799
Current Financial Debt	34,010	43,343	43,343	43,343	43,343	27,304	27,304	27,304	9,333	9,333

9. References

Almeida, M. (2016). O Vinho na Ponta da Língua, 1st Ed. Porto Salvo: Saída de Emergência.

Brealey, R. and Meyers, S. (2003). Principles of Corporate Finance, 7th Ed. London: Mc-Graw-Hill.

Cardoso, M. (2016). Em Nome do Vinho. Exame, 6-2016, p.19-40.

Damodaran, A. (2005). Valuation Approaches and Metrics: A Survey of the Theory and Evidence, Fundations and Trends in Finance, Vol 1, No 8. Hanover: Publisheres Inc.

Damodaran, A. (2019) – Betas by sector – Beverage (Alcoholic)'s Levered Beta – Available in: http://people.stern.nyu.edu/adamodar/New_Home_Page/datafile/Betas.html   [Access in: 30.04.2019]

Fernandez, P. (2007). Company valuation methods – The most commun errors in valuations, IESE Working Papper No 449, University of Navarra, p1-27.

Instituto da Vinha e do Vinho (2019a). Evolução da produção total por Região vitivinícola, 2019. Available in: https://www.ivv.gov.pt/np4/36/

Instituto da Vinha e do Vinho (2019b). Síntese estatística – Exportação/Expedição de Vinho - Dezembro de 2018, Fevereiro 2019. Available in: https://www.ivv.gov.pt/np4/37/

Instituto da Vinha e do Vinho (2019c). Evolução da Área Total de Vinha Portugal, Série de 1989 a 2018, Março 2019. Available in: https://www.ivv.gov.pt/np4/35/

International Monetary Found (2019) - Datasets World Economic Outlook – Portugal, April 2019. Available   in: https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/OEMDC/ADVEC/WEOWORLD [Access in: 10.05.2019]

Investing.com (2019) – Portugal 10 years bonds - Available in: https://pt.investing.com/rates-bonds/portugal-10-year-bond-yield-historical-data [Access in: 30.04.2019]

Karlsson, P. (2017) - The world's 10 biggest wine producers – Euromonitor International 2016. Available in: https://www.bkwine.com/news/worlds-10-biggest-wine-producers/ [Acess in: 2018/10/20]

Koller, T., Goedhart, M., Wessels, D., McKinsey&Company (2015). Valuation: Measuring and Managing the Value of Companies, 6th Ed. New Jersey: Jonh Wiley & Sons

Linter, J. (1965). Review of Economics and Statistics - The valuation of risk assets and the selection of risk investments in stock portfolios and capital budgets. Vol. 47, No.1, Cambridge: MIT Press

Lourenço, M. (2017). Caraterização do setor do vinho em Portugal. Banco de Portugal – Núcleo de   Análise   Sectorial,   Março   de   2017.   Available   in: https://www.bportugal.pt/sites/default/files/caraterizacao_do_setor_do_vinho_em_portugal_final.pdf [Access in: 06.02.2019]

Modigliani, F. and Miller, M. (1958). The Cost of Capital, Corporation Finance and the Theory of Investment, Vol 48: American Economic Review.

Modigliani, F. and Miller, M. (1963). Corporate Income Taxes and the Cost of Capital: A Correction, Vol 53, No 3: American Economic Review.

Mota, A., Nunes, J., Inácio, P., Barroso, C., Ferreira, M. e Oliveira, L. (2015). Finanças da Empresa, 5th Ed., Lisboa: Edições Sílabo.

Neves, J. (2002). Avaliação de Empresas e Negócios, 1st Ed. Lisboa: McGraw-Hill.

Neves, J. (2005). Avaliação e Gestão da Performance Estratégica da Empresa, 1st Ed. Lisboa: Texto Editores.

Neves, J. (2012). Análise e Relato Financeiro, 5th Ed. Alfragide: Texto Editores.

Pearce, A. and Robinson, R. (1991). Formulation, Implementation and Control of Competitive Strategy, 4th Ed. Boston: Irwin

Porter, M. (1980). Competitive Strategy: Techniques for Analyzing Industries and Competitors, 1st Ed. New York: Free Press.

Porter, M. (1985). Competitive Advantage: Creating and Sustaining a Superior Performance, 1st Ed. New York: Free Press.

PWC Portugal (2019). Guia Fiscal 2019 – IRC. Available in: https://www.pwc.pt/pt/pwcinforfisco/guia-fiscal/2019/irc.html [Access in: 30.04.2019]

Santos, A. (2008). Gestão Estratégica – Conceitos, modelos e instrumentos, 1st Ed. Lisboa: Escolar Editora.

Sharpe, W. (1964). The Journal of Finance - Capital asset prices: a theory of market equilibrium under conditions of risk. Vol 19, No.3, New York: Blackwell Publishing

Soares, I., Moreira, J., Pinho, C. and Couto, J. (2008). Decisões de Investimento – Análise Financeira de Projectos, 2nd Ed. Lisboa: Edições Sílabo.

Suozzo, P., Copper, S., Sutherlan, G. and Deng, Z. (2001). Research report – Valuation Multiples: A Primer, UBS Investment Bank. Available in: http://pages.stern.nyu.edu/~ekerschn/pdfs/readingsemk/EMK%20NYU%20S07%20Global%20 Tech%20Strategy%20Valuation%20Multiples%20Primer.pdf [Access in: 02.08.2019]

The International Organization of Vine and Wine (2019a). State of the Vitiviniculture World Market - State of the sector in 2018, April 2019. Available in: http://www.oiv.int/public/medias/6679/en-oiv-state-of-the-vitiviniculture-world-market-2019.pdf

The International Organization of Vine and Wine (2019b). Statistical Report on World Vitiviniculture in 2018, April 2019. Available in: http://www.oiv.int/public/medias/6782/oiv-2019-statistical-report-on-world-vitiviniculture.pdf

World Ranking of Wines & Spirits (2017) - Top 100 Wine Companies more Awarded of the World 2017. Available in: http://www.wawwj.com/2017/_EN/ran_soc.php [2018/10/15]

10. Abbreviations

APV – Adjusted Present Value

CAPM – Capital Asset Pricing Model

CDP – Controlled Designation of Origin

CVRT – Tejo Regional Wine Commission

DCF – Discounted Cash Flow

EBIT – Earnings Before Interest and Taxes

EBITDA – Earnings Before Interest, Taxes, Depreciation and Amortization

EBT - Earnings Before Taxes

EPS – Earnings Per Share

EV – Enterprise Value

FCF – Free Cash Flow

FCFE – Free Cash Flow to Equity

FCFF – Free Cash Flow to the Firm

Ha – Hectares

Hl - Hectoliters

IMF – International Monetary Found

IRC – Corporate income tax

IRR – Internal Rate of Return

ITS – Interest tax shield

IVV – Portugal's Instituto da Vinha e do Vinho

NPV – Net Present Value

OIV – International Organization of Vine and Wine

PBV – Price Book Value

PDO – Protected Designation of Origin

PER – Price-Earnings Ratio

PGI – Protected Geographical Indication

Quinta – Quinta de Vale de Fornos

R_d – Cost of debt

R_e – Cost of equity

R_f – Risk-free interest rate

SAVF – Sociedade Agrícola de Vale de Fornos

SMES – Small and medium-size enterprises

SWOT – Strengths, Weakenesses, Opportunities and Treaths

WACC – Weighted Average Cost of Capital

β - Beta