

CHANGES AND TRENDS IN WINE PRODUCTION AND CONSUMPTION IN THE WORLD AND ROMANIA DURING THE PERIOD 2007-2018

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Abstract

The paper analyzed the evolution of wine production and consumption in Romania and at the world level in order to identify the main changes and trends in the period 2007-2018 using official data which have been processed using fixed and variable indices, correlation coefficients, regression functions, consumption/production rate, export/consumption rate, self sufficiency rate and import dependency rate. In 2018, Romania achieved 5.2 M. hl wine ranking the 8th in the EU-28 and the 13th in the world. The world output recovered reaching 202 M. hl. The top wine producers are: Italy, France, Spain, USA, Australia, Argentina, China, South Africa, Chile, Germany, Portugal, Russia and Romania. The area under vine raised, being 191 thou ha in 2018, for which Romania is on the 5th position in the EU-28 and on the 10th position worldwide. The world vine area declined to 7.4 M. ha. After a long depression, wine consumption recovered in 2018 and reached 5 M. hl, ranking Romania the 7th in the EU and the 12th in the world. The top wine consumers are USA, France, Italy, Germany, China, United Kingdom, Russia, Spain, Argentina, Australia, Portugal and Romania. World consumption remained relatively stable, 246 M. hl, being high in the main producing countries. Romania is ranked the 8th in the world for 29.9 l consumed per capita, but Romanians drink 1.5 times less wine than Portuguese, French, Italians, Swiss, Belgians and Australians. Romania's wine production, areas under vine and wine consumption have a positive impact on the world performance as proved by the correlation and determination coefficients, and regression functions. In 2017, in Romania, the trade internationalization rate was 3.58%, the self sufficiency rate 92.32 % and the import dependency rate 10.86 %, which justified the wine import in small amounts. At the world level, 44 of 100 l wine are consumed from import. Wine production and consumption is expected to grow to satisfy better consumers' needs.

Key words: trends, changes, wine, production, consumption, world, Romania

INTRODUCTION

Wine is defined as "an alcoholic drink made of grapes which have been fermented grace to yeasts which converts sugar into ethanol, carbon dioxide and heat. Depending on the grape variety or hybrid and yeasts strains, wine could be of different types [9].

The history of wine dates back more than 7,000 years ago, in the Old Caucaz, Mesopotamia, Egypt, Iran, Greece, Italy, and even in China. The proofs found in Iran attested that wine was largely produced in the Neolithic era (around 5,400-5,000 BC) in Hajji Firuz Tepe [32].

The ceramic fragments including wine components in their texture, discovered in Georgia, proved that wine was preserved in ceramic bowls even since 5,980 BC [2]. In the

archeological excavations made in Armenia, there were found *Vitis vinifera* seeds, a grape press, bowls for fermentation etc which proved the existence of the first vinery dating from 4,100 BC.

In Egypt, in Tutankhamun's tomb there were found jars of wine produced in the Nile Delta as in the old times, the pharaohs were buried together with their favored wines. Also, other proofs were found in Lebanon regarding the development of wine industry.

Vine was first in an wild form, but when the natural fermentation of carbohydrates into alcohol have been discovered, this was the crucial moment which convinced humans to domesticate it and pass to wine technology.

In Europe, the oldest land of the wine is supposed to be the ancient Thracia as here there were found traces which attest that vine

culture was a basic activity of the population living the Carpathian and Danube region even since the second millennium BC, as affirmed A. Griesbach, B.P. Harden and R. Billiard [32, 35].

Being the best navigators and traders, the Greeks have promoted and traded wine in the Mediterranean countries. During the Roman Empire, wine was also very much appreciated on various occasions and even sung by poets.

The vine was successfully cultivated in France and Germany, and from Spain it was spread to Americas. In this way, wine production and consumption increased from a period to another across the centuries. The appearance of *Phylloxera* determined the European producers to cross the local varieties with American rootstocks and to create resistant hybrids to this pest [8].

"Wine is unique and a symbol of geography, history and culture of the region of its origin. Wine was considered the saint nectar of the Gods, the beauty of a region, the sublime stimulus of our senses. Dionysos and Bacchus were the Gods of Wine for Greeks and Romans, and wine was used during celebrations, religious sermons, and also like food and medicine, being a magic and essential drink in the Mediterranean life style".

Wine production and trade have flourished in Europe where Bordeaux, Porto, Burgundia, and Tuscany have become well know producing and delivery centers and nowadays, wine is a part of our life and culture.

Wine content offer it a harmonious and perfectly balanced mixture of features such as: flavor, savor, acidity, sweetness, tannins [7].

Wine is frequently used as "a food adjacent" and what could be more pleasant than to taste a dish and feel the pleasure of a meal accompanied by a glass of wine". The assortment of wines with food

has become a real science and art to enhance the dining experience.

Wine is a healthy food and a moderate consumption is recommended to avoid the risk of heart and Alzheimer diseases. It is the greatest of medicine and where wine is lacking, drugs are necessary [30, 31].

The American experts consider that in a glass of wine could be found important diet components such as: 24-25 energy, 0.2-0.4 protein, vitamins: 0.7-0.9 B₁, 2-2.5 B₆, 0.5 B₁₂, 1 Folate, Niacin 0.5-0.7, Ca 1, Iron 2.2-4.4, Ph 1.8, Zn 0.5-0.8 [32].

All these arguments are for sure the strong reasons why vineyards and wine production have developed across the time to meet the market requirements worldwide.

During the last two decades, the world wine production have registered a strange evolution characterized by high and low levels, mainly determined by the climate change and specific conditions in the producing countries.

From 278.8 million hl in the year 2000, the top level of 297.7 million hl was attained in the year 2004, and then production declined reaching the lowest level of 258 million hl like in the year 2012, but in 2013 a new output peak of 290.1 million hl was achieved. Since 2014, the world wine production went down, registering a catastrophic level in 2017, but in the year 2018, it was recorded the highest performance of 292 million hl.

Europe is the core of world production keeping 70% due to the EU-28 which is the main contributor with 60 % market share in the world wine output. The major producing countries: Italy, France, Spain have 48.1 % market all together. Besides the "leaders" of wine production mentioned before, other EU member states like Germany (3.5%), Portugal (1.8%), Romania (1.8 %), Hungary (1.2 %), Austria (1.06%), and Greece (0.75%) are important producers. On the American continent USA (8.4%), Argentina (5.1 %), Chile (4.6%), and Brazil (1.06), and we have to add Australia (4.4%), New Zealand (1.06%) and South Africa (3.3%) which also brought an important amount of wine to the world production [16, 37].

However, after a long period of continuous growth, the world wine consumption remained stable at the level of 2017, meaning about 246 million hl. In the main producing countries, wine consumption declined, while in the USA and China it registered an important growth. The difference of 46 million hl between production and

consumption is used for producing spirits, vinegar, and for assuring wine stocks [10].

Romania has a long tradition in producing wine and it is among the well known major producers and consumers in Europe and in the world, but it is not among the major exporting and importing countries as long it produces relatively enough wine for covering the internal market needs but not substantial amounts which could be delivered in the international market.

In this context, the objective of the paper was to present an analysis of wine production and consumption in Romania and also at the world level in the period 2007-2018 in order to identify the major trends, similarities and discrepancies, and the correlations existing among various indicators, the changes in production and consumption in Romania and in the major producing countries and states where wine is preferred the most.

MATERIALS AND METHODS

Study area.

Vitis vinifera cultivation and wine producing in Romania dates back more than 4,500 years ago.

"Tracia, was a viticultural region as it was considered the birth place of Dionysos" as sustained the historian A.D. Xenopol (1847-1920) and "vine culture was a traditional activity of the Thracs" as mentioned Nicolae Iorga (1871-1940). Strabon (66 BC-24 AC) mentioned that foreign populations were very much attracted by the vineyards of Dacia (the old territory of nowadays Romania) so that the King Burebista (82-44 BC.) decided to deforestate a part of the vineyards. Since the year 106, the Roman occupation contributed to the development of viticulture and vinification by means of the advanced techniques of vine cultivation and grape processing into wine as attested by "Dacia Felix medal", issued under The Emperor Traian (53-117)), and another medal issued under the Emperor Decius (201-251). In the Middle Age, the development of viticulture and wine making has continued on the Romanian territory as sustained by

A.Verancsics (1504 -1573) and M.Bandini (1593-1650) [20, 35].

Along the centuries, vine growing and wine culture flourished inside Romania's frontiers, but also it has been promoted abroad by the quality, taste, flavor and other specific features of the Romanian wines which got golden medals in international competitions and were very well appreciated at the International fairs.

Romania's membership to OIV since 1928 is a guarantee of its prestige as an important wine producer in the world. The favorable conditions, the mild climate, the rich soils, the exposure of the slopes in the hilly areas, the good production potential of the local and imported vine varieties have led to a high performance in grape and wine production. That is way vine cultivation, wine producing, purchasing and trading have become a real business. However, there are still some critical aspects in viticulture and vinification related to the fragmentation of the land in small plots, the small size of the vineyards, the increasing percentage of the vine hybrids, the climate change producing droughts and rainfalls and other extreme meteo phenomena, the lack of labor force in spring season for plantations maintenance and at grape harvesting, as many workers prefer looking for a better paid job abroad.

The open frontiers after 2007 favored the import of wine brands which have enlarged the offer on the domestic market seeking for a new segment of wine consumers.

Data collection.

For setting up this study, the empirical data have been picked up from international and national official authorities providing information such as: International Organization of Vine and Wine (OIV), National Institute of Statistics (NIS), and Ministry of Agriculture and Rural Development (MADR).

The study was based on a large range of articles, books, textbooks, and sites delivering useful and updated information on wine production and consumption, the principal ideas being presented in this study and cited accordingly.

The period of reference of the analysis was 2007-2018.

The main indicators taken into consideration have been: (i) wine production in Romania and at the world level, the major producing countries and Romania's position in the world and in the EU; (ii) surfaces covered by vineyards in Romania and at the world level, the main countries with areas under vine, and the position of Romania in the world and in the EU; (iii) total wine consumption in Romania and its distribution by macroregions of development, wine consumption in the world and the top countries based on the records for this indicator, the position of Romania and in the world and in the EU; (iv) average wine consumption per inhabitant and year in Romania, in the world, in the main consuming countries, and Romania's position for this indicator; (v) average monthly wine consumption in Romania and its distribution in the territory by macroregion; (vi) average monthly expenditures for wine per household in Romania and its situation in the territory; (vii) average annual amount of wine bought per household in Romania and in the territory; (viii) consumption/production ratio in Romania and at the world level; (ix) export/consumption ratio in Romania and at the world level; (x) self sufficiency rate in Romania; (xi) import dependency rate in Romania.

The used methodology included:

-*Fixed basis index* was utilized to analyze the growth or decline at the end of the period compared to the level in the first year of the analysis;

-*Variable basis index* was used to explain the variations in different years compared to the previous levels;

-*Correlation coefficients and the determination coefficients* were determined between Romania's production and world production of wine to identify in what measure the level recorded by this country has an influence on the world level;

-*Regression equations* were used in the same purpose as mentioned above and for quantifying how much world production and consumption with increase or decrease due to

the variations of these two indicators in Romania.

-*Consumption/Production Ratio (C/P R)* in Romania and at the world level was determined in relative values, according to the formula: $C/P R = C/P * 100$;

-*Export/Consumption Ratio (E/C R)* in Romania and at the world level was calculated in relative value, using the formula: $E/C R = E/C * 100$;

-*Self Sufficiency Rate (SSR)* in Romania was determined in relative values using the mathematical relation: $SSR = (Production * 100) / (Production + Import - Export)$

-*Import Dependency Rate (IDR)* in Romania was estimated in relative values using the formula:

$IDR = (Import * 100) / (Production + Import - Export)$.

RESULTS AND DISCUSSIONS

Wine production. Wine production in Romania registered large variations along the analyzed interval. In 2007, it accounted for 5,289 thousand hl, but in 2008 it reached the maximum level, i.e. 5,369.2 thousand hl. Then, wine production started to decline till 2010, when it reached the minimum level of 3,287.2 thousand hl, as a consequence of a combination of factors such as: economic crisis, on one side, and climate change, on the other side. In 2010, it represented 62.1 % of the 2007 level. In 2011, the achieved wine production was 4,058.2 thousand hl, by 23.3 % less than in 2007, but by 23.4 % more than in 2010.

In 2012, it declined again because the year was facing a terrible drought, but the grapes sugar content increased favoring sweeter wines. 2013 was a good year for wine production which raised by 54.4 % compared to 2012, but it was still by 3.4 % lower than in 2007.

Since 2014, wine production started to decrease again and continued this dynamics in 2015 and 2016 too. In 2016, it reached 3,267 thousand hl, by 38.3 % less than in 2007, and this was the minimum level carried out in the

analyzed period, as 2016 was a drought year which deeply affected the output. In 2017, wine production improved its level reaching 4,264.1 thousand hl by 30.5% more

than in 2016, but by 19.4 % less than in 2007. At last, the year 2018 was the most favorable so that wine production returned to its level of 2007, accounting for 5.2 million hl (Fig.1).

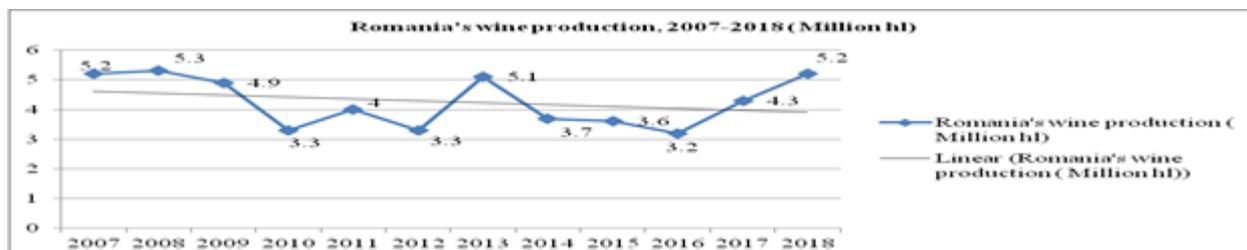


Fig.1. Wine production, Romania, 2007-2018 (Million hl)
 Source: Own design based on the data from [10, 11, 14, 15, 16].

For its wine production, Romania ranked the 13th in the world, with a 1.78 % market share, after Italy, France, Spain, USA, Australia, Argentina, China, South Africa, Chile, Germany, Portugal and Russia. It also ranked the 5th in the EU-28 for 3.07 % market share. The evolution of wine production in Romania followed the general trend at the world production of wine. In the period 2007 -2013, the world wine production recorded a descending trend with

the lowest level of 258 million hl in the year 2012. And this happened in the EU too, but it succeeded to keep its leader position in the world [18, 19]. The world production of wine was facing an important decline since 2013, with the lowest level accounting for 250 million hl in 2017, but the year 2018 brought a smile on the producers' face and a higher profit in the bank account for a top wine output of 292 million hl (Fig.2.).

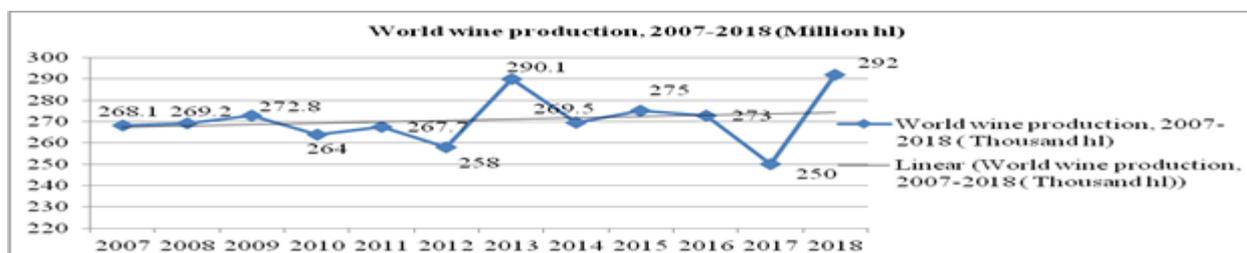


Fig.2. World wine production, 2007-2018 (Million hl)
 Source: Own design based on the data from [10, 15].

Between the world and Romania's wine production it was found a correlation coefficient, $r = 0.439$, reflecting a moderate positive relationship, and the determination coefficient $R^2 = 0.1936$ showed that only 19.36 % of the variation of the world production depended on the variations of the wine production in Romania. The regression equation proved the same, more exactly: $Y = 6.1467 X + 244.61$ showed that an increase by 1 unit of Romania's production could grow the world production by 6.1467. The difference of 80.64 % of the world wine production variation is determined by the

variations in production resulting from other wine producing countries.

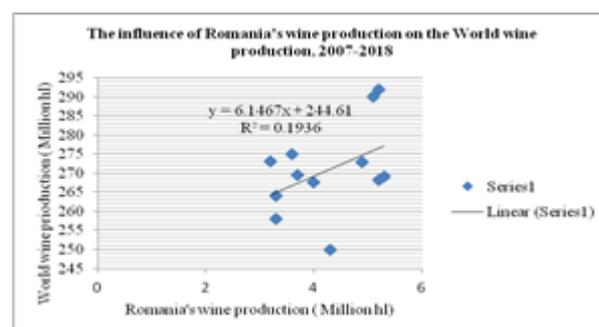


Fig.3. The impact of Romania's wine output on the world wine production, 2007-2018
 Source: Own design.

It is about the production achieved in Italy, France and Spain, which are the principal countries with a record wine output in the world, in 2018, accounting for 19%, 17 % and respectively 15% in the world output. Also, another group of states; USA, Argentina, Chile, Australia and Germany contributes by 24 % to the world wine performance, and finally other countries among which we may find Romania covering the remaining difference of other 24 %. The positive variations in the top three countries have had a good impact on the world production, also the good output levels in the USA, Argentina, Chile, Germany and Romania had a positive impact, but the weak levels in South Africa and China influenced in a negative manner.

In the analyzed period, Romania's wine production was influenced first of all by climate change, higher and higher temperatures every year in summer season, freeze temperatures in spring at blooming or unexpected rainfalls in autumn before harvesting which affected yield.

The climate change in Romania determined

research to find solutions to adapt vine growing to the new conditions. New varieties resistant to draft have been studied in the experimental plots of well know research and development stations. It was pointed out how important is to use high quality vine varieties adapted to the local conditions to get a higher economic performance in the vineyards in terms of grape yield, production and wine [4, 5, 23, 24].

Also, a tendency to use vine hybrids in the small households, the old plantations, the inadequate investments in new vineyards and the disruptions regarding the application of the technologies ahev also had a negative impact on production.

However, wine production in Romania was positively influenced by a slight increase of the cultivated surface with vine, 2.45 % from 178.1 thousand ha in 2007 to 182.5 thousand ha in 2017 and 191 thousand ha in 2018 (+7.2 % versus 2007), grace to the Government measures to stimulate viticulture development according to the Reconversion National Programme (Fig.4.).

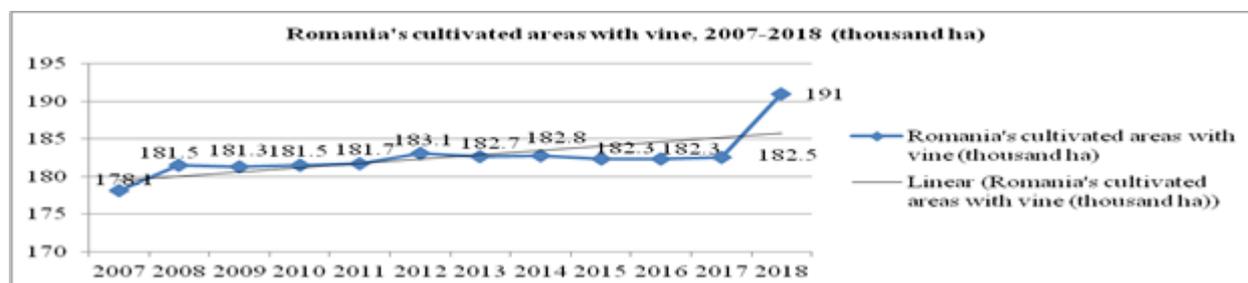


Fig. 4. The vineyards surface in Romania, 2007-2018 (Thousand ha)

Source: Own design based on the data from [10, 11, 16].

For its area covered by vineyards, representing 2.5 % of the world surface with vine, Romania came on the 10th position after Spain, China, France, Italy, Turkey, USA, Argentina, Chile and Portugal [1].

In the EU-28 area under vine, 3,194,267 ha in 2017, Romania ranked the 5th for the area with vineyards, representing 5.7 %, after Spain (30%), France (24.8%), Italy 20.2 % and Portugal (6.04 %). In the EU, the surface with vineyards has been relatively stable during the last years [6].

But, comparing to the general decreasing trend of the world surface with vineyards, in

Romania it is a predominant increasing tendency, and the figure recorded in 2018 of 191 thousand ha was the consequence of the increased number of new plantations.

At the world level, in 2018 there were 7.4 million ha of vineyards, by 3.37 % less than in 2007. This was due to the variations in surface in different countries where *Vitis vinifera* is cultivated. In general, the surface with vine plantations is relatively stable in Spain, France, Italy, USA, Germany, it is decreasing in Portugal, Turkey and Greece, and it is growing in China, Argentina, and Chile (Fig.5.).

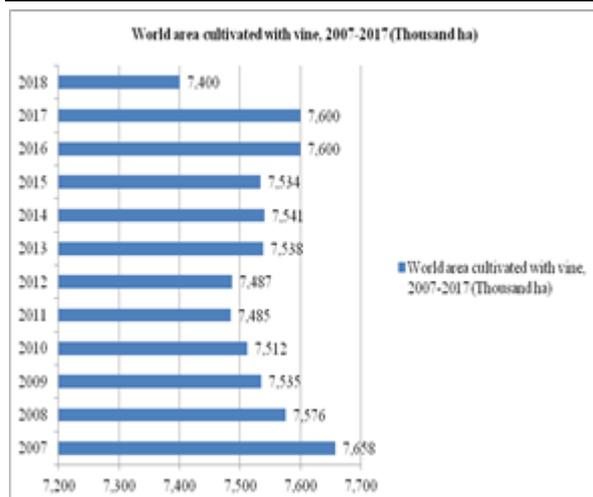


Fig. 5. The vineyards surface in the world, 2007-2018 (Thousand ha)

Source: Own design based on the data from [1, 10, 34].

Taking into account the different tendencies regarding the evolution of the surface with the vine plantations at the world level and in Romania, the correlation coefficient, $r = 0.789$ attested that the increased surface in Romania will have positive effect on the world surface. This was also, confirmed by the determination coefficient, $R^2 = 0.6235$, which reflected that 62.35 % of the variation in the world surface with vineyards is influenced by the variation in Romania's surface cultivated with vine.

The regression equation $Y = -17.763 X + 10,782$ tells us that a decline by one unit of Romania's surface with vineyards will determine a reduction of the world area cultivated with *Vitis vinifera* by 17.763 units (Fig.6).

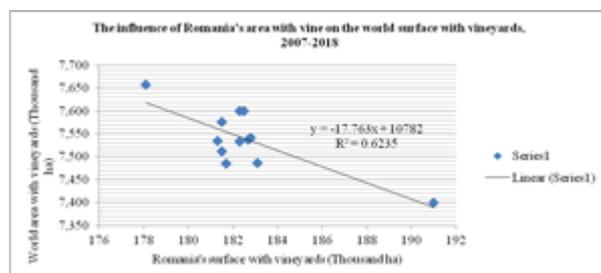


Fig. 6. The impact of the vineyards surface in Romania on the world surface with vine plantations, 2007-2018

Source: Own calculation.

Therefore, the difference of 37.65 % of the variation in the world surface with vine will be determined by the variation of the cultivated surface in the other producing countries.

In Romania, the vineyards are distributed in a varied manner in the territory taking into consideration the unfavorable and non favorable growing conditions.

Of the 191 thousand ha of vine plantations, 36.8 % are on the Moldova Hills, 29.3 % are on the Muntenia and Oltenia Hills, 9.2 % are on the Dobrudgea Hills, 7.2 % on the sandy and other favorable areas in the Southern Romania, 6.1 % are on the Danube River terraces, 5.4 % are on the Crisana and Maramures Hills, 3.8 % are in the Transilvania Plateau and 2.2 % are on the Banat Hills [29].

Of the total 4,264.1 thousand hl wine carried out in 2017 in Romania, 65.6 % came from the noble varieties and 34.4 % from vine hybrids.

To the 2,786.6 thousand hl wine obtained from vineyards growing noble varieties, the contribution of the viticultural regions was the following one; 43.8 % the Moldova Hills, 25.3 % the Muntenia and Oltenia Hills, 11.3 % the Transilvania Plateau, 9.2 % the Banat Hills, 6.5% the Dobrudgea Hills, 3.8 % the Crisana and Maramures Hills and 0.15 % the Danube terraces and other 0.15 % the sandy and favorable soils in the South of the country.

Of the total 2,798.6 thousand hl wine produced by the noble varieties, 67.2 % represents white wine, which is dominant in the production structure by wine color, followed by 25.4 % red wines and 7.4 % rose wines [11].

Romania has many vineyards, but the main wine producers are Murfatlar, Constanta County, Jidvei, Alba County, Cotnari, Iasi County, Vincon, Vrancea County and Tohani, Prahova County whose market share accounts for 70 % in the whole wine output [12].

Wine consumption.

Wine consumption in Romania has followed an oscillating variation from a period to another. The analyzed period is a good example in this respect. In 2007, the wine consumption accounted for 5,526.3 thousand hl and it increased in the next year to the peak of 6,500 thousand hl. After 2008, it started to decrease, and the lowest level being registered

in 2010, i.e. 3,282.8 thousand hl. This decline was caused by the economic crisis which increased unemployment and diminish the income per household.

After that, wine consumption restarted to grow till 2013, when a new peak of 5,113.3 thousand hl was reached. Since 2013, wine consumption declined, may be due the beer competition in the hot months and its more convenient price or due to the new orientation of the consumers to wine of high quality,

more costing, but more pleasant, a smaller quantity and a higher satisfaction.

This decreasing tendency looks to be similar to the descending trend of wine consumption in the EU and in the world.

In Romania, in 2017, wine consumption was 4.1 million hl, representing 74.19 % of the level attained in 2007. But the year 2018 was a surprising one because consumption reached 5 million hl, but still by 9.6 % smaller than in the year 2007 (Fig.7).

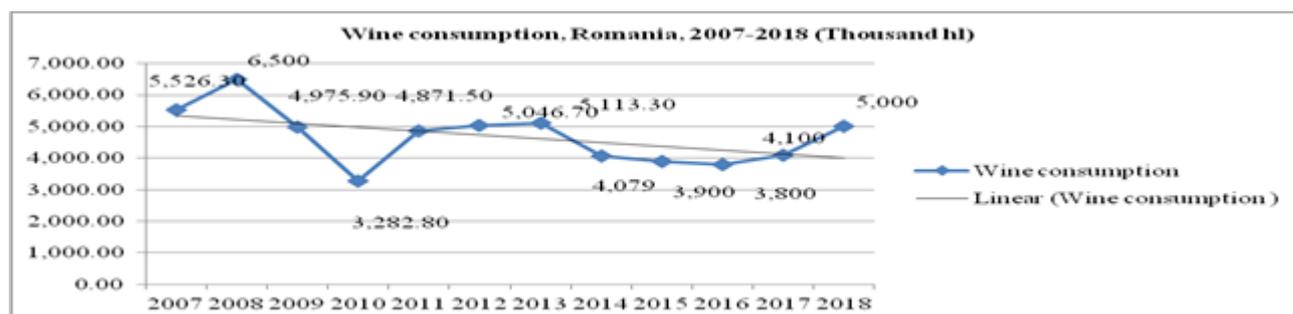


Fig.7. Wine consumption in Romania, 2007-2018 (Thousand hl)

Source: Own design based on the data from [10, 11].

In 2018, for the level of wine consumption, Romania ranked the 12th in the world, after USA, France, Italy, Germany, China, United Kingdom, Russia, Spain, Argentina, Australia and Portugal. Its share in the world wine consumption accounted for 2 %.

At the world level, wine consumption reached 246 million hl in 2018 being almost equal to the level recorded in 2017. However, at the world level the decreasing trend started many years ago and in 2007 and 2008 it was stabilized at 250 million hl, but then it continued to do down year by year reaching

the minimum level of 239 million hl in the year 2014. After that, it restarted to increase slightly from a year to another reaching 246 million hl in the year 2018. This recovery was determined by an increased consumption in the Asian countries and also in the Western European states.

Therefore wine consumption at the world level has not varied too much, as in 2018 it was by 1.6 % less than in 2007. It have been stabilized at a level ranging between 240-246 million hl (Fig.8).

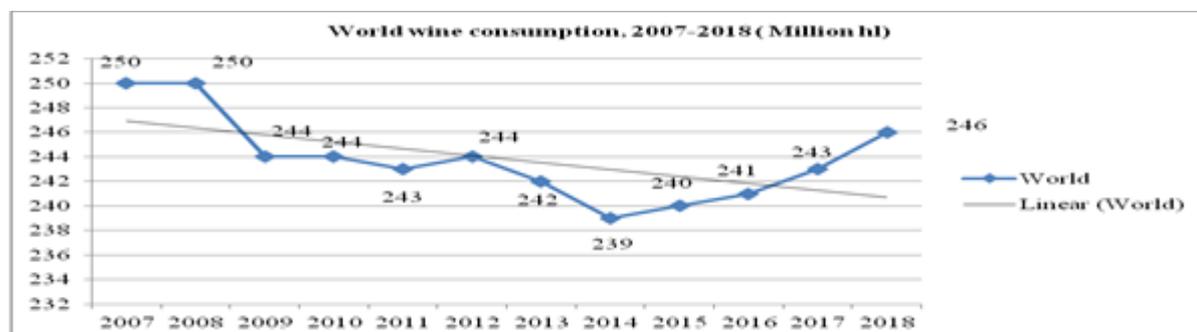


Fig. 8. World wine consumption, 2007-2018 (Million hl)

Source: Own design based on the data from: [10, 37].

At country level, wine consumption differs. The USA is on the top position as the wine

consumption represents 13.4% of the world level, France came on the 2nd position with

10.8%, Italy with 9.1 %, Germany with 8.1 %, China 7.3 %, United Kingdom 5.04%, Russia 4.8%, Spain 4.4 %, Argentina 3.4 %, Australia 2.5 %, Portugal 2.2 %, and Romania 2 %. Therefore, the consumption in all these 12 countries together accounted for 73 % of the world wine consumption.

In the USA wine consumption has a visible ascending trend with a chance to continue its growth in the future. In Italy and China, during the last three years consumption is on an ascending trend, and in Spain restarted to grow. In Australia it keeps its increasing trend. However, in France, Germany and United Kingdom it continues to remain at a relative constant level.

The correlation coefficient between the wine consumption in Romania and the one at the world level is a positive and string one, $r = 0.741$. Also, the coefficient of determination, $R^2 = 0.5491$ pointed out that 54.91 % of the variation in the wine consumption in the world is influenced by the variation of the consumption in Romania. The regression equation $Y = 2.8953 X + 230.28$ reflected that an increase by one unit of the wine consumption in Romania will contribute to the growth of the world consumption by 2.8953 units (Fig.9).

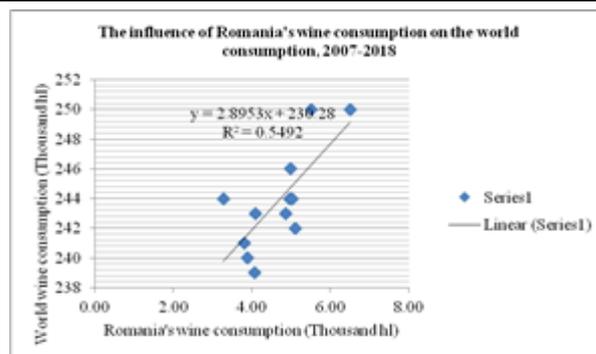


Fig. 9. The impact of Romania's wine consumption on the world consumption, 2007-2018

Source: Own design.

Average wine consumption per inhabitant

registered a general declining trend between the year 2008 and 2016. If in 2007, a Romanian over 15 years old consumed 24.1 liters wine per year and in 2008 25.8 liters, when the economic crisis started and its effects affected the income per household, the Romanians began to consume less wine and changed their habits consuming more beer which is cheaper than wine. The lowest consumption level, 18 liters/capita, was registered in 2016. After this year, the family budgets have slightly increased and wine consumption has started to recover as well, so that in 2017, wine consumption accounted for 20.5 liters and in 2018 for 29.9 liters (Fig.10).

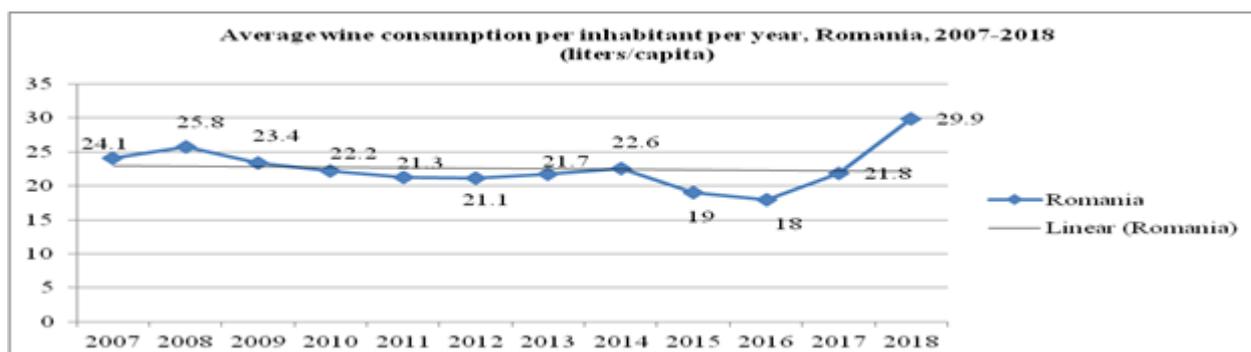


Fig. 10. Average wine consumption per inhabitant and year, Romania, 2007-2018 (Liters/capita)

Source: Own design based on the data from: [10, 13].

For its consumption per inhabitant per year of 29.9 liters in 2018, Romania ranked the 8th, compared to the 10th in 2017 for 20.5 liters. Therefore, average consumption in Romania has substantially increased by 45.8 % from 2017 to 2018.

However, in 2018, a Romanian drinks 2 times less than a Portuguese, 1.67 times less than a French, 1.45 times less than an Italian, 1.26

times less than a Swiss, 1.05 times less than a Belgian or an Australian [27].

If we look at the figures presented in Fig.11, one may notice that the wine consumption in 2018 has registered a considerable increase in almost all the countries representing the top consumers. More exactly, the change by country was the following one: Portugal 38 %, France 25.5 %, Italy 14.7 %, Switzerland

18.1 %, Belgium 27.5%, Austria 27.5 %, Romania 45.8 %, Hungary 42.9 %, Sweden 27.1 %, Germany 12 %, Spain 22.2 %, Argentina 24 %, Netherlands 13.2 % and United Kingdom 13.5%.

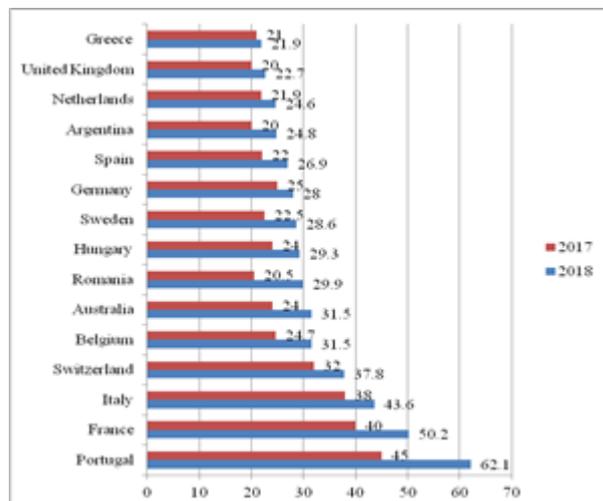


Fig. 11. Average wine consumption per inhabitant per year in the main consuming countries in 2018 versus 2017

Source: Own design based on the data from [19, 17, 36].

The average wine consumption in the world accounted for 3.5 liters/capita in 2017 but in 2018 it declined to 3 liters.

But, in the world there are also countries where average wine consumption is very small. It is about the Islamic countries such as Pakistan, Yemen, Afganistan, Syria, Bangladesh, Eritrea, Egypt, Sudan, Saudi

Arabia where consumption ranges between 0.00019 liters in Pakistan to 0.00354 liters in Saudi Arabia [28].

Considering consumption in terms of number of bottles of 0.75 liters, a Romanian consumer drinks only about 29 bottles of wine a year compared to the top consumers in the world: Norfolk Island 77.8 bottles, Vatican City 76, Andorra 66, Croatia 63.3, Portugal 61.8, Slovenia 57.5, Macedonia 55.2, France 54.4, Switzerland 50 and Italy 50 bottles [3].

In Romania, the average monthly wine consumption per inhabitant varied between 0.933 liters in 2008 to 0.892 liters in 2017, according to National Institute of Statistics [13]. (Fig.12).

The wine consumption varies from a region to another depending on the local traditions in vine growing and producing, urban or rural environment, education level, age structure of the population and income level per household.

The highest average wine consumption/month is in the South West region (about 2 liters), followed by the North Eastern region (1.5 liters) and the lowest level in the West region (about 0.25 liters).

In the analyzed period, the highest average consumption was found in the macroregion of development M2, with a general increasing trend from 1,330 l/capita in 2008 to 1,396 l in 2017 (+5%).

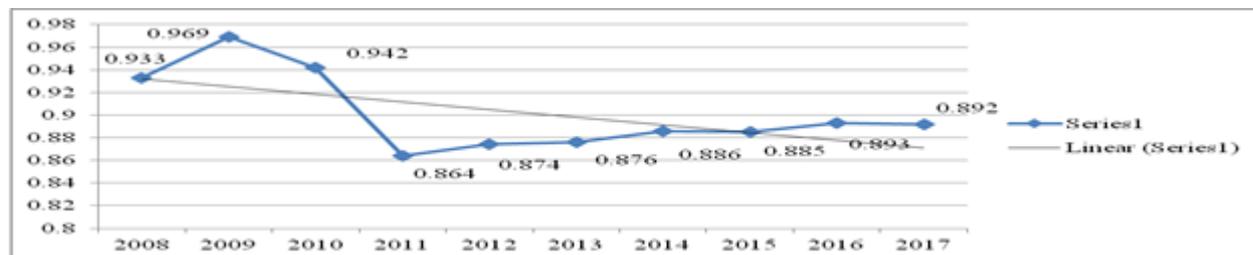


Fig. 12. Dynamics of average monthly wine consumption in Romania (liters/inhabitant)

Source: Own design based on the data from [9].

On the 2nd position came the macroregion M4 where the average wine consumption per month varied between 1.165 liters in 2008 to 0.919 l in 2017, reflecting a decline (-21.2 %). On the 3rd position was situated the macroregion M1 where the average monthly

consumption increased from 0.546 l/capita in 2008 to 0.676 l in 2017 (+23.8%). At last, the macroregion M3 ranked the 4th for 0.542 l/capita in 2017 by 17.9 % less than in 2008 (0.660 l/capita).

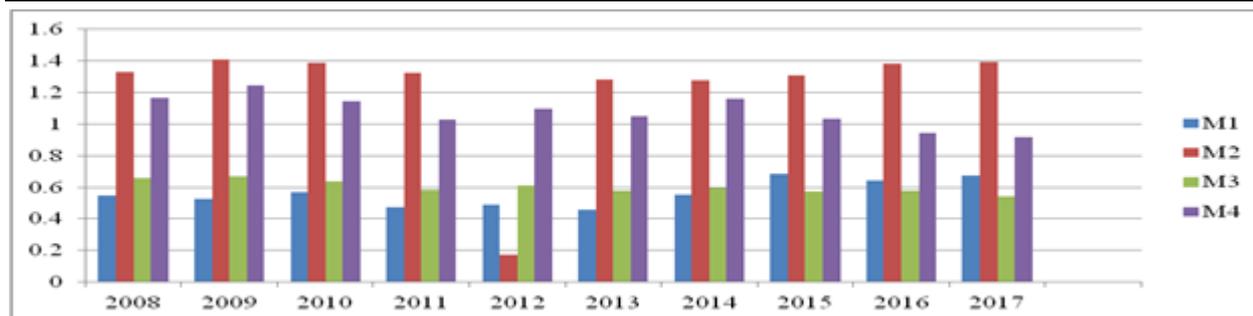


Fig. 13. Dynamics of average monthly wine consumption by macroregion of development in Romania (liters/inhabitant)

Source: Own design based on the data from [9].

Depending on the environment where the people is living, in Romania wine consumption is different in the urban areas compared to the rural ones.

In the rural areas, wine consumption in the rural areas is higher than in the urban localities, because most of the households have small or large surfaces under vine and produce wine for family needs and this production and consumption is not recorded in the official evidence.

More than this, in the rural areas, wine is also bought from shops, but in the most cases it is about the cheapest wine of lower quality, taking into account the lower income level of the rural population.

In the urban environment, people has a higher income and prefer to drink a higher quality wine, but less, most of wine bottles being purchased from supermarkets and have a controlled origin.

Age is another factor which creates differences among people regarding wine consumption. In general, the young people of 15-24 years old used to drink about 0.4-0.5 liters of wine per month, while the people older than 65 consume 1.1-1.2 liters/month.

The education level could also influence wine consumption. In general, the people having a lower education level consume more wine per month compared to the people with the highest education level. Regarding the wine consumption habits, the people with a higher education level prefer to drink wines of a higher quality and less, therefore they are tempted to pay more for a bottle of wine compared to the people who is less educated.

Income level is the key factor influencing the purchasing decision and of course, consumption. The persons earning a higher income per month are tempted to pay more for a bottle of a high quality wine, but to consume less. The people having low earnings prefer to buy cheap wines and to consume more.

The household size has also an impact on consumption habits. In general, the larger the household, the lower the wine consumption. The families consisting of two members drink more wine (1.1-1.3 liters per month) than a larger household.

In Romania where summers are hot, and winters are cold, it looks that there are seasonal differences regarding wine consumption. In summer season, the people is tempted to consume more beer, in the fall and winter months and in spring season around Easter, the Romanians prefer to consume more wine.

Therefore, in Romania, wine consumption has large variations, but the general trend is a declining one, except the years 2017 and 2018 when it looks a recovery of return to Bachus' elixir.

This is a similar tendency with the one in the EU member states and at the world level. Probably the diminished wine consumption was due to the wine price, the competition of beer and the living standard. In the countries where the population has a higher living standard, wines are of a higher quality, are more expensive and this could be a reason to consume a smaller amount but to pay more for a good wine and have a special satisfaction drinking a glass of wine [12].

In terms of the level of spendings for drinking wine, there are also large variations among people. The record in the world is kept by Norfolk Island, close to Australia and New Zealand, where the expenditures for wine accounts for about £ 486/capita and Switzerland where the people pay a little less, £ 462/capita [3].

The annual wine consumption in terms of the number of bottles of 0.75 liters per inhabitant, Romania is not among the top consumers in the world like: Norfolk Island (77.8 bottles), Andorra (66), Croatia (63.3), Portugal (61.8), Slovenia (57.5), Macedonia (55.2), France (54.4), Switzerland (50) and Italy (50) [3].

In Romania, the average number of wine bottles consumed per year by a person is 29. But, we have to consider that this figure does not reflect the reality, because in Romania it is commercialized not only bottled wine, but also bulk wine, and in the country side, the

people practice "barter" many times, so that it is not possible to exactly calculate wine consumption.

Average amount of wine purchased per household in Romania increased from 0.199 liters in 2008 to 0.268 liters in 2017 (+34.6%), but there are variations from a macroregion to another. While in the M2 macroregion, the level of this indicator increased from 0.252 liters per household to 0.286 liters (+13.4%), in the macroregion M3 it increased from 0.259 liters to 0.297 liters (+14.6%), in the macroregion M4 it raised from 0.113 liters to 0.196 liters (+73.4%) and in the macroregion M1 it also raised but from 0.141 liters to 0.273 liters (+93.6%).

Therefore, in 2017, the decreasing order of the macroregions based on the average quantity of wine purchased by a household per year was the following one: M3, M2, M1 and M4 (Fig.14).

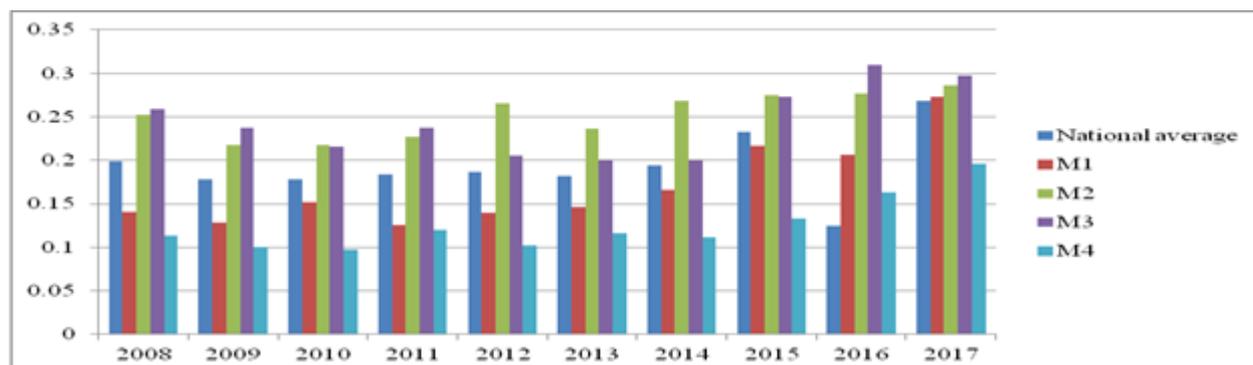


Fig. 14. Average annual amount of wine purchased per household in Romania by macroregion (liters per household/ year)

Source: Own design based on the data from [13].

Romanians are wine drinkers and prefer mainly white and red wine, and less rose wines. There are many occasions when wine is consumed such as: celebrations of birthdays, weddings, marriages, visits, holidays etc and the Orthodox calendar is full of Saints so that the ones wearing a saint first name have an occasion to celebrate and offer wines and other alcoholic drinks to their guests.

White wines are the most preferred by Romanians at the formal events, while red wines are consumed mainly in the family and in the couple.

Concerning consumers' preference for wine depending on its origin, most of the Romanians prefer to buy and drink Romanian wines (75%), 21 % prefer to buy wines imported mainly from the EU and 4 % prefer wines to purchase extra EU wines. Women prefer in general imported wines from France, Italy and Spain, while men prefer especially Romanian wines [33].

Also, wine comes on the 6th position among the Romanian food products which represents 75 % of total food purchasing after eggs (88%), poultry meat (84%), bread (84%), pork (83 %) and meat preparations (82 %).

Regarding consumer preferences for various types of wines, it was found that about 58 % Romanians prefer dry wines, 40 % semidry or semisweet wines and only 2 % prefer sweet wines [26].

In general, Romanians accept to pay between Lei 18 and Lei 35 for a wine bottle purchased from a supermarket or a specialized shop. But, in special occasions, when it is about wine bottle as a gift, they are tempted to pay more.

Taking into account the wine brand in relationship with the grape variety, the recent studies made on samples of consumers proved that many people do not know exactly what brand and type of wine to buy. However, the most known wine varieties are "Grasa de Cotnari" and "Feteasca Alba" which are in the top of the preference and consumption. Also, the top vineyards which are known by consumers are Cotnari, Murfatlar and Odobesti [33].

Important relationships between wine consumption, production, export and import.

Between these indicators: production, consumption, export and import is a close

relationship and reflects in what measure a country is able to cover consumption needs by production, in what measure is able to export from the internal wine production, in what measure wine demand/offer ratio is balances, in what measure import is needed to cover the requirements of the domestic market.

Consumption/Production ratio in Romania reflects that in the period 2007-2017, consumption level was higher than production, in other words, wine production was not able to cover wine demand, and imports were justified to complete and diversify the wine offer. The only years when consumption was almost equal to production were 2009 and 2010, which reflected the impact of the economic crisis on consumption and the year 2013. In all the other years, consumption imposed to complete production by import.

The same ratio at the world level reflects that in the analyzed period wine consumption is smaller than production, therefore it remains an amount of wine for stocks and other purposes (spirits etc) (Fig.15).

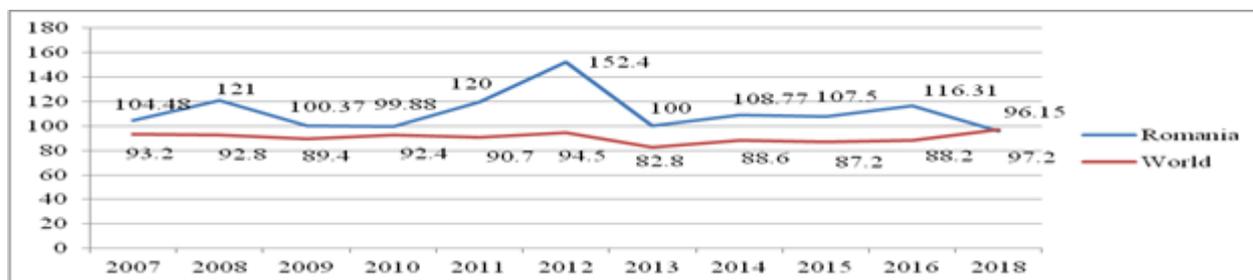


Fig. 15. Wine Consumption/Production ratio in Romania and at the world level, 2007-2017 (%)
 Source: Own design.

Export/Consumption ratio is very small in Romania as the country is not among the top wine exporting states in the EU and in the world.

In 2017, the wine export volume of Romania was 1.47 million hl, representing 1.36 % of the world export. Therefore its exports are pale and non significant compared to the ones of Spain (21.4), Italy (19.8%), France (13.7), Chile (9%), Australia (7.2%), South Africa (4.1%), Germany (3.5%), USA (3%), Portugal (2.7%), New Zealand (2.3%) and Argentina (2

%) which are the top exporting countries [21,22, 25, 27].

However, the export/consumption ratio registered an increasing trend from 2.58 % in the year 2007 to 3.58 % in the year 2017. These figures reflect that consumption is based on a small proportions on imported wines, as production is almost enough to cover the internal market requirements.

At the world level, the situation is completely different. The evolution of the export/consumption ratio is continuously increasing.

From 35 % in 2007 in 2017 it accounted for 44.2 % reflecting that wine is more and more consumed out of its producing countries.

Therefore, more than one third of the consumed wine has its origin in other countries.

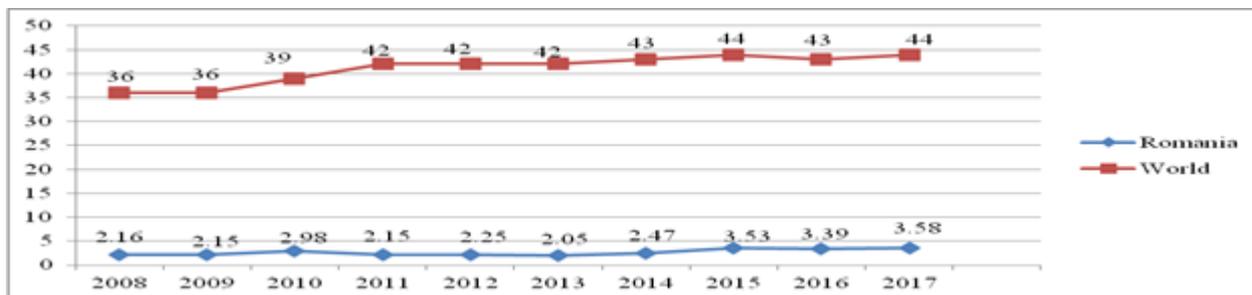


Fig. 16. Wine Export/Consumption ratio in Romania and at the world level, 2007-2017 (%)

Source: Own design.

Self Sufficiency Ratio (SSR) varied from a year to another and in general is lower than 100. This means that, production is not enough to entirely cover consumption. In 2017, the SSR was 92.32 % while in 2007 it

accounted for 95.7 %. The lowest SSR in the analyzed period was 83.35 % in 2011, while the highest ratio was 99.6 % recorded in the year 2009 (Fig.17).



Fig. 17. Dynamics of wine self sufficiency rate in Romania, 2007-2017 (%)

Source: Own design.

Import dependency ratio (IDR) had in general low values in the analyzed period, except a few cases. It reflects that Romania needs to make some imports to complete the domestic offer of wine, but the percentage of imports are enough small. In 2007, the IDR was 6.88 % and in 2017 it was noticed a slight

increase to 10.86 %. However, in the analyzed interval, there were a few peaks: 8.81 % in 2010, 18.7 % in 2011, 14.5 % in 2012 and 12.72 % in 2015. The lowest IDR level was recorded in the year 2009 and accounted for only 2.61 % (Fig.18).

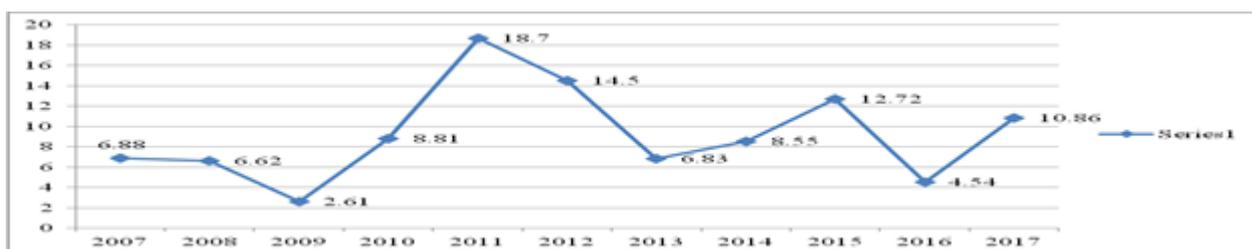


Fig.18. Dynamics of wine import dependency ratio (IDR), Romania, 2007-2017 (%)

Source: Own design.

CONCLUSIONS

Romania has a long tradition in vitiviculture being well known among the well known major producers and consumers in Europe and in the world. its performance is sustained by the favorable soils and climate, hilly slopes orientation to sun, good production potential of vine varieties, investments in new vineyards and wine producing technologies.

Wine production in Romania accounted for 5.2 million hl in 2018 after a long period of up and down variations mainly caused by climate change. For its wine production Romania ranked the 6th in the EU-28 (3.07% market share) and the 13th in the world (1.78% market share) after Italy, France, Spain, USA, Australia, Argentina, China, South Africa, Chile, Germany, Portugal and Russia.

The evolution of wine production in Romania followed the general trend of the world production whose level attained 292 million hl in 2018, a record after the critical level in 2017. The leaders in producing wine are Italy, France and Spain (50 % market share).

Wine production in Romania was positively influenced by the 7.2 % growth of the area under vine which reached 191 thousand ha in 2018, bringing Romania on the 5th position in the EU (5.97 % market share) and the 10th position for 2.5 % of the world surface with vineyards.

At the world level in 2018, there were 7.4 million ha under vine, meaning 3.37 % less than in the first year of the analyzed period, therefore the surface had a general declining trend.

Wine consumption in Romania registered large variations, and a decline after 2013, but since 2017 it recovered and reached 5 million hl in 2018, representing 3.8 % of the EU consumption and the 7th position, and the 12 position in the world for 2 % market share after USA, France, Italy, Germany, China, United Kingdom, Russia, Spain, Argentina, Australia and Portugal.

However, wine remains in competition with beer in Romania in the warm season, but also the preference of consumers for wines of high quality is increasing.

At the world level, wine consumption in relatively stable, after the decline registered in 2014, in 2018 it accounted for 246 million hl a figure similar to the 2007 level. Consumption is high in the main producing countries.

A Romanian consumed about 29.9 liters wine/year in 2018, after a long period of a lower consumption, and this brought Romania on the 8th position in the world. However, Romanians drink 1.5 times less wine than Portuguese, French, Italians, Swiss, Belgians and Australians.

This increasing trend in wine consumption was noticed at the world level as well.

In Romania, wine consumption per capita is higher in the rural areas, in case of the people older than 65, with a lower education level and lower income per household.

The study reflected that the EU-28 is the leader regarding vine growing areas, wine production and consumption, and in export as well having the following market share in the world market: 44.3%, 56 %, 54 % and respectively 74.7 %.

The correlation coefficients, the determination coefficients and regression functions proved that Romania's wine production, cultivated surface with vine and wine consumption have had and continues to have a high and positive influence on the world performance.

Consumption is higher than production in Romania which justify the import of wine to cover the internal market needs, while in the world consumption is below production.

The export/consumption rate in Romania is very low, accounting for 3.58% in 2017 reflecting that a small amount of wine is imported. But, at the world level, the trade internationalisation rate has doubled its level reaching 44 % in 2018, reflecting that of 100 liters of consumed wine, 44 liters were coming from import.

Being below 100, the self sufficiency rate of 92.32 % and the import dependency rate of 10.86 % in 2017 justified the import of wine in Romania, but not in large quantities.

As a final conclusion, as long as wine is an attractive product for consumption, production is expected to continue to grow

and consumption as well in the both in traditional regions and in many other areas of the world and in Romania as well. This will encourage international trade with wines to satisfy better consumers' preferences and increase profit of the main world traders.

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