

STUDY ON THE EVOLUTION OF THE SIZE OF AGRICULTURAL HOLDINGS IN ROMANIA AND THE U.E. IN THE PERIOD 2007-2018

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Abstract

The article aimed to analyze the evolution of agricultural areas related to agricultural holdings in Romania and EU countries, from the moment of Romania's accession to the European Union until 2018. At the same time, it was aimed to establish the place occupied by Romania in relation to the other member countries, but at the same time compared to the EU average. The study followed not only the classification of agricultural holdings according to agricultural area, but also the eligible areas, as well as the growth rate of agricultural holdings according to the economic size and according to the standard production. The research methodology involved collecting information through databases, processing them and interpreting them using statistical methods, so that by formulating conclusions we can identify not only how farms have evolved over the period, but at the same time identify the causes which were the basis of the existing gaps in Romania compared to the European Union countries.

Key words: agricultural holding, agricultural area, growth rate, economic dimension

INTRODUCTION

The downsizing of agricultural holdings is one of the important problems of research in the field of agricultural policies, but at the same time of farmers and of the deciding factors, considering first of all its orientation towards the market [19]. If initially the concerns were to increase the size of agricultural holdings in order to ensure their profitability, current trends, to practice an agriculture that is not only profitable, but at the same time to protect the environment and human health, bring us new challenges in regarding the finding of appropriate methods for establishing the optimal size of agricultural holdings.

Regarding the use of this concept, at the level of the European Union it is a "professional farm" and refers to a farm that has a large enough area to provide the farmer with the income necessary to meet his needs and his family [3].

Romanian agriculture, as a basic branch of the national economy [23] has undergone substantial changes in the last 30 years in

terms of ownership, land use, etc. which led in a first stage to the fragmentation of the properties. The need to determine the optimal size of agricultural holdings, even if it presents a certain degree of difficulty, especially due to the large number of production factors that determine the results, is equally current, regardless of legislative, economic or social changes.

The size of the agricultural holding is equally important in the choice of technology, of the factors of production [18], but also of the way of using the land [5], of the sustainability indicators of the farm [6], of the sustainability of the production obtained especially in organic farming [22], but also in terms of food security which remains the most important component of global security [7, 20]. All these elements are correlated, as we show even earlier with the need to ensure the profitability of the activity carried out [21]. The world is facing an increase in food demand due to the growth of the world's population, as a result of globalization [2], and climate change is beginning to put increasing pressure on resources, so the need

for food supply will be increasing. bigger. Therefore, the role of agriculture and its efficient practice is an important objective of economic and political interest.

We find, therefore, that the size of an agricultural holding is a complex, necessary indicator, and its calculation presupposes the existence of an important number of information, regarding: surface, livestock, equipment, their degree of load, labor force, results economic, etc.

Therefore, in this paper we intend to analyze this indicator, both in Romania and in the European Union.

MATERIALS AND METHODS

The research methodology involved on the one hand the bibliographic study on the need to determine the optimal size of agricultural holdings, and on the other hand on the collection of existing information in national and international databases on the evolution of the number of agricultural holdings, by categories and classes. of size. The data were processed and analyzed with the help of statistical indicators for the analysis of the evolution of the size of agricultural holdings: simple moving average and annual growth rate.

According to the literature, mobile media is calculated as follows:

$$SMA_1 = \sum p_i(1 \dots n) / n;$$

$$SMA_2 = \sum p_i(2 \dots n+1) / n$$

$$SMA_3 = \sum p_i(3 \dots n+2) / n \quad [1]$$

where:

p_i - the values of the analyzed phenomenon from p_1 at p_n

p_i - the values of the analyzed phenomenon from p_2 at p_{n+1}

p_i - the values of the analyzed phenomenon from p_3 at p_{n+2}

The annual growth rate was calculated according to the formula:

$$\%r = ((\sqrt[n]{\prod p_1/p_0}) - 1) * 100$$

where:

$\prod p_1/p_0$ – represent the indicators of the chained growth; the number of years of the period

The data thus determined were systematized with the help of tables and graphs and were the basis for formulating conclusions regarding the evolution of the number of agricultural holdings, as well as their size.

RESULTS AND DISCUSSIONS

Increasing the size of agricultural holdings in order to increase their profitability has been a permanent concern in the policies of the European Union, which have sought both the concentration of production and the reduction of economic gaps. At the level of the European Union, this process has been hampered by the economic crisis since 2007, when Romania became a member of the union. For Romania, another year of transition was 2009, the year in which a series of economic and social processes ended.

Analyzing the evolution of agricultural areas at the level of agricultural holdings in European Union countries, it is found that the highest growth rate was recorded by Bulgaria (11.07%) which started from an average area of 43.2 ha (2007) and reached 67.9 ha (2018). A growth rate of almost 11% was also recorded in Croatia, a country that in 2018 had an average farm area of 48.5 ha. However, the largest areas are registered by agricultural holdings in Slovakia (445 ha), the Czech Republic (192.2 ha), England (158.6 ha) and Denmark (111.5 ha). Both the Czech Republic and Slovakia recorded declining rates of average areas, even if they had low values (1.32% and 2.44% respectively), while Denmark and England had growth rates of 1.8% and 0.23% respectively.

In Romania, although the trend has been increasing, the growth rate from 2007 to 2018 being 7.25%, it is found that the average area is among the smallest in the European Union. After Romania, there are only countries such as Cyprus (10.7 ha), Slovenia (10.5 ha), Greece (9.6 ha) and Malta (2.6 ha), ie countries that either do not benefit from favorable climatic conditions, or countries where agriculture does not it is one of the basic branches of the economy. There are other countries in which the growth rate had

negative values (Hungary - 1.74%; Slovakia - 2.44%; Portugal - 1.02%).

Table 1. Evolution of the surface/agricultural exploitation in the period 2007-2018

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Annual growth rate
	Ha	ha	ha	ha	ha	ha	ha	Ha	ha	ha	ha	ha	%
Austria	31	31.5	31	30.7	30.7	31.6	32.7	28.6	29	29.1	32.8	33.2	0.63
Belgium	43.2	44.1	48.4	48.4	48.4	50.4	51	51.2	51.2	49.5	50.1	51.9	1.69
Bulgaria	21.4	22.9	34.7	35	35	37.5	37.9	41.9	44.5	44.6	65.9	67.9	11.07
Croatia	15.7	14.4	19.1	16.9	16.9	17	54.4	56.1	49.7	51.5	52.7	48.5	10.78
Cyprus	7.6	8.1	9.3	8.6	8.6	8.3	8.9	11.4	10.3	10.1	9.5	10.7	3.19
Czech Republic	222.5	224.9	224.5	228.8	228.8	199.2	202	201.8	187.8	189.7	193.3	192.2	-1.32
Denmark	91.6	92	93.1	96.5	96.5	96.6	97.9	94.9	103.4	110	111.1	111.5	1.8
England	154.5	150.9	157.8	155.6	155.6	157.3	164.5	163.8	159.6	159.1	153.9	158.6	0.23
Estonia	109.3	112.9	122.4	125.5	125.5	134.1	137	128.7	137.2	134.6	138.7	140	2.28
Finland	51.4	52.2	55.1	54.4	54.4	56.9	57.7	58.4	63.8	64	64.6	67.2	2.47
France	84.7	84.5	87.2	87.7	87.7	86.8	86.4	86.6	89	87.7	87.8	88.1	0.36
Germany	78.4	77.7	85.5	84.8	84.8	87.9	88.9	88.6	89.7	88.7	91.1	91.3	1.39
Greece	7.6	7.5	8.5	9.1	9.1	9.5	9.8	10	9.9	10.4	10	9.6	2.21
Hungary	54.4	56.1	51.5	52.7	52.7	48.5	48.7	49.2	47.2	45.1	44.8	44.8	-1.74
Ireland	45.9	45.9	44.1	43.4	43.4	49.3	49.5	50.1	48	48.2	48.9	48.8	0.55
Italy	14.8	14.8	15.9	15.9	15.9	16.6	17	20.5	20.7	21	21	21.6	3.51
Latvia	68.6	67.7	70.3	71.8	71.8	70.7	69.1	65.1	69	67.7	66.9	66.1	-0.33
Lithuania	43.9	43.5	47.9	46.7	46.7	46.4	48.6	47.5	47.5	49.4	49	49.5	1.09
Luxembourg	76.5	76.3	78.5	78.5	78.5	83.9	82.9	82	84.3	83.1	84.6	85.7	1.03
Malta	3.1	3	2.7	2.6	2.6	2.7	2.7	2.8	2.6	2.7	2.6	2.6	-1.61
Netherlands	34.5	34.7	36.4	36.7	36.7	37.6	36.5	36.9	38.9	38.8	38.3	39.3	1.2
Poland	18.3	19.6	18.5	18.6	18.6	18.7	18.8	18.4	19.1	19.6	19.9	19.6	0.63
Portugal	25.2	25.5	24.6	25.1	25.1	26.5	26.4	26.8	23.5	23.4	22.8	22.5	-1.02
Romania	8.2	8.5	10.3	10.2	10.2	9.3	9.3	9.2	8.8	9.3	9.7	17.7	7.25
Slovakia	584	585.3	508.8	552.9	552.9	474.8	550.9	532	458.7	458.8	430.9	445	-2.44
Slovenia	10.8	10.8	11.4	11.1	11.1	10.9	10.6	9.8	10.2	10	10.1	10.5	-0.32
Spain	36.3	37.3	36	36.5	36.5	40	41	40.9	46.2	46.5	46.7	46.5	2.27
Sweden	90.7	90.4	98.6	98.9	98.9	101.6	102.8	106.8	106.6	106.8	105.1	106.6	1.48
EU Average	29.4	29.9	32.4	32.5	32.5	33	33.1	33.9	34.5	34.7	35.1	39.9	2.81

Source: own processing [4].

The average growth recorded at the level of agricultural holdings in the European Union was 2.81% due to the increase of the average area by about 10 ha during the 12 years analyzed, which is the effect of the agricultural policy measures taken at Union level.

Regarding the eligible agricultural area/agricultural holding in Romania, although there was a continuous growth trend from 2007 to 2018, (the increase from 2018 compared to 2017 being 81%), we find that the average area is still low compared to the average of the European Union, being

between 26% of the average in 2015 and 44% of the average in 2018.

Table 2. Evolution of the eligible agricultural area / agricultural exploitation in the period 2007-2018 in Romania

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
	ha	ha	ha	ha	ha	ha	ha	Ha	ha	ha	ha	ha
EU Average	29.4	29.9	32.3	32.5	32.5	33.0	33.1	33.8	34.5	34.6	35.1	39.8
Romania	8.2	8.5	10.3	10.2	10.2	9.3	9.2	9.2	8.8	9.3	9.7	17.6

Source: own processing [8-17].

At the same time, the standard production of agricultural holdings in Romania, expressed in thousands of Euros, is well below the average registered in the European Union. If in 2007 it was 79% below the union average, by 2018 it had recovered only 3%.

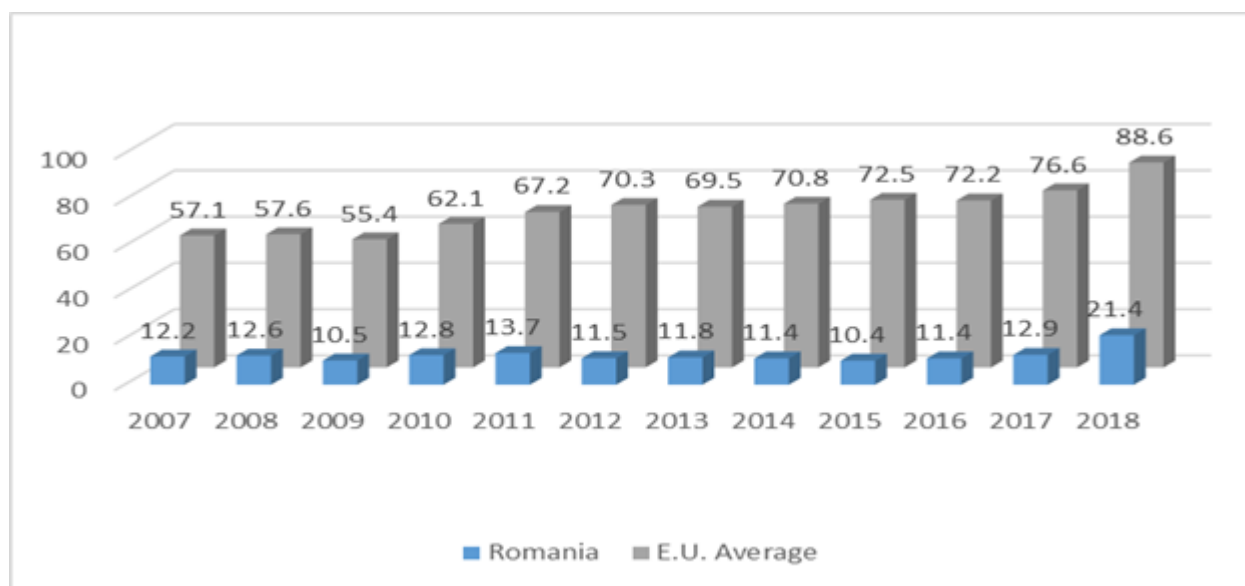


Fig. 1. Situation of standard production in Romania, 2007-2018 (thousand Euro)

Source: own processing [8-17].

Analyzing the growth rate of the size of agricultural holdings in Romania, depending on the size classes (according to the RICA methodology) it is found that only for the interval 2,000 - 8,000 Euro there was an increase of 0.13%, while for all other size classes they have decreased. The most important decrease was 2.13% for the size class between 25,000-50,000 Euro (Table 2, Graph 1).

Table 3. Growth rate of the size of agricultural holdings in Romania, in the period 2007-2018, by size classes (ha)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
2,000 - < 8,000 EUR	5.7	6.0	6.0	5.9	6.1	5.1	5.2	5.1	4.5	4.7	4.8	5.8
8,000 - < 25,000 EUR	15.7	16.2	15.3	15.4	15.5	15.1	15.4	15.4	13.7	13.9	14.3	14.4
25,000 - < 50,000 EUR	35.8	36.4	32.6	33.2	33	30.5	30.7	30.5	28.7	28.4	28.2	28.3
50,000 - < 100,000 EUR	60.2	60	57.5	57.6	57.7	55.4	26.5	56.7	53.5	54	53.6	54.9
100,000 - < 500,000 EUR	105.3	104.5	102.7	103.9	103.9	103.6	104.3	103.6	100.6	100.4	100.8	102.1
= > 500,000 EUR	316.8	326.3	308.5	303.1	305.8	295.7	298.6	295.7	270.8	272.9	271	272.4

Source: own processing [8-17].

On the other hand, large agricultural holdings in the size classes of over 100,000 Euros, respectively 500,000 Euros.

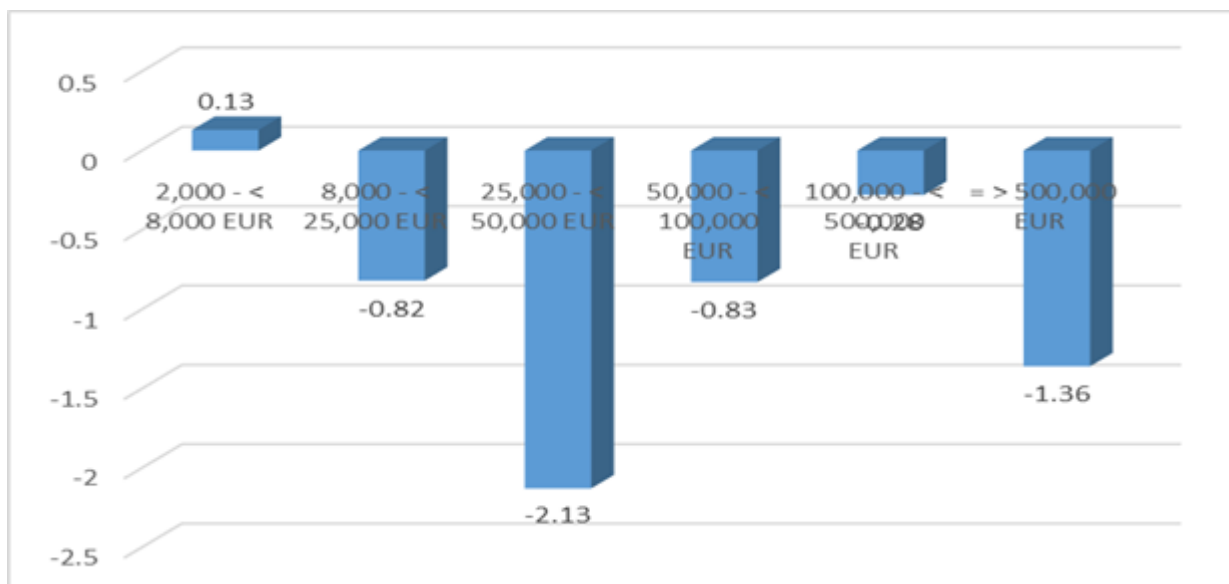


Fig. 2 . Evolution of the Growth Rate of the size of agricultural holdings in Romania, by size classes (2007-2018)
Source: own processing [8-17].

An analysis of the growth rate of the economic size of the agricultural holdings at the EU level emphasizes decreases for all the size classes, except the one of the holdings with incomes ranging between 100,000 – 500,000 Euro which have an increase by 0.71%.

Table 4. Evolution of the growth rate of the economic dimension of agricultural holdings in the European Union (thousand Euro)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
2,000 - < 8,000 EUR	9.0	8.7	6.8	7.7	8.4	7.0	6.8	6.8	5.6	5.7	6.4	6.9
8,000 - < 25,000 EUR	23.2	22.2	17.8	18.7	20.3	18.6	18.8	19.6	18.1	17.4	18.5	18.6
25,000 - < 50,000 EUR	50.3	48.5	38.2	41.6	46.2	44.2	43.8	42.8	39.2	39.1	41.9	41.3
50,000 - < 100,000 EUR	89.6	89.0	72.3	81.5	87.5	83.6	82.2	81.9	75.6	74.0	76.5	79.2
100,000 - < 500,000 EUR	232.2	233.2	195.8	224.6	243.3	238.6	239.0	237.1	214.8	208.7	220.4	227.8
=> 500,000 EUR	1,023.6	1,107.7	932.6	1,029.2	1,117.2	1,133.1	1,138.2	1,109.6	1,013.3	1,037.2	1,075.0	1,106.7

Source: own processing [8-17].

Table 5. Evolution of the growth rate of the economic dimension of agricultural holdings in Romania (thousand Euro)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
2,000 - < 8,000 EUR	6.4	6.6	6.0	7.2	7.6	5.7	5.9	5.6	4.8	5.0	5.9	6.8
8,000 - < 25,000 EUR	29.8	17.8	14.5	17.6	19.6	14.8	15.8	16.7	13.1	14.4	17.1	18.1
25,000 - < 50,000 EUR	131.1	61.2	40.4	52.0	57.2	42.5	42.5	43.8	37.0	41.2	46.5	45.6
50,000 - < 100,000 EUR	141.8	76.1	77.1	101.3	112.5	82.3	91.7	86.3	73.3	84.1	88.3	90.5
100,000 - < 500,000 EUR	360.2	279.4	233.7	298.6	367.7	248.7	259.8	252.7	229.8	248.5	276.3	297.3
=> 500,000 EUR	1,509.8	5,281.3	1,545.5	2,149.6	1,913.8	1,397.3	1,332.3	1,263.0	1,280.2	1,492.7	1,507.3	1,405.2

Source: own processing [8-17].

At the level of agricultural holdings in Romania, the rate of decrease is maintained for all size classes, except for agricultural holdings that register incomes between 2,000 - 8,000 Euro, at which the growth rate is 0.5%, this being an unprecedented situation in other countries of European Union and which is due to the high degree of fragmentation of ownership, the level of capitalization or training of owners.

It is observed that the size of agricultural holdings is determined both by the factors of production and by the standard production. For large farms, which although not numerous in weight, it is specific that they employ a significant amount of agricultural resources, generating important production in terms of quantity and at the same time high income.

On the one hand, small farms specific to countries with a fragmented structure are beneficial to the development of sustainable agriculture, social agriculture being part of the objectives of rural cohesion policies.

CONCLUSIONS

The direction of development of agricultural structures of the European Union are the result of measures established by the Common Agricultural Policy, but also of national regulations that have contributed over time to changes in farm structure and land use, with direct effect on farm size.

The present study shows that the increase in the average size of agricultural holdings in the European Union has been influenced by the measures taken at the time of the transition from granting direct area payments to coupled direct payments. This justifies our assertion that structural effects are important elements in influencing the size of agricultural holdings, and that these effects also depend on the national particularities of the Member States, as the analysis shows.

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