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Family income from vineyards according to their economic size in selected EU countries

Dochód rodziny z gospodarstw winiarskich w zależności od ich wielkości ekonomicznej w wybranych krajach UE

Mariusz Maciejczak (✉), Tadeusz Filipiak

Warsaw University of Life Sciences – SGGW Nowoursynowska str. 166, 02-787 Warsaw, Poland

✉ Corresponding author: mariusz_maciejczak@sggw.edu.pl

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ABSTRACT

The aim of the research was to determine the family income from the wine farms depending on their economic size in selected EU countries in the years 2004-2016. It was found that the family income of wine farms increased along with the increase of the economic size. The smallest income was obtained from the smallest farms. At the same time, the largest family income was in the largest class of economic size. The largest family income was on Italian and French farms. However, in the analysed periods, the French farms recorded an increase in income, while in Italian it dropped. Comparing the income of families growing vines with the average wage in the national economy it was found that in general it is higher from the third economic size class.

Keywords: economic size, family revenue, wine farms, Europe

ABSTRACT

Badania miały na celu określenie dochodu rodzinnego z gospodarstw winiarskich w zależności od ich wielkości ekonomicznej w wybranych krajach UE w latach 2004- 2016. Stwierdzono, że dochód rodziny z gospodarstw winiarskich w wybranych krajach UE zwiększał się wraz ze wzrostem wielkości ekonomicznej. Zdecydowanie najmniejszy dochód uzyskano w najmniejszych gospodarstwach pod względem wielkości ekonomicznej. Jednocześnie największy dochód rodziny był w największej klasie wielkości ekonomicznej. Największy dochód rodziny odnotowano w gospodarstwach włoskich i francuskich. Jednak gospodarstwa francuskie odnotowały wzrost dochodów, podczas gdy we włoskich spadły. Jeśli porównamy dochód rodzin uprawiających winorośle ze średnią płacą w gospodarce narodowej w wybranych krajach, były one generalnie wyższe od trzeciej klasy wielkości ekonomicznej.

Key words: wielkość ekonomiczna, profit rodziny, winnice, Europa

INTRODUCTION

The wine production is an important branch of the food sector for several Member States of the European Union. As a consequence also in worldwide scale the European Union plays a significant role in the production of wine and through in the area of vineyards and harvest of the grapes (Meloni and Swinnen, 2013).

Many farms specializing in viticulture and wine production are run as family farms. Therefore, it is important that these farms through their income provide economic security for the families. It should be emphasized that the level of income is a crucial issue of the functioning of economic entities, also in agriculture (Sumanth, 1997).

On the one hand, this is the result of the undertaken production activity in the agricultural sector (Sustainable Food Lab, 2017), and on the other, it is the remuneration for the own labor outlays incurred, the resources of land and capital involved (Scoville, 1947).

As highlighted i.a. by Gasson (1973) the mains goals of farmers is to make a satisfactory income and safeguarding it for the future. However Scoville (1947) and also Lowder at al. (2016) argue that at the same time there is a great divergence in the incomes of farmers obtained even in most identical farms. It was proven that no size of farm is large enough to ensure a profit. Therefore, some level of management must be specified in an 'adequate income' concept. Proper size of family farms according to any income concept would vary with changes in prices and costs. As other researches show one of the factors that influence the farm productivity and the income level is the size of the farm (Cary and Holmes, 1982). In Europe the farms specializing in viticulture and wine production are largely diversified with regard to their economic size. A literature review has shown the evidence for the yield differences across farm size (Feder, 1985). The frequent finding is that there is an inverse relationship between farm size and measured productivity (i.e. Adamopoulos, 2011). Small farms are highly productive in terms of output per unit area. According to Cornia (1985) the higher yields observed in small farms are mainly to be ascribed to higher factor inputs and to a more intensive use of land. However, recent evidence casts some doubt on this inverse relationship, which may stem from measurement errors (Adamopoulos and Restuccia, 2014). Even if some small farms produce more per unit of land, their productivity per unit of labor is often very low, and income from these farms remains low, when compared to larger farms (Delord et al., 2015). Thus the inverse relationship should not be taken as evidence that small farms have the potential to lift profitability. Mesut (2013) argues that for farms that are not well situated to benefit from markets for high-value specialty products, increasing income will require either expanding the area of their farms or turning to non-farm income. Townsend et al. (1998) found that most of the wine grape producers operate under constant returns to scale and the inverse relationship between farm size and both land productivity and total factor productivity is weak.

As indicated by Urso et al. (2018) the efficiency of the grapes production depends on many factors from which the quantity and quality of fruits are important along with the market factors that also plays significant role. The research by Urso at al. (2018) shows that the coefficients relating to manufacturing yields and those relating to prices are significant. It was found that in wine production, commercial aspects, in addition to the selling prices of wine, are discriminating elements. Additionally it was stated that in the cost of the production influenced the level of the income of the farmers. There was observed an effect of the economy of the sale. The marginal increase of the production costs resulted in the increase on average higher income of the family of the farmers. However Filipiak and Maciejczak (2018) argued that farms specializing in viticulture in EU countries have very limited developmental abilities. On the basis of the analysis of the income parity it was found that the income from the farm at the parity level does not determine the competitive ability of the farm too. They argue that this is due to the variation and relatively low level of wage labor costs. Therefore the income parity does not guarantee achieving competitive capabilities of European specialist vineyard farms. Also some authors (i.e. Figueiredo and Franco, 2018) suggest that wine cooperatives are a way for small farmers to achieve a scale to sell their grapes and weather to some extent the turbulence of the market, avoiding having to close their operations or the need to negotiate on unfavorable terms with large economic groups.

MATERIALS AND METHODS

The main aim of the research was to determine the selected aspect of the profitability of the vineyard farms in relation to their economic size[1] in selected EU countries. In particular the study determines the level of income of wine farms from the farmer's own work (Family

[1] Under FADN there 6 Economic size class, Class (1) 2 000 - < 8 000 EUR, (2) 8 000 - < 25 000 EUR, (3) 25 000 - < 50 000 EUR, (4) 50 000 - < 100 000 EUR, (5) 100 000 - < 500 000 EUR, (6) >= 500 000 EUR

Farm Net Income on Family Work Unit). According to the FADN methodology the calculation of the Family Farm Net Income is based on the total farm output to which is added the balance of subsidies and taxes and from which are deducted of all farm expenses. In this methodology gradually to the total farm output (which consists of crops output, livestock output and other output) is added the balance of subsidies and taxes arising current productive activity and is also deducted the intermediate consumption, which gives the Gross Farm Income. The Gross Farm Income reduced by the depreciation gives in turn Farm Net Value Added. And if from Farm Net Value Added will be deducted total external factors (including: wages paid, rent paid and interest paid) and will be added the balance of subsidies and taxes on investments (not arising from current productive activity) this will be Family Farm Net Income (Eurostat, 2019).

The study period covered the years 2004-2016. The data from wine farms participating in the European agricultural accounting system FADN[2] were used for the research. The level of agricultural income broken down to Family Work Unit (FWU, it is Annual Work Unit[3] of the family) gave the possibility for comparison with the average net remuneration in the national economy of 14 countries for which data, were collected under the FADN: Austria, Bulgaria, Croatia, Cyprus, Greece, Spain, France, Germany, Portugal, Romania, Slovenia, Hungary and Italy. The Eurostat was used as a source for inflation level. The study used simple methods of descriptive statistics, including the dynamics of changes by applying linear and exponential regression analysis.

RESULTS AND DISCUSSION

The development of farms, including those winegrape growing, is possible when positive effects of the generated production activity are obtained. The basic objective of the functioning of farms is to obtain positive income, which is an economic surplus taking into account the involvement of basic production factors (land, labor and capital). Table 1 presents the net income of the selected EU winegrape growing farms, in classes distinguished in terms of economic size in the period 2004-2016. In the analyzed period, net income per farm increased on average from 23,500 Euro to 34,600 Euro, i.e. by 47.2%. Thus in the analyzed years, an average annual increase in income was observed by 3.5%. In absolute terms, the income of wine farms increased annually by approximately 940 Euro. However, if the inflation is included, farm incomes increased only by 1.5%.

The data presented in Table 1 shows that income of wine farms increased along with the increase in economic size. At the same time, fluctuations in net income were recorded. The coefficient of variation in net income in wine farms in 2004-2016 in the EU countries was 18%. However, the increase in income in the analyzed period was only observed in the fourth economic size group. On wine farms of economic size classes from 1 to 3 there was a decrease in net income per farm. Income of winemaking farms for the class 4 increased from 29,100 Euro to 38,900 Euro, i.e. by 33.7%.

The family income from the wine farm was related to the average wage in the national economy (Figure 1). The family income of wine farms in the EU countries was higher than the average wages in the EU countries by 36.9% for 2004-2006 and 71.2% for the years 2014-2016 The family income of wine farms in the analyzed period increased by approximately 60.2% (comparing the periods 2014-2016 and 2004-2006), while the average remuneration in the EU countries increased by approximately 28%. The family income from a wine farms per Family Work Unit grew from around 20,400 Euro on FWU to approximately 33,600 Euro on FWU, i.e. by 64.7%. The average annual increase in family income was about 4.4%; however, if the inflation will be taken into account, it would increase only by 2.3%.

Additionally there was calculated the income of the family operating on the wine farm compared to the average wage in the national economy in the periods

[2] The Farm Accountancy Data Network (FADN) is an instrument for evaluating the income of agricultural holdings and the impacts of the Common Agricultural Policy

[3] Annual work unit (AWU) in the FADN methodology is the full-time equivalent employment, i.e. the total hours worked divided by the average annual hours worked in full-time jobs in the country. One annual work unit corresponds to the work performed by one person who is occupied on an agricultural holding on a full-time basis

Table 1. Farm Net Income of specialist vineyards depending on the economic size in 2004-2016 (Euro)

Years	Economic size class						Total average
	(1) 2,000 - < 8,000 EUR	(2) 8,000 - < 25,000 EUR	(3) 25,000 - < 50,000 EUR	(4) 50,000 - < 100,000 EUR	(5) 100,000 - < 500,000 EUR	(6) >= 500,000 EUR	
2004	6 183	11 337	20 607	29 116	62 329	154 240	23 459
2005	3 341	9 923	18 815	25 519	59 150	177 987	20 804
2006	3 675	11 600	22 581	29 321	57 764	155 974	21 647
2007	4 403	11 926	23 635	35 241	78 063	175 936	26 019
2008	4 438	12 232	23 073	30 376	66 729	152 006	24 099
2009	1 760	5 858	9 173	16 490	50 748	147 850	17 432
2010	5 624	6 579	11 251	22 507	56 882	256 414	22 064
2011	5 953	7 594	13 259	27 478	68 955	254 469	25 591
2012	4 400	11 084	13 647	27 235	70 969	189 457	28 075
2013	2 986	10 176	13 648	27 245	63 413	204 218	25 865
2014	2 101	9 715	14 357	29 946	73 883	231 521	29 086
2015	4 272	9 658	16 059	30 602	78 252	258 357	32 594
2016	4 225	10 342	17 747	38 941	80 061	250 498	34 605
Absolute change (euro)	-1 958	-995	-2 860	9 825	17 732	96 258	11 146
Average annual change (%)	-1,8%	-1,0%	-3,2%	1,2%	2,0%	4,3%	3,5%
Regression coefficient (euro)	-74,3	-113,4	-596,5	371,3	1 368,8	8 505,2	940,8
Coefficient of variation (%)	31,6%	19,7%	27,0%	18,5%	13,4%	21,1%	18,0%

Source: author's calculations based on FADN data

2004-2006 and 2014-2016[4] in selected EU countries (Figure 2). In general, during the analyzed period, an increase in the income of families of farms engaged in viticulture was observed, as well as an increase in the average remuneration in the national economy of the surveyed countries. Comparing the obtained income of families dealing with viticulture, it can be noticed that much higher income was obtained by producers from the old EU-15 than in the EU-13 countries. At the same time, the largest increases in income of families from wine farms were also in the EU-13 countries than in the EU-15 countries. There was also a greater increase in the income of the family growing vines rather than the average wage. A decrease in family income from wine farms was recorded only for Greek (29.2%) and Austrian (5.7%) farms. In these countries, while the income of families dealing with viticulture decreased, the average wage in the national economy increased. It seems that in these countries, probably growers in the future will withdraw from this activity and look for other sources of income. In the analyzed period, the largest increase in income of families from wine farms was in Hungary (almost 7.5 times), in Romania (about 3.8 times), as well as in Portugal (by 89.3%) and Spain (by 78.6%). In France and Italy, the increase in income of families growing vines in the analyzed period amounted to approximate 57%.

[4] For Bulgaria and Romania, instead of the years 2004-2006, the years 2007-2009, while for Slovenia the years 2005-2007, in the case of Croatia only the years 2014-2016 were available

Figure 1. Family farm net income per Family Work Unit (FWU) of specialist vineyards as compared to Net Earnings in the national economy in the selected EU countries (Source: author's calculations based on FADN data)

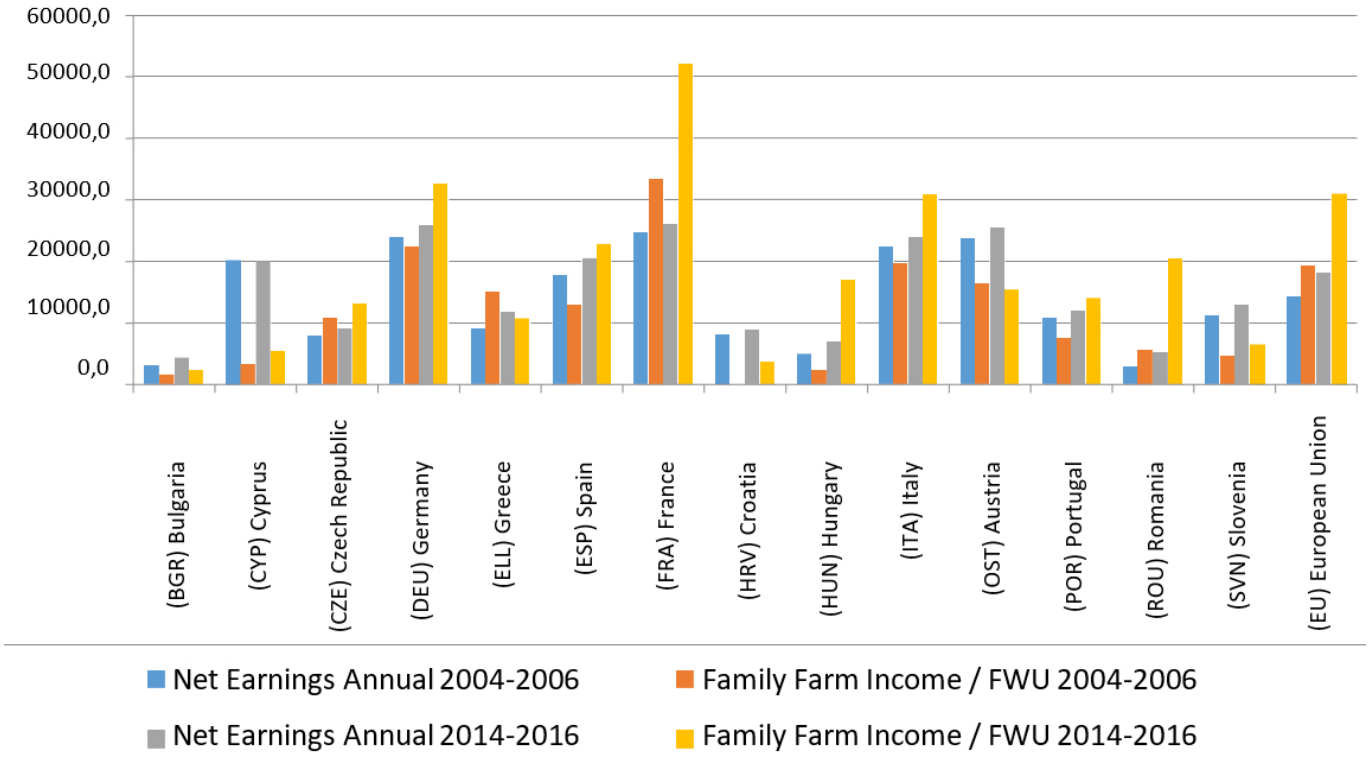

Figure 2. Comparison of Family Farm Income / Family Work Unit (FWU) of specialist vineyards with average wages in the national economy in 2004-2016 (average of years in euro) (Source: author's calculations based on FADN data)

In the analyzed period, there was also a large variation in both the FWU of specialist vineyards as well as a large variation in terms of average wages in the national economies. The coefficient of variation for incomes of families from wine farms amounted to 75.7% for the years 2004-2006 and 74.6% for the years 2014-2016, with a much lower coefficient of variation for the average wage in the national economy 58.1% for the years 2004-2006 and 51.7% for the years 2014-2016. Despite the measures aimed at levelling the level of income in EU countries, there are still large differences not only in the income of families in wine-growing enterprises, but also in the level of average remuneration in the national economy of selected countries. The diversification of the average remuneration in the economy was much lower than the income of families working in wine farms. Average wages in the national economy were higher in the EU-15 countries than in the EU-13. The highest wages were in France (on average around 25,900 Euro in 2014-2016), then in Germany (on average around 25,700 Euro) and in Austria (average 25,400 Euro) and they were more than the average in the EU countries by 43.8% and 42.6% and 41%, respectively. The smallest average wages in the national economy were observed in Bulgaria (on average 23.7% of the average salary in the EU), Romania (28.3%), Hungary (38%) and Croatia (48.5%).

The largest income of the vintner families was in France (approximately 52,100 Euro per year in 2014-2016), then in Germany (32,600 Euro), in Italy (approximately 30,100 Euros), while the smallest in Bulgaria (about 2,300 Euros), Croatia (approximately 3,600 Euro), Cyprus (around 5,400 Euros) and in Slovenia (about 6,600 Euros). Higher income of families growing vines than the average wage in the economy was observed in Romanian farms (almost 4 times for the years 2014- 2016), Hungarian (almost 2.5 times), French (more than twice), Czech (44.2%), Italian (28.5%) and German (26.8%). However, lower family income than average remuneration was recorded in Cypriot farms (only 27% of the average remuneration in 2014-2016), Croatian (around 40.9%), Slovenian (around 50.9%) and Bulgarian (about 52.7%). In the analyzed period, a slight decrease in the average remuneration was recorded only in Cyprus (by 1.5%), with the increase of income of families engaged in viticulture (by 67.9%). However, the incomes of families growing vines were still at a very low level. Agricultural income constituted only 15.8% of the average remuneration in the national economy in 2004-2006 and 27% in 2014- 2016.

The above findings suggest that the probable maintenance of the current production or development will be possible on those farms whose family income significantly exceeds the average remuneration in the national economy. Of course, it depends on many factors dependent and not dependent on farmers, i.e. unemployment rate, distance from the market and jobs, supply and demand for products of the wine sector, including prices, etc.

It was found that the family income of wine farms in selected EU countries increased along with the increase of the economic size (Figure 3). By far the smallest income was obtained on the smallest farms in terms of economic size. In economy class 1 (from 2,000 to 8,000 Euro on FWU), the largest incomes in 2014-2016 were on Portuguese farms (about 9,000 Euro on FWU) and Spanish farms (about 4,200 Euros on FWU). In the last years of research, on the Bulgarian farms there was a loss of wine activity, and the income of the family cultivating the grapevine amounted to – 1,200 Euros on FWU. In the analyzed periods, the deterioration of financial results was recorded in the majority of surveyed countries, except for Portuguese farms (increase in family income almost 3.7 times).

It should be noted that in the class 1 in each of the examined countries, the family income was below the average wage in the national economy. In addition, in this class there was the highest coefficient of variation in family income achieved over 133.5%. In economy class 2 (from 8,000 to 25,000 Euro on FWU), the largest income of families in 2014-2016 was on Spanish farms (about 15,100 thousand Euro on FWU), then on Hungarian farms (around 12,900 Euro on FWU) and Portuguese (about 12,800 Euros for FWU). The smallest income of wine-growing families was definitely in Bulgarian farms

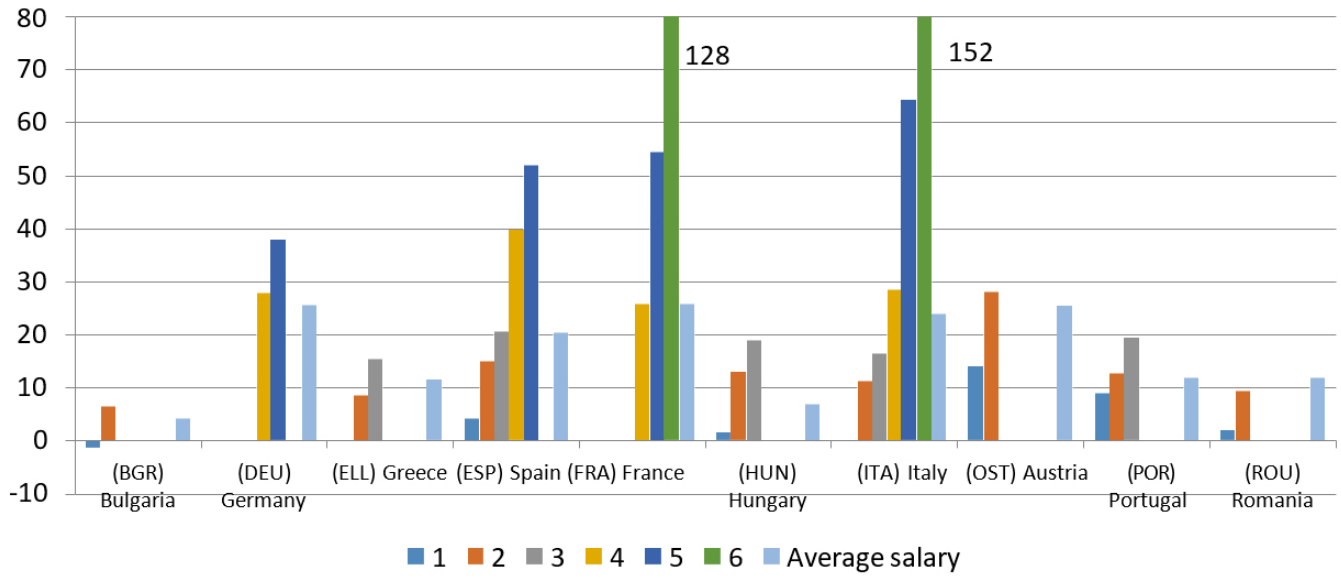

Figure 3. Comparison of Family Farm Income / Family Work Unit (FWU) of specialist vineyards depending on the classes of economic size (1-6) as well as with the average wages in the national economy for selected EU countries in 2004-2016 (average of years in Euro) (Source: author's calculations based on FADN data)

(about 6,400 thousand Euros on FWU). In the analyzed period the income of families growing vines generally increased, with the exception of Greek holdings (by 40.1%). In turn, the largest increase in family income was in Hungarian farms (almost 3.5 times), also in absolute terms (by approximately 9,200 Euros). In this class there was a much lower coefficient of variation than in the previous group, however, it was over 61.8% anyway.

In economy class 3 (from 25 to 50 thousand Euro), the largest income of families in 2014-2016 were in Spanish farms (about 20,000 Euro on FWU), then on Portuguese farms (about 19,500 thousand Euro on FWU) and Hungarian (about 19,000 Euro on FWU). Smaller incomes of wine-growing families were on Greek farms (about 15,400 Euro on FWU) and Italian farms (about 16,500 Euro on FWU). In 2004-2006 and 2014-2016, the increase in income of wine-growing families was on Portuguese farms (by 12.5 thousand Euro on FWU) and Hungarian farms (about 4,000 Euro on FWU). The fall in the income of wine-producing families in this economic class was recorded on Greek farms (by 20.8%, in absolute terms -4 thousand Euro on FWU), Italian (respectively by 19%, and – 3,800 thousand Euro on FWU) and Spanish (by 7.3%, and – 1,600 thousand Euro on FWU).

The coefficient of income volatility for this class was less than in the previous groups (17.9%). In the economy class 4 (from 50,000 to 100,000 Euro), the largest income of families in 2014-2016 was in Spanish farms (about 39,800 thousand Euro on FWU), then on Italian farms (about 28,500 Euro on FWU), German (a 27,900 Euro on FWU) and French (25,900 Euro on FWU). Definitely in this economic class, lower income of families was on Austrian farms (14,100 Euro on FWU). In 2004-2006 and 2014- 2016, the largest increase in income was on French farms (by 58.9%), then on German (54.2%) and Spanish (46.9%) farms. A decrease in family incomes was recorded in Italian (by 11.5%) and Austrian (4.5%) holdings. The highest increase in income of families in absolute terms was in Spanish farms (by 12,700 Euro on FWU). The coefficient of variation in family income in this group was the smallest and amounted to 17.9%.

The next group in terms of income was class 5 (with an economic size of 100,000 to 500,000 Euro). The highest income of families of wine farms in this group in the years 2014-2016 was obtained on Italian farms (64,300 thousand Euro on FWU), then on French farms (54,500 Euro on FWU) and Spanish farms (52,000 Euro on FWU). Definitely lower income of families was obtained on

Austrian wine farms (about 28,100 Euro on FWU) and German farms (37,900 Euro on FWU).

In most countries, an increase in family income was recorded comparing the years 2004- 2006 and 2014-2016, with the exception of Italian holdings (a decrease of 25.7%). The largest increase in the analyzed period was on German (56.1%) and French (40%) farms. In absolute terms, the largest increase in family incomes was recorded on French farms (by 15,600 Euro on FWU). The largest family income was in the 6th - the largest class of economic size (above 500,000 Euro). The largest family income in 2014-2016 was in Italian farms (152,100 thousand Euro on FWU) and French farms (128,300 thousand Euro on FWU). However, comparing the years 2004- 2006 and 2014-2016, French farms recorded an increase in income (by 61.7%), while in Italian it was down (by 52.7%).

If one compares the income of families growing vines with the average wage in the national economy in selected countries, they are generally only from the third economic size class; they are larger, with the exception of Italian farms (Figure 3). In 2014-2016, the average wage in the national economy in Italy was approximately 24,000 Euro, while the income of the family growing vines in class 3 amounted to approximately 16,500 Euro. Due to the low average wage in the national economy in Hungary, already farms of the second economic size achieved higher income from the family growing from vines. In the case of Romanian farms, the income of the first and second-class wine-making families, unfortunately, did not have an average level of remuneration. In the fifth class, the income of farms of farming families was also at a similar level in individual countries. The coefficient of variation was only 18.1% in this group. The largest income was on Italian farms (64,300 Euro on FWU), then French (54,500 Euro on FWU), Spanish (52,000 Euro on FWU), and the lowest income was on German farms (37.9 thousand Euro on FWU). In the sixth class, based on the data, the income of families in Italian holdings in the years 2014-2016 amounted to 152,000 Euro, and on French farms 128,000 Euro on FWU. At the same time, as already mentioned before, comparing the results with the years 2004- 2006, the incomes of Italian farms have decreased and of French farms have increased.

CONCLUSION

On the basis of the conducted analysis it can be stated that the family income from wine farms in selected EU countries increased along with the increase in economic size. The smallest income was obtained on the smallest farms in terms of economic size. At the same time, the largest family income was in the largest class of economic size. The largest family income was on Italian and French farms. However, in the analyzed periods, the French farms recorded an increase in income, while in Italian it dropped. Comparing the income of families growing vines with the average wage in the national economy in selected countries, they are higher, on general, from the third economic size class. This shows that the economic strength of the farms resulting from the economies of scale have an impact on how the wine farms will develop and to which extend will create the favorable conditions to ensure the welfare of the families.

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