

## ASPECTS THAT CONTRIBUTED TO CHANGES IN THE PRICE OF AGRICULTURAL LAND IN ROMANIA AND OTHER COUNTRIES IN THE EUROPEAN UNION

Dalila Gabriela STOICA, Eduard Alexandru DUMITRU

Research Institute for the Economy of Agriculture and Rural Development, 61 Marasti Blvd., District 1, 011464, Bucharest, Romania, Phone: +4021.313.60.87, Fax: + 021.313.60.96, Emails: stoica.gabriela@iceadr.ro, dumitru.eduard@iceadr.ro

*Corresponding author:* stoica.gabriela@iceadr.ro

### Abstract

*This paper presents the comparison between Romania in relation to countries such as Poland, Italy, Germany, Hungary and Bulgaria, taking into account the similarities between them in terms of selling price of agricultural land, size of countries and agricultural area used. Current differences observed between the sale price of land in Romania, clearly express that there are various problems of agricultural activity in Romania. At the end of the paper, a model was created to see if there is a statistically significant linear relationship between the price of land the number of farms and the subsidy offered per hectare. The purpose of this paper is to identify and verify the correlation between the increase in selling prices of agricultural land, the number of farms and the single payment scheme per hectare. Germany ranks first among countries in terms of agricultural area, holding approximately 16.67 million hectares in 2020, with a negative growth rate of 0.04% while the only country with a positive growth rate is Italy, 0.47%, with a total agricultural area of 13.15 million hectares in 2019. In Romania, the price of one hectare of land is 5,339 euros and it is expected that the prices of agricultural land will increase in the coming years. Rising farmland prices can have a positive impact due to the European Union's financial support for the agricultural sector and agricultural activities.*

**Key words:** land price, agricultural area, agricultural land, Romania

### INTRODUCTION

Romania is the country with the largest number of agricultural holdings among the 6 countries selected and analyzed in this study: Poland, Italy, Germany, Hungary, Bulgaria and Romania. But, compared to the other five countries, Romania has the lowest price offered per hectare of agricultural land.

The position of Romanian agriculture today is largely influenced by the agricultural structure of the country, this being one of the most important problems facing Romania.

From a demographic point of view, Romania's population represents approximately 4% of the EU-28 population, with a total country size of 238,397 km<sup>2</sup>. In terms of agricultural area used, Romania is among the main EU countries, owning approximately 13.83 million hectares representing 60.7% of the country's area, while Germany has 16.67 million hectares, Italy 13.15 million hectares

and Poland about 15 million hectares (48.2% of the country's area).

There are numerous studies that address the issue of agricultural land and their prices. For example, Virgilijus Rutkauskas, in his paper entitled "Explaining changes in agricultural land prices - a study of Lithuania" argues that the factors that contribute to changes in agricultural land prices are mainly divided into two categories: income from land use and alternatives their use [9]. Regarding the income obtained from land use, he claims that "the price is determined by the value of economic goods created by working the land itself." The same study argues that the current value of agricultural land should take into account several factors such as: characteristics of agricultural land, fertility, predominant agricultural structures, such as small farms or farms, distance between land and populated areas, etc [4, 10].

Alden Wily in his book "Collective Land Ownership in the 21st Century: An Overview

of Global Trends" noted that unlike real agricultural land use, land ownership is a social element. He argues that "land ownership is significant for both state-building and economic development" [1].

In this context, the purpose of the study was to present a comparative analysis of the main indicators in Romania, Poland, Italy, Bulgaria, Germany and Hungary, including the link between the price of land and the number of holdings as well as the link between the price of land and the subsidy per hectare.

## MATERIALS AND METHODS

In order to carry out the research, the selected countries were chosen for their similarities in terms of size, population, agricultural area, but also climatic conditions, relief, etc.

The indicators presented and analyzed in the research refer to the agricultural area of the countries, the selling prices of agricultural lands, both at the level of the development regions in Romania and at the level of the 6 countries and the presentation of the number of farms.

It is also noted that the analysis of the above-mentioned indicators was carried out for the period 2011-2019, and the latest data provided by Eurostat and the Structural Survey on Agriculture were used to analyze the number of holdings. At the end of the paper, a Pearson correlation model was made to show the connection between the variables. The

correlation analysis involves measuring the intensity of the connection between the two numerical variables presented, as well as testing their significance, using SPSS program.

The correlation coefficient is calculated using the relation:

$$r = M \left( \frac{x-a}{\sigma_x} \times \frac{y-b}{\sigma_y} \right),$$

where:

-M is the operator of the mean value,

-a = Mx and b = My are the centers of the distributions of the variables x and y, and

-  $\sigma_x$  and  $\sigma_y$  are the corresponding standard deviations.

The values recorded by the correlation coefficient "r" are between +1 and -1. If r = 0 there is a zero correlation.

## RESULTS AND DISCUSSIONS

Romania, Italy, Germany and Poland are countries that have significant agricultural land in terms of size.

According to Table 1, Germany ranks first among countries in terms of agricultural area, holding approximately 16.67 million hectares in 2020, with a negative growth rate of 0.04%. The only country with a positive growth rate is Italy, 0.47%, with a total agricultural area of 13.15 million hectares in 2019, representing about 47.1% of the total area of the country (Table 1).

Table 1. Agricultural area used by the selected EU countries during 2011-2019 (million ha)

Country	2011	2012	2013	2014	2015	2016	2017	2018	2019	Growth rate (%) *
Germany	16.72	16.67	16.70	16.72	16.73	16.66	16.69	16.65	16.67	-0.04
Poland	14.78	14.53	14.41	14.42	14.40	14.41	14.50	14.54	14.55	-0.20
Romania	13.98	13.73	13.90	13.83	13.86	13.52	13.38	13.41	13.83	-0.14
Italy	12.67	12.55	12.43	12.72	12.66	12.84	13.01	12.91	13.15	0.47
Hungary	5.34	5.34	5.34	5.35	5.35	5.35	5.35	5.34	5.31	-0.07
Bulgaria	5.09	5.12	5.00	4.98	5.01	5.02	5.03	5.03	5.04	-0.12

Source: Eurostat, Accessed on 12.04.2021, \* own calculations.

Regarding the development regions within Romania, the highest prices are registered in Bucharest-Ilfov and South-West Oltenia (Table 2). A higher concentration of outlets as well as their importance in the process of marketing agricultural and food products

contributes to higher competition in demand for agricultural land in the Bucharest-Ilfov region, and consequently, the existence of above average land prices. Higher prices for agricultural land are also recorded in the southern and south-western regions of the

country, mainly due to the high agricultural potential and fertile areas favorable to agriculture.

The price of land can be influenced by factors such as the region in which it is located, the quality of land, agricultural production prices and a number of national rules (laws), regional rules (climate, proximity to sales centers) and the relationship between supply

and demand and so on an important role in determining the prices of agricultural land is also played by the degree of their merging, so that the more compact the area, the higher the selling price. A fair price contributes to the development of agriculture as well as to the improvement of transactions in the land market [6].

Table 2. Evoluția prețurilor terenurilor agricole în funcție de regiunea de dezvoltare în România (euro/ha)

Region	2011	2012	2013	2014	2015	2016	2017	2018	2019	Growth rate (%) *
TOTAL	1,366	1,666	1,653	2,423	2,039	1,958	2,085	4,914	5,339	18.58
North-West	1,085	1,572	1,234	2,292	2,046	1,906	2,022	4,181	4,921	20.80
Center	997	1,131	1,731	-	2,026	1,870	2,256	5,051	6,895	34.46
North-East	1,190	1,331	-	1,888	2,083	2,033	1,961	3,849	4,036	15.64
South East	1,387	1,776	1,518	2,929	1,999	1,863	2,028	5484	5448	18.65
South - Muntenia	1,347	1,345	1,791	2,111	2,048	2,059	2,227	4688	5833	20.11
Bucharest - Ilfov	1,415	466	1,577	1,781	1,783	1,999	1,958	7378	7394	22.96
Southwest Oltenia	1,240	1,270	1,936	2,205	2,007	1,966	2227	5730	5591	20.71

Source: eurostat.eu, accessed on 12.04.2021 [7], \* own calculations.

A forecast of land prices for the next three-year period, 2020-2022, was made based on data provided by Eurostat (2010-2019), using the forecasting function in SPSS.

It is expected that the prices of agricultural land will continue to increase in the coming years, according to Figure 1, reaching in 2022 that one hectare of agricultural land will be sold with a maximum of 8,900 euros (Fig.1).

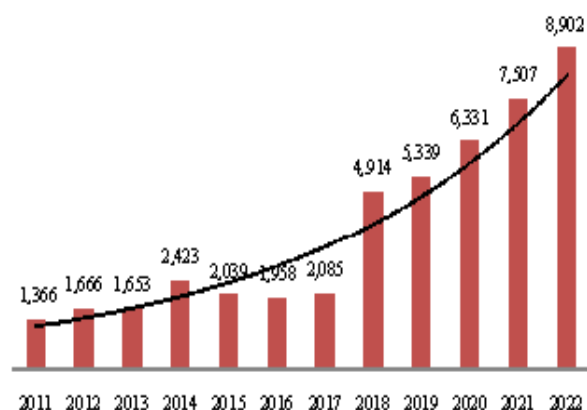


Fig. 1. The evolution of the land price in Romania, including the estimation until 2022 (euro/ha)

Source: own processing.

Figure 2 shows the evolution of agricultural land prices in the countries presented, Romania, Hungary, Bulgaria, Poland and Italy, in the period 2011-2019, where it is found that there were increases for the price of agricultural land. (Fig. 2).

The differences between the selling prices of land in Italy and the selling prices of land, in other countries can be attributed to the fact that Italy has been part of the European Union since 1958, benefiting from the financing of the agricultural sector long before Romania, Bulgaria, Poland and Hungary.

In other words, after Romania joined the European Union in 2007, the interest for investments in agriculture increased, due to the funds granted by the European Union for a development and improvement of farms, producer groups, for the development of irrigation system, afforestation, etc., thus increasing and the interest in cultivating the land, and implicitly, the price of agricultural land.

Italy is the only country with a negative annual growth rate, 0,4%, while for the other countries, the growth rate has positive values.

The selling price of agricultural land in Romania increased on average by 18.58% euro/ha, reaching in 2019 that one hectare of agricultural land be sold, on average by 5,339 euro, according to data provided by Eurostat.

This was the strongest increase in land prices in 2011-2019 among the countries analyzed. 8 years ago, a hectare of land could be bought on average for only 1,366 euros (Table 3).

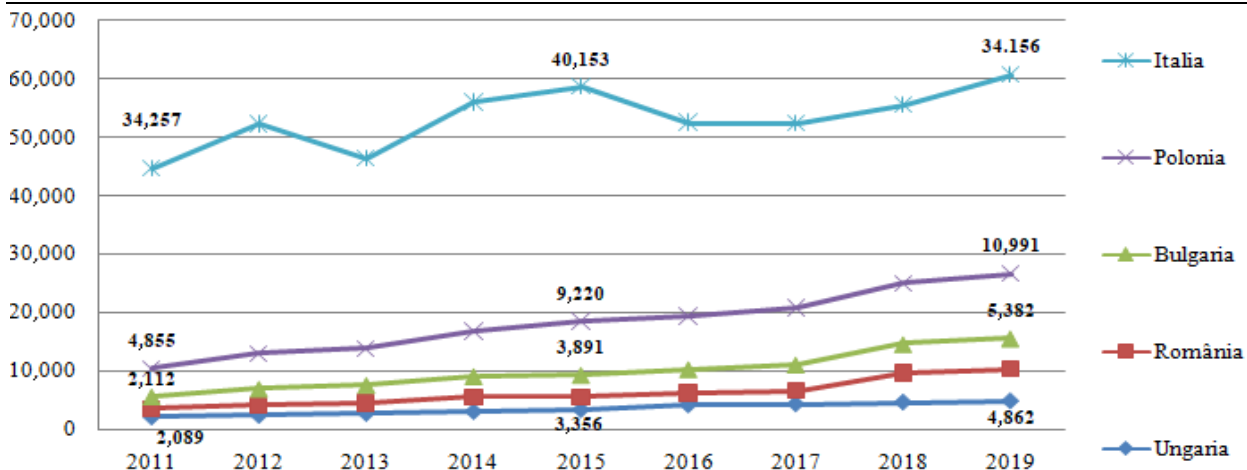


Fig. 2. Evolution of agricultural land prices in the selected EU countries (euro/ha)  
 Source: Eurostat.eu [7], accessed on 12.04.2021

Table 3. Evolution of agricultural land prices by selected country (euro/ha)

Country	2011	2012	2013	2014	2015	2016	2017	2018	2019	Growth rate (%) *
Hungary	2,089	2,380	2,709	3,042	3,356	4,182	4,368	4,662	4,862	11.14
Romania	1,366	1,666	1,653	2,423	2,039	1,958	2,085	4,914	5,339	18.58
Bulgaria	2,112	2,843	3,175	3,620	3,891	4,131	4,622	5,011	5,382	12.40
Poland	4,855	6,080	6,275	7,723	9,220	9,083	9,699	10,414	10,991	10.75
Italy	34,257	39,342	32,532	39,247	40,153	33,193	31,731	30,569	34,156	-0.04

Source: Eurostat.eu [7], accessed on 12.04.2021, \* own calculations.

Romania is characterized by small farms, respectively by a very small average farm area.

According to the data provided by Eurostat, in 2016 (the most recent data), the farms in Romania were the smallest in terms of farm size, among the 6 countries analyzed (Fig. 3).

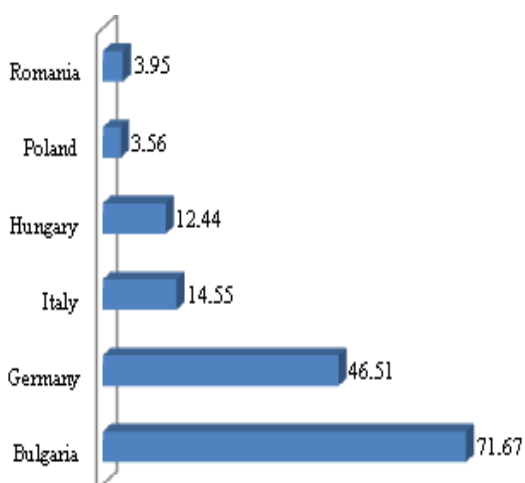


Fig. 3. The average size of farms in 2016 (ha)  
 Source: Eurostat data processed [7], accessed on 12.04.2021.

The reason why Romania has an average farm area well below Germany or Bulgaria, is due to the lack of the process of collectivization

and land consolidation, which was not as complete as in other European countries [3, 10]. The process of concentration and merging of farms is a natural one, in close connection with the development and emergence of new, more efficient agricultural technologies.

With the emergence of high-performance production systems, which predominate in highly industrialized countries, there was the disappearance of small farms that could not expand, therefore, Romania is still dominated by small farms [5, 8].

Regarding the number of holdings in the analyzed countries, it is observed that Romania has the largest number of agricultural holdings (3.4 million) followed by Poland and Italy with a comparatively smaller number (1.4 million holdings respectively 1.1 million agricultural holdings), although the agricultural area used of these is higher compared to the agricultural area used in Romania (approximately 13 million hectares) (Fig. 4).

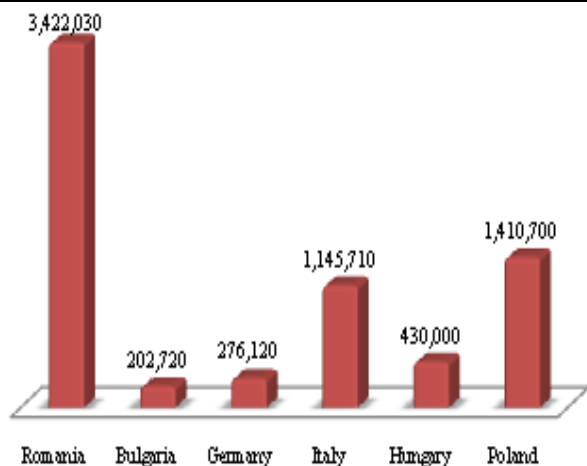


Fig. 4. Number of agricultural holdings in several European countries \* (number)

\* the latest data according to the Structural Survey in Agriculture 2016.

Source: Eurostat.eu [7], accessed on 12.04.2021.

Analyzing the link between the dependent variable "land price" and the independent variable "number of holdings" shows a close link. The value of the Pearson coefficient is – 0.791, which indicates an inversely proportional link, meaning that while the price of land has a rising trend, the number of farms tends to decrease (Table 4).

Table 4. Determining of the Pearson correlation coefficient between the land price and the number of farms

		Number of Holdings
The price of land	PearsonCorrelation	-.791*
	Sig. (2-tailed)	0.001
	N	9
*Correlation is significant at the 0.05 level (2-tailed).		

Source: own representation in SPSS, 2021.

In Romania, the price of land shows an upward trend due to the tendency to consolidate them and the sector as well as due to the fertility and quality of land in Romania. However, the structure of agricultural land use in the country has not changed significantly in recent times, so there is the same degree of land fragmentation. The number of farms showed a continuous decrease, which clearly indicates the decrease in interest in practicing this type of activity, and the persistence of subsistence and semi-subsistence farming [2]. Therefore, the upward trend of prices

correlated with the downward trend of farms highlights the fact that there is a problematic situation faced especially by Romanian agriculture.

From a statistical point of view, the correlation between the dependent variable, the "land price" and the independent variable "single area payment scheme" is not valid, so the significance of the 2-tails test is above the 0.05 threshold (Table 5).

Table 5. Determination of the correlation coefficient between the land price and the single area payment scheme

		Single area payment scheme
The price of land	Pearson Correlation	-.134
	Sig. (2-tailed)	.731
	N	9

Source: own representation in SPSS, 2021.

## CONCLUSIONS

Agricultural land prices in Romania are significantly lower than those recorded in Italy, Germany, Poland and even Bulgaria, but have increased in recent years due to the presence of several factors.

The price of one hectare of agricultural land came to be sold in 2019 with an average price of 5,339 euro, a high price for Romania, but much lower compared to the sale prices of land recorded by other EU countries.

However, it is expected that in the next period the same growth trend will be maintained, reaching in 2022 that the price of one hectare of land will be about 9,000 euro.

Rising farmland prices can have a positive impact due to the European Union's financial support for the agricultural sector and agricultural activities.

However, the link between the increase in sales prices of agricultural land and the number of holdings was established, so that the Person correlation coefficient indicated a close, inversely proportional link.

It should be noted and noted the trend of rising land prices at the same time as the decrease in the number of farms that highlights the poor situation in agriculture in Romania.

There is no link between the selling price of agricultural land and the single area payment scheme, as the sigma significance threshold exceeds 0.05.

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