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THE INFLUENCE OF GRAPES PRODUCTION AND CONSUMPTION ON THE PRICE IN ROMANIA

NICA MARIA¹

Abstract: *In this paper, it is desirable to determine the influence of production and consumption of grapes on the price in Romania. In order to determine this influence, the areas cultivated with grapes, the production of grapes, as well as their consumption in the last years, will be analyzed. With the help of the National Institute of Statistics website data on average grape prices, annual price differences as well as the difference between the price of table grapes and the price of wine grapes can be ascertained. With this data as well as the correlation coefficient, it will be possible to determine the influence of the production and consumption of grapes on the price of this food.*

Keywords: *production, consumption, grape prices, table grapes, wine grapes*

JEL classification: *Q11*

INTRODUCTION

Grapes are wonderful fruits, meant to be sweet, succulent and refreshing. Full of vitamins and minerals, grapes come in different sizes, colors and types and have enjoyed the whole world for centuries. Grapes are known for their versatility and are used to make juice and wine. They can also be dried and eaten as raisins.

Grapes occupy a predominant position in world fruit production, accounting for about 16% of world fruit production. Total grape production is estimated to be about 68.9 million tons.

The costs of viticulture may vary significantly in a region due to differences in cost for land, labor, equipment and materials, and the costs will also be affected by the type of vineyard, grape variety, vineyard spacing, training, pest struggle, and other cultural practices.

Knowing the costs is not enough to make a decision regarding the production of grapes, the potential and profitability of the vineyard must also be taken into account, the profitability of which is directly related to grape prices. The price of grapes is not only a function of the current market, but it reflects the cultivator's ability to market grapes. (Bordelon, 2010).

In grape production, income or return on investment does not start until the fourth year, however, a cultivator has to wait six years for the living to be mature to produce a full yield. The price a grower receives for the grapes he produces is a both quantitative and qualitative function. The total quantity is represented by the tons of grapes harvested and the quality is represented by the sugar content in the grapes. (Kittilsen, 2008)

Today, fresh grapes are consumed worldwide at 24.1 million tons. China is the largest consumer with over 5 million tons of consumption, followed by India and the United States, with consumption of 2.09 million and 1.21 million tons respectively.

In recent years, there has been a significant increase in fresh grape consumption due to the general tendency towards a healthy diet, increasingly rich in vegetable resources. (Cucu, 2017).

The importance of vine cultivation is a special one because it is one of the oldest plants cultivated by humans and unlike other species, it is an adaptable and drought-resistant plant. Grapes are also important because of sugar, organic acids, mineral salts, vitamins necessary for human life, but also for treating many internal and external diseases or for their use in cosmetics. (Iarovoi, 2010).

MATERIAL AND METHOD

Regarding the grape market in Romania, the data on this will be analyzed, using the website of the National Institute of Statistics, and will analyze the total production of table grapes,

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wine grapes, average grape production, consumption and foreign trade of Romania with this food product, but also the average prices of table grapes and wines for the period 2010-2016.

These data will also be analyzed from the point of view of the correlation and the link between them, using the correlation coefficient, which is determined as follows:

$$r_{xy} = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2}}$$

RESULTS AND DISCUSSIONS

In order to analyze the grape market in Romania, the evolution of the vines by vineyards, the evolution of the total grape production, the evolution of the average grape production, the evolution of the average annual and total consumption, the average evolution of the table grape prices, as well as of the of wine. This market analysis was carried out for the period 2010-2016 due to the availability of data on the price of grapes, the data being taken over from the National Institute of Statistics.

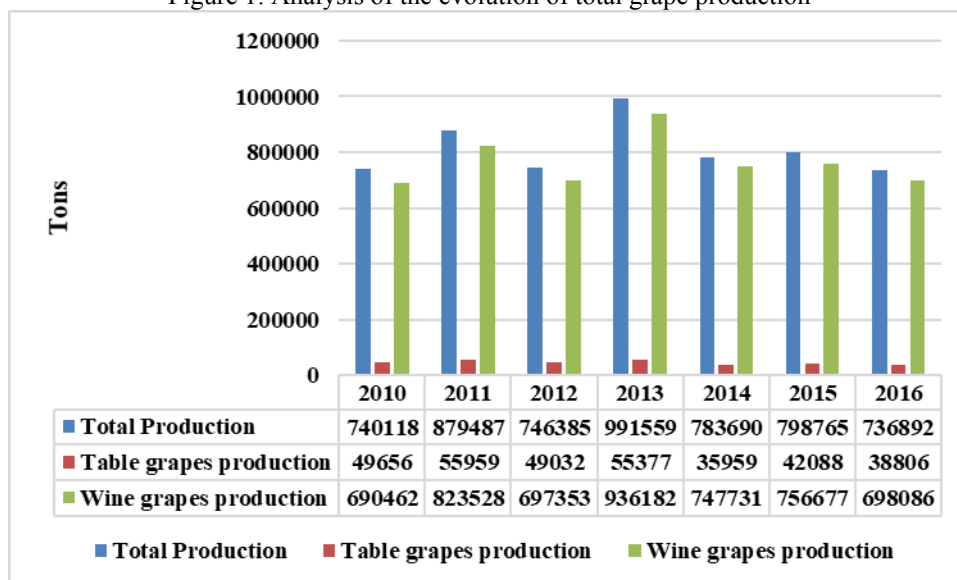
Table 1. Analysis of the evolution of the vineyards on the fruit

The surface of the vineyards on the fruit (ha)	2010	2011	2012	2013	2014	2015	2016
Total	176991	176616	178654	178378	176675	178118	178151
Table grapes	9571	8452	8700	8050	7183	6786	6918
Wine grapes	167420	168164	169954	170328	169492	171332	171233

Source: <http://statistici.insse.ro/shop/>

Regarding the areas under vines, during the analyzed period we can see that there was a relatively constant increase, with an average annual growth rate of 0.11%. Areas cultivated with wine grapes are much larger than those grown with table grapes, being 24.75 times more massive than in 2016 table grapes. The areas cultivated with table grapes registered significant decreases, in 2016 the area cultivated with table grapes was 27.72% lower than the surface cultivated with table grapes in 2010, but the surfaces cultivated with wine grapes registered relative increases constantly, being grown in 2016 by 2.28% more than in 2010.

Figure 1. Analysis of the evolution of total grape production

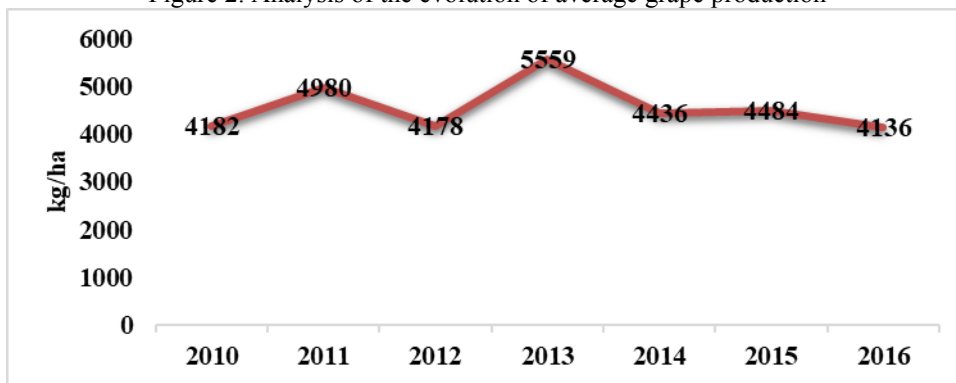


Source: <http://statistici.insse.ro/shop/>

As we can see in the figure above, the evolution of total grape production was oscillating, in 2013 the largest grape production was about 991559 tonnes, and in 2016 the smallest grape production was recorded at about 736892 tons. By comparing the total grape production from 2010 to 2016, it fell by 0.44%, with a negative growth rate of 0.0727% in the period 2010-2016. The

production of table grapes registered a negative growth rate in the analyzed period of 4.0257%, and the production of wine grapes registered an average growth rate of 0.1831%.

Figure 2. Analysis of the evolution of average grape production



Source: <http://statistici.insse.ro/shop/>

The largest average grape production recorded in the analyzed period, as can be seen in the figure above, is in 2013, respectively 5559 kilograms per ha. of grape, and the lowest average grape production was recorded in 2012, respectively 4178 kg / ha of grapes.

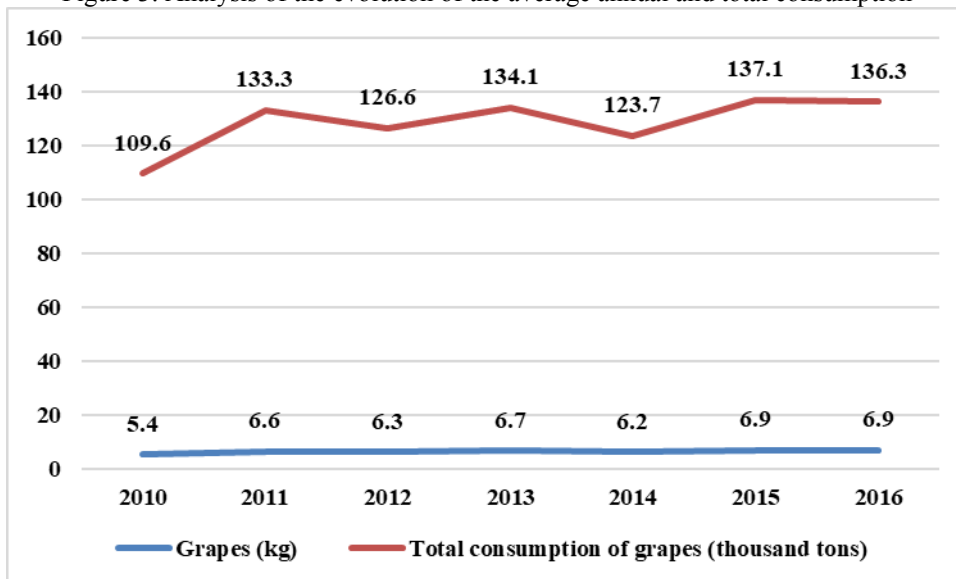
By comparing the average production of grapes in 2010 to that of 2016, it fell by 1.08%, with a negative growth rate of 0.18152% in the period 2010-2016.

The evolution of the total consumption of grapes is oscillating in the period 2010-2016, the highest consumption of grapes was recorded in 2015, ie 137.1 thousand tons, and the lowest consumption registered in 2010, respectively 109.6 thousand tons In the year 2010.

Comparing the 2010 consumption with the 2016 consumption, it increased by 24.41% and the average annual growth rate in the analyzed period was 3.71%. Average consumption of grapes during the analyzed period was 128.7 thousand tons.

Realizing the share of total grape consumption in total production, we can see its proportions. The share of total grape consumption in production oscillated between 13.53% (in 2013) and 18.5% (in 2016).

Figure 3. Analysis of the evolution of the average annual and total consumption



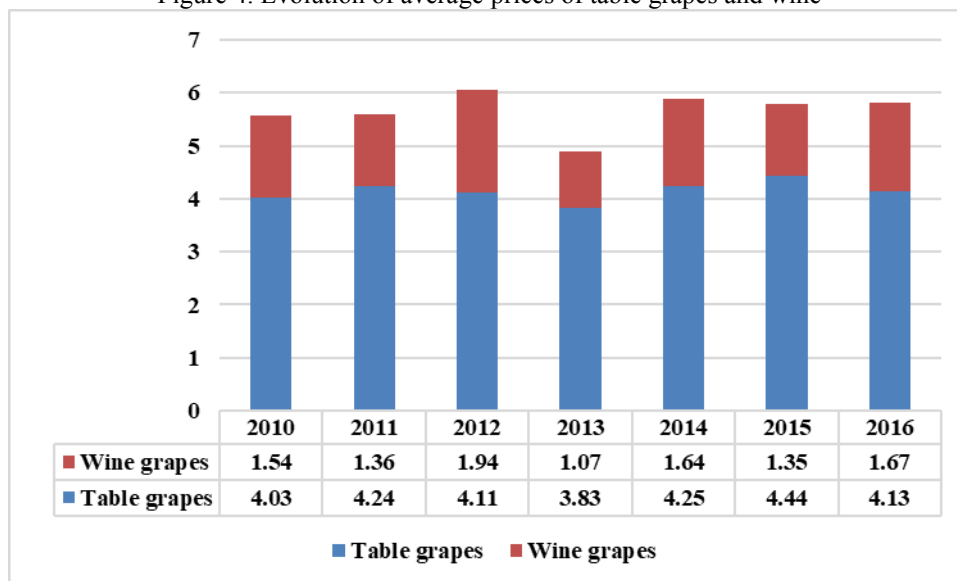
Source: <http://statistici.insse.ro/shop/>

The average annual consumption of grapes registered an increasing trend during the analyzed period, with an average growth rate of 4.17%. The average of this consumption was 6.4

kilograms of grapes per capita. In 2016, compared to the reference year, 2010, consumption increased by 27.78%.

As for grape prices, as can be seen in Figure 4, table grapes have a price 2 times higher than the price of grapes.

Figure 4. Evolution of average prices of table grapes and wine



Source: <http://statistici.insse.ro/shop/>

The wine grapes registered the lowest price in 2013, namely 1.07 lei, because this year saw the largest grape wine production in the analyzed period, namely 936182 tonnes, and the highest recorded wine grape price is 1.67 lei in 2016. The prices of wine grapes are much lower than the prices of table grapes because the grapes are purchased in much larger quantities and at acceptable prices because the wine in turn has a reasonable price, and volume.

Table grapes registered the lowest price also in 2013, namely 3.83 lei, although the largest production of table grapes was recorded in 2011, namely 55959 tonnes, this production being very close to that of 2013, respectively 55377 tons, and the highest recorded price of grapes was in 2015, respectively 4.44 lei.

In order to be able to determine precisely the technical factors (the cultivated area and the production obtained) and the socio-economical (consumption) that most influence the price, the coefficient of correlation between these variables was calculated and analyzed.

Table 2 Determination of the types of links between technical indicators and the price of grapes

Correlation coefficient	Total area	Table Grapes Surface	Wine Grapes Surface	Production	Production of table grapes	Production of wine grapes	Consumption
The price of table grapes	-0.26	-0.51	x	-0.42	-0.51	x	0.25
The price of wine grapes	0.09	x	-0.02	-0.84	x	-0.85	-0.32

Source: own calculations based on INS data

As can be seen from Table 2, both the price of table grapes and of grape for wine, with the total area of grapes, table grapes, and wine, correlated with the production, the total, the table grapes and the wine, but also the consumption.

The price of table grapes is influenced by both the cultivated area and the production, but, as expected, those of table grapes. Both the surface and the production influence the inversely proportional price, being in a medium intensity relationship, both having coefficients of -0.51. As

the surface and production increase, the price of table grapes decreases, as is economically natural, increasing the offer for this product.

Regarding the price of grapes for wine, it is similarly influenced by the price of table grapes, namely the price of grapes for wine is influenced inversely by the surface and production of wine grapes, but the connection is stronger, being the two coefficients - 0.84 and -0.85. Similarly, the higher the cultivated area and the production (the offer), the lower the price of grapes for wine.

CONCLUSIONS

In the present paper we wanted to discover the influence of grape production and consumption on the market price. In the analysis, reference was made to both table grapes and wine grapes. The first part of the paper analyzed the grape offer, analyzing the cultivated areas and the production obtained from them. Both grape and wine grape varieties oscillated during the analyzed period, generally having a slight downward trend, even though the total cultivated area increased during the study period. Also in this first part of the analysis, besides the offer, the demand for grapes on the market was also assessed as the average annual consumption. It has seen an increasing trend over the period under review with an average growth rate of 4.17%. The average of this consumption was 6.4 kilograms of grapes per capita.

In the second part of the study, grape prices for both table and wine were analyzed, even if the table was much higher than the latter, the price of grapes recorded a high volatility, and this has to be considered and analyzed, given that the grapes for wine have a share of over 95% in the total surface area and production.

Analyzing the components of demand and supply, ie consumption and cultivated area or production, which one of them influences most the price of grapes on the market, the correlation coefficient was calculated, as it was expected, the price of grapes was influenced more of the market offer differently depending on the category of grapes, so for table grapes representing about 5% of the offer on the grape market, there was a coefficient of -0.51, but it was significant, as the increase of the offer the price decreases, and vice versa, and for the price of grape wine, which represents the majority of the grape market offer, the correlation coefficient was -0.85, which is a close correlation between the grape price and the market offer, but an inversely proportional relationship as was economically natural.

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