ECONOMIC PERFORMANCE IN VITICULTURE: EVIDENCE FROM ROMANIA

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Abstract: *Romania has determinant factors (climate, soil quality, local conditions) favouring quality wines, which gives it an important wine potential. The objective of this paper is to study the effects of the management of the production factors on the performance of the Romanian wine sector. The results of the study show that labor productivity and efficient management of technical capital elements have positively influenced the economic performance of Romanian vineyards, but the financing modality (debts level) has negatively influenced. The policies recommended in the study to increase the economic performance in Romania viticulture refer to an efficient management of the production factors to increase their efficiency, and utilization of an adequate financing.*

Keywords: *vineyards holding, economic performance, production factors, profitability*

JEL Classification: Q12, Q18

Introduction

The Wine sector represents an important agriculture segment in many countries due to its economic, social, and cultural implications. The European Union is a big player on the world's wine market. The EU achieved in 2014-2018 period more than de 65 % of wine global production, 60 % of consumption and 70% of world exports. Concomitantly EU poses 45 % of the wine-growing areas in the world (Eurostat, 2019).

The EU Common Agricultural Policy (CAP), and with it the EU wine policy is characterized in present by a profound reform process based on the increasing of the competitivity and the achievement of some ambitious social and environmental objectives. The sense of changes in wine policy evolved from the quantitative aspects to the quality increasing and improvement of the competitiveness of European wine production in the global market (Pomarici E., Sardone R., 2020). The National Support Programme financed by EU contains structural measures (Promotion; Restructuring and Conversion of vineyards; Investments; Innovation in the wine sector; By-product distillation) and conjunctural measures (Mutual funds; Harvest insurance; Green harvesting).

A general overview (Table 1) shows that in 2015, the total area under vines in the EU was 3.2 million ha, that represents 1,8% of the total utilized agricultural area (UAA). Spain, France and Italy were the main winegrower in 2015, with close to three quarters of the total EU area under vines. They are followed at a great distance by Poland and Romania. The average vineyard area per holding in the EU was 1.3 ha, but we can observe a strong contrast between Romania owning 35.5% of the vineyard holdings with an average area of only 0.2 ha and France (3.2% of vineyards holdings with 10.5 ha average area per holding).

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Table 1.

Main characteristics of vineyards in the EU Member States, 2015

Country	Area		Number of vineyard holdings		Average area per holding (in ha)
	Ha	%	Nr	%	
EU*	**3190459**	**100**	**2404968**	**100**	**1.3**
Spain	941154	29.5	517615	21.5	1.8
France	802896	25.2	76453	3.2	10.5
Italy**	610291	19.1	299191	12.4	2.0
Portugal	198586	6.2	212128	8.8	0.9
Romania	183717	5.8	854766	35.5	0.2
Germany	102581	3.2	43389	1.8	2.4
Greece	103298	3.2	188896	7.9	0.5
Hungary	65049	2.0	35741	1.5	1.8
Others	182887	5.8	176789	7.4	1.0

Source: Eurostat, Structure of vineyards in 2015

Over 3 million hectares of vineyards in the EU… of which almost 80% are for quality wine, News release, 57/2017

The total production of grapes for wine in the EU was an estimated 25.7 million tonnes in 2018. We observe from Figure 1 that Italy, Spain and France are the countries that obtain almost 80% of the production for wine grapes. Romania with its 1.07 million tonnes (4.1%) is rank on the 5-th places in EU, after Germany (5.5%) but overpasses Portugal (3%), Hungary (2%) and Greece (1.8%).

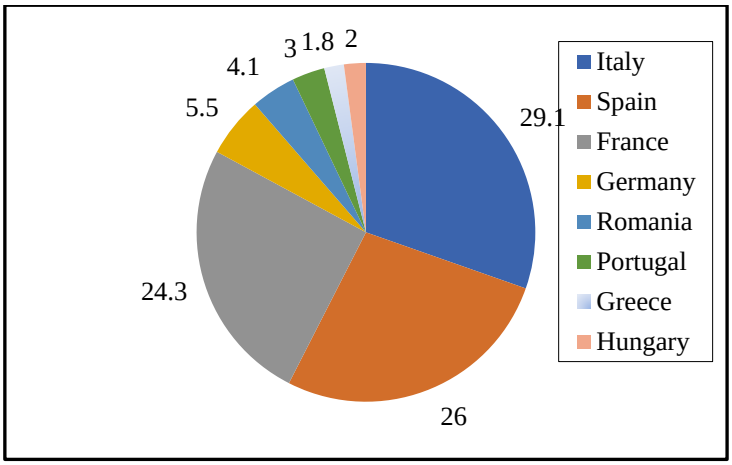

Figure 1. Production of grapes for wine, 2018 (% of EU-28 total harvested production)
Source: Eurostat (online data code: apro_cpnh1)

The viability of the vineyards holdings depends in a great way by the profitability of production. An analysis of the data derived from the Farm Accountancy Data Network (FADN) reveals that farms oriented toward grape and wine production are efficient. The analysis of the economic situation of farms specialized in wine based on the indicators from Table 3 shows that vineyard holdings from all countries are profitable. The rate Total output/Total input has the highest value in the farms of

Spain (188%) and Italy (186%), and in Romania (151%) is close the EU average (154%). Gross farm income and Farm net value added are higher in France and Germany and are correlated with Average area per holding (Table 1) and Depreciation (Table 3), that are also bigger. The specialized studies in the field show that exist a positive and statistically significant relation between firm size and profitability (Sellers, R., Alampi-Sottini, V., 2016). The Work Productivity (FMVA/AWU) is almost three times lower in Romania than the EU-28 average being influenced particularly by the utilized technologies in vineyard and the grade of their capitalization.

Table 3.

Economic situation of farms specialized in wine
(average per farm in thousand of euro)

Country	**Total output**	**Total input**	**TO/ TI %**	**Gross farm income**	**Farm net value added**	**FMVA/ AWU**	**Depre-ciation**
Italy	78.6	41.8	188	58.6	51.7	40.5	7.0
Spain	56	30	186	45.3	41.4	25.2	3.9
France	244.8	176.1	139	154.4	128.1	49.0	26.3
Germany	174.2	121.7	143	117.8	98.5	38.7	19.2
Romania	59.2	39.3	151	42.5	35.4	12.3	7.1
Portugal	58.8	36.4	162	38.5	33.2	18.0	5.3
Greece	16.9	12.0	141.0	13.3	10.7	12.3	2.7
Hungary	55.5	41.5	134	39.8	31.7	16.4	8.2
EU-28	108.6	70.5	154	74.5	63.4	36.1	11.1

Note: TO-total output; TI- Total input; FMVA- Farm net value added; AWU- Annual work unit

Source: FADN, https://agridata.ec.europa.eu/extensions/DashboardFarmEconomyFocusCrops/DashboardFarmEconomyFocusCrops.html

This paper studies the factors which have influenced the performance of viticultural holdings and it has as main objective to identify the relationship between the management of the economic elements of capital and the profitability of viticultural firms completing the existing gap in the literature concerning the Romania situation. Another purpose of the paper is to appreciate the contribution of some factors of economic type for achieving the performance in viticultural holdings.

Literature review

Most approaches to the success of firms consider that the elements involved in getting performance are external market factors, organizational factors, and management variables i.e. those factors expressing the efficiency with which internal production resources are used (Hansen and Birger, 1989).

The topical issues about the elements which may influence the vineyards holdings' yields, results and performance show that efficiency of viticultural activities is influenced by a complex of technical, technological, natural, economic and management factors.

Among technical factors, it is considered that the degree of mechanization stimulates the productivity of vineyards, reduces the dependence on workforce and provides high economic potential (Morris, 2002).

Regarding the relationship with the natural farming, some authors show that the use of pesticides influences the techno-economic performance of vine-growers and it also produces environmental damages. The proposed solution is to extend the environmental innovation, which will lead to improve ecological sustainability (Saint-Ges and Belis-Bergouignan, 2009). Other studies point out that the viticultural production is closely correlate with seasonal climatic conditions (Thompson et al., 2011), availability of water and site characteristics (Serrano et al., 2010). Agronomy performance and also, the economic-financial performance of vineyards may be also influenced by the cropping systems and especially, by the soil-surface management (Ripoche et al, 2011).

Theoretical perspective on economic factors having a key role for firm-level profitability aims the characteristics of the sector to which the company belongs, competitive position, and internal resources. The analysis of performance, primarily oriented to emphasize the contribution of its production factors, leads us to study the impact on human resources (Hansen and Wernerfelt, 1989), (Becker and Huselid, 2006), (Mahsud et al., 2011), the efficiency of physical capital resources (Snedegar, 2009), and innovative adaptability of products and services (Ebben and Johnson, 2005). Number of studies suggests that one of the most important ways of obtaining any competitive advantage by a firm is the production factors management (assets or resources) (Barney, 1991, Hoskisson et al., 1999), (Mintzberg and Quinn, 2002, Ribeiro and Ferreira, 2010). Assuming a resource-based view draws the attention towards the management of different capitals used in the company's activity, tangible or intangible, enabling it to improve its efficiency and effectiveness. The competitive advantage occurs when a firm having specific resource works on a value creating strategy, better than its competitors, based on development and efficiency of resources (Wernfelt, 1984). In the case of some significant holdings of Romania, the agriculture sector identified that lately, the factors generating financial performance differences between firms and the manifestation of risk include investments, management of financing sources, equilibrium in financial flows and modality of resources utilization (Burja and Burja, 2013).

Data and methodology

A prerequisite for economic viability analysis of viticulture is that the viticultural holdings profitability levels are a consequence of the interaction of various agro-technical elements, as well as of economic, social and environmental elements.

To achieve the basic aim of this paper, namely: identifying the underlying factors of vineyard holdings performance in relation with the economic resources' management, a resource-based view was followed and economic indicators were used whose content is significant for the phenomenon of profitability. The data selected for the study were taken from the financial statements of companies dealing mainly with grapes farming (doingbusiness.ro business portal). To obtain a lower variability between companies and relevant outcomes, in the study were included wine farms, having less than 10 employees, and having recorded a profit at least one year during the study. Thus, it was intended to identify the factors that had caused changes in their financial state and the selected companies' overall performance, followed in the real context of their work. The period 2014-2018 is registered and the data panel used here includes 185 firm-year observations for a sample of 37 vineyard holdings.

The relationship between profitability and economic determinant factors was tested using the following functions:

$$ROA = f(FATR, DNCCA, LFP, DTA) \qquad (1)$$

where: ROA is Return on assets; FATR is Fixed assets turnover ratio; DNCCA is Days of Non-Cash Current Assets; LFP is Labor Productivity and DTA is Debts to Total Assets.

The economic viability of vineyard holdings is assessed based on the indicator "Return on assets", measuring the profitability of patrimony, managed by each firm and represents the dependent variable of the analytical model.

The explanatory variables of the model were selected, out of the indicators reflecting aspects of effective management of the companies' capital: fixed capital, working capital, working force and financial capital.

The efficiency of fixed assets is monitored by the indicator "Fixed Assets turnover ratio." It expresses the efficiency of fixed assets i.e., the company's technical and productive ability to generate revenue. If the turnover growth outruns the growth of fixed assets, there is an increase in the productive capacity of fixed capital and, an increase in the performance.

The cost of holding stocks and providing credit to customers can be a substantial share of a firm's total costs and that is why, for expressing the working capital efficiency, the indicator to be used is „Days of Non-Cash Current Assets". Non-Cash Current Assets mainly includes stocks and accounts receivables. DNCCA indicator shows the period the company's shareholders are locked in stocks or in goods produced and sold until the firm recognizes income from sale of the goods and collects payments from clients and customers (Berman et al., 2008). A shorter period between the purchase of materials, raw materials, fuels, etc. and the collection of sales of goods lead to increased profitability. A shorter period necessary to collect money due from debtors, also leads to better financing of the working capital and to increasing profits.

The workforce impact on overall performance and profitability is expressed by indicator „ Labor Productivity".

The indicator „Debts to Total Assets" is the degree of leverage and shows the company's assets, financed by debt. It represents the funding policy practiced and provides information about the need for external funding of the firm, and the financial risk.

Statistical description and calculation of key indicators used is shown in Table 2.

Table 2.

Variables of the profitability model

Variables	Mean	Ratio
ROA Return on assets, %	0.9	$ROA = \frac{Net\ Profit}{Total\ assets} \cdot 100$
FATR Fixed assets turnover ratio, lei	8.06	$FATR = \frac{Turnover}{Fixed\ Assets}$
DNCCA Days of Non-Cash Current Assets, days, by which: - DINV Number of Inventory days -Number of days Receivables	425 183 > 1 year	$DNCCA = \frac{Non-Cash\ Current\ Assets}{Total\ costs} \cdot 365$ $DINV = \frac{Inventory}{Total\ costs} \cdot 365$
LFP Labor Productivity, lei/person	212961	$LFP = \frac{Total\ venues}{Labour\ force}$
DTA Debts to Total Assets, %	59.4	$DTA = \frac{Total\ debts}{Total\ assets} \cdot 100$
NDTA Net Dets toTotal Assets, %	56.2	$NDTA = Total\ debts - Cash$

Source: companies' financial statements (doingbusiness.ro)

From the above data one may observe that the average profitability of vineyard holdings over the last 5 years was quite low at 0.9%. The average level of indebtedness of the selected vineyard holdings was 59.4% with a size of net debts to total assets of 56.2%. Close levels of the two indicators show that the companies operated with a very low level of cash reserves between 2008 and 2012, having problems with liquidity of assets. The low operational cash flow may be due

to the great average days of non-cash current assets (425 days). The fact that these vineyard holdings turnover their non-cash current assets on much more than 1 year, means that they have long periods of immobilization of funds in inventory and trade debts. The companies hold inventories for 183 days, and especially, they collect with great difficulty the amounts owed by customers (> 1 year), so that they remain as costs until they receive amounts due.

Empirical analysis

The model specifies in eq.1 is estimated using the regression-based framework (White correction for heteroscedasticity) in which Return on assets is used as a comprehensive measure of profitability, and the ratio of capitals-efficient management are the explanatory variables. The results of estimation are reported in Table 3.

Table 3.

Regression of profitability on capitals-efficient management

Dependent variable: ROA (%)		
Explanatory variables	**Coefficient**	**Probability**
FATR (thou lei)	9.566	0.072
DNCCA (days)	0.001	0.102
LFP (thou lei/person)	0.002	0.022
DTA (%)	-0.038	0.039
F stat = 5.963 Prob(F-stat) = 0.000 Adj. R-sq = 0.129		

Source: companies' financial statements (doingbusiness.ro)

The value of F-statistic is larger than its critical F-value (2.463 at the p=0.05 level of significance) and indicates that the model is valid. It shows that 13% of the variation of the Return on assets may be explained in conjunct by the considered independent variables. There are also other important factors of profitability, which were not included in this analysis, i.e., natural capital or other characteristics of social and economic factors that may complete the expression of their efficacy. Two of the variables, namely, Labor productivity (LFP) and Debs to Total Assets (DTA) are statistically significant at 95% confidence level, and the Fixed assets turnover ratio (FATR) is significant for 93% confidence level. The variable representing the management of non-cash current assets (DNCCA) is not statistically significant, indicating that the number of days of investing the Inventory and Accounts Receivable in operating cycle is a factor that may not be considered in the study of profitability of vine holdings. They show a lack of liquidity and relatively low efficiency in the management of non- cash current assets, but which, to some extent, can be justified by long production cycle specific to crop production.

The results of the regression indicate that the vineyards holdings' profitability is the major factor influencing the efficacy of fixed assets, the yield of technical capital contributing to increased production and earnings. They rely mostly on the revenue generated by the investments in fixed assets to generate more profits. The labor productivity also exerts a positive effect on profitability, but its contribution is reduced. It is noted that the performance of the examined vineyard holdings is more fixed capital intensity-related than labor force intensity-related.

Between financing structure and profitability is an inverse relationship, which means that a 10% increase of indebtedness will lead to a decrease in performance by 0.4%. In these circumstances, the use of external sources of finance, as financial leverage of development, can only be used when performing an efficient management of all assets and a higher economic return cost of borrowed capital is achieved. Inverse relationship between profitability and debt levels is

confirmed by the results of other studies, done for companies in various sectors (Kauffman and Tauer, 1986, Deloof, 2003, Goddard et al., 2005, Burja and Burja, 2013).

Conclusions

This work had as main aim to identify the factors that affected the economic performance of representative companies in the Romanian wine sector in the period 2014-2018 and to assess their influence on performance. To carry on the analysis, we estimated the relationship between profitability of vineyard holdings and the factors expressing aspects of effective management of the production factors.

The results of the study show that the overall vineyards holdings in Romania have a reduced profitability. The causes are numerous and come from both the external and the internal environment. The extensive structural, institutional, legislative, etc. changes, initiated by the social and economic reform in the post-communist Romania and the country's access to the EU are the two major events that required radical transformation of agricultural production systems.

Among the internal factors, identified as having a clear negative effect on the performance of vineyard holdings, the indebtedness level may be included. The high level of the indicator shows that the holdings finance their production largely from external sources. They fail to get a return high enough so as to show the leverage of debt, and work with high risk and low financial safe. Another problem is the low efficiency of the management of current assets, the companies showing low liquidity due to capital immobilized in inventory and receivables for periods larger than 1 year, which affects their profitability. This characterizes the production process in agriculture.

The development policy of vineyard holdings aims, to obtain financial impact on account of fixed assets. This approach of increased funding investments has the advantage to increase the productive capacity and creates a potentially high economic and financial future. The investment is expected to generate effects, but adequacy is needed in development strategy, involving a whole complex of elements which often may not be predicted, only highly uncertainly. It is also necessary to carry out a financing structure combining all financial sources at an optimal level, so that increasing funding assets in bank loans should not affect financial autonomy and economic performance.

The appropriate recommendations pursue using efficiently all forms of capital necessary to the company, without neglecting the starting point, which must be the market. The asset efficiency strategy should be completed by the adaptation strategy, which means permanent changes geared to market requirements in parallel with the improvement of technologies and optimizing the financing structure.

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