

INCENTIVES FOR AGRICULTURAL HOLDINGS IN ACCESSING INVESTMENT FUNDS FOR THEIR MODERNISATION THROUGH CAP MEASURES

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Abstract

The investment support for the modernisation of agricultural holdings is an essential type of agricultural support in rural communities. This support could be accessed depending on many agronomic and socio-economic criteria. This article aims to observe whether the attractiveness in accessing the projects can be influenced by the size of the agricultural holdings and the level of direct payments received by development regions. It is also desired to see if access to these projects is sustained by the presence of agricultural income needs in the respective regions. By evaluating the data available on the Eurostat platform, we have assessed the number and average size of agricultural holdings in Romania at the level of NUTS 2 regions. In addition, with the help of the Farm Accountancy Data Network database, we have analysed the level of direct payment subsidies per farm. The results of this paper can provide relevant information on the current income needs of the analysed region. This can help us determine if, together with the number and size of the farms, it can influence the access to investment support projects through rural development measures.

Key words: investment support, direct payments, Common Agricultural Policy, support measures

INTRODUCTION

The potential of the development and modernisation of the agricultural holdings can be reflected by the income of those respective farms, the level of the income being among the most important economic categories in agriculture [1].

In European Union (EU) Member States (MS), the agricultural holdings, consequently their income, are supported by a wide range of agricultural interventions in order to ensure their sustainability, efficiency and development, as a condition for maintaining a competitive edge in the market [7]. And this is compulsory as EU agriculture is dominated by small farms which have an important economic role [11]. In the new programming period 2021-2027, according to the European Green Deal and Farm to Fork strategies, new objectives are added for the farms investments: ensuring food security and high-quality food, simultaneously with a significant reduction in inputs.

The investment support for the modernisation of agricultural holdings is one of those interventions mentioned above. This is an aid that could be accessed by the agricultural holdings voluntarily, being an essential type of agricultural support intervention, especially in countries where farms are affected by structural problems. [3] have clearly shown that high-performance agriculture can only be realised within modern agricultural holdings, endowed with modern and efficient equipment.

Due to its accession to the EU in 2007, Romania has experienced great opportunities to modernise its agriculture and agricultural holdings, as it has gained access to the vast range of instruments under the Common Agricultural Policy (CAP).

From data provided by the National Agency for Financing Rural Investments (AFIR), in the last two multiannual financial frameworks, Romania attracted EUR 745 million in 2007-2013, respectively EUR 967 million in 2014-2020 (data available only up

to 2018) for the modernisation of its farms [9].

The region that accessed the largest volume of funding in both periods is the South-East Region [1]. The amounts attracted by this development region are the largest also in terms of the amount per hectare, being approximately EUR 80 in 2007-2013 and EUR 105 in 2014-2020. Those kinds of interventions could be accessed based on different agronomic and socio-economic criteria, and it could be influenced by the structure of a farm, its size and the level of aid received by Pillar I interventions, given that an increase in the volume of financial resources held by a farmer can improve his access to credits, and thus contributing to technological modernisation [6].

The investments made through rural development programs offered by the measure 121 Modernisation of agricultural holdings, was also analysed taking into account the type of investment and the structure of supported farms [10]. The author concluded that the support received could also be divided depending on the size of the farm in order to balance its distribution between farm groups.

This paper aims to observe whether the attractiveness of accessing the projects can be influenced by the size of the agricultural holdings, the level of direct payments received, as well as other indicators at the level of NUTS 2 regions of Romania.

MATERIALS AND METHODS

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RESULTS AND DISCUSSIONS

At the EU level, the number of agricultural holdings has decreased in recent years.

Thus, in the period 2005-2016, the number of farms in the EU was reduced by about 28%, whereas in Romania.

The country owns about 29% of the number of EU farms, the reduction is made at a slower pace, 19%, during the analysed period as shown in Fig.1.

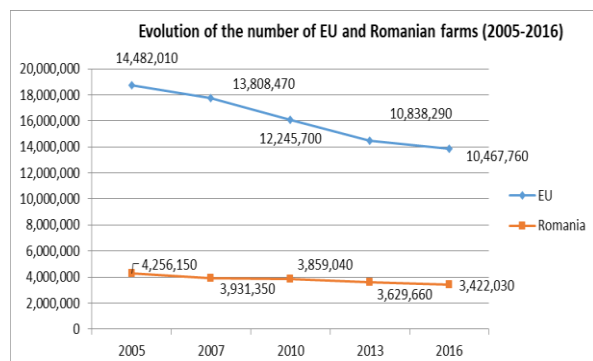


Fig.1. Number of farms in EU 2005-2016
 Source: Eurostat [5].

There are large decreases in the number of agricultural holdings in MS such as Bulgaria, Slovakia (over 60%), and in countries such as Latvia, Poland, Hungary, Lithuania or the Czech Republic.

The only Member State with an increase in the number of agricultural holdings between 2005 and 2016 is Ireland, with the number increasing by 4% compared to the reference year (Table 1).

Table 1. The number of EU farms 2005-2016 (%)

Country	2005	2007	2010	2013	2016
Belgium	100%	93%	83%	73%	72%
Bulgaria	100%	92%	69%	48%	38%
Czechia	100%	93%	54%	62%	63%
Denmark	100%	86%	80%	74%	68%
Germany	100%	95%	77%	73%	71%
Estonia	100%	84%	71%	69%	60%
Ireland	100%	97%	105%	105%	104%
Greece	100%	103%	87%	85%	82%
Spain	100%	97%	92%	89%	88%
France	100%	93%	91%	83%	80%
Croatia	0%	100%	129%	87%	74%
Italy	100%	97%	94%	58%	66%
Cyprus	100%	89%	86%	78%	77%
Latvia	100%	84%	65%	64%	54%
Lithuania	100%	91%	79%	68%	59%
Luxembourg	100%	94%	90%	85%	80%
Hungary	100%	88%	81%	69%	60%
Malta	100%	100%	113%	85%	83%
Netherlands	100%	94%	88%	82%	68%
Austria	100%	97%	88%	82%	78%
Poland	100%	97%	61%	58%	57%
Portugal	100%	85%	94%	82%	80%
Romania	100%	92%	91%	85%	80%
Slovenia	100%	98%	97%	94%	91%
Slovakia	100%	101%	36%	34%	37%
Finland	100%	97%	90%	77%	70%
Sweden	100%	96%	94%	89%	83%
United Kingdom	100%	79%	65%	64%	65%
EU	100%	95%	85%	75%	72%

Source: Eurostat [5].

Table 2. Percentage evolution in the number of Romanian farms by micro-region 2005-2016

Region	2005	2007	2010	2013	2016
North West	100%	90%	89%	85%	81%
Center	100%	90%	90%	81%	75%
North East	100%	94%	93%	88%	84%
South East	100%	94%	87%	81%	77%
South Muntenia	100%	90%	94%	89%	82%
Bucharest-Ilfov	100%	98%	52%	40%	33%
South-West Oltenia	100%	95%	95%	92%	89%
West	100%	90%	86%	78%	72%
Romania	100%	92%	91%	85%	80%

Source: Eurostat [5].

As the number of agricultural holdings falls at a slower pace in Romania than the EU average, the share of Romanian agricultural holdings in the number of EU agricultural holdings increases in the period analysed, representing almost 32% of the total number of agricultural holdings in the EU in 2016.

Regarding the dimension of agricultural holdings by size class in 2016, the high number of small farms is noticeable:

- About 65% of their number is less than 5 ha.
- About 86% of the number of farms is less than 20 ha.

Nevertheless, at the level of the European Union, a share of small farms (less than 5ha) higher than the EU average is found, except Cyprus and Malta, which have specific agricultural features, in six Member States: Bulgaria, Greece, Hungary, Portugal, Croatia and Romania. From this, we can conclude that the large share of small farms is not an exclusive characteristic only for the new Member States, having a large number of small farms is also found in older MS such as Greece, Portugal, or even Italy. On the other hand, there are Member States that have a high share of farms larger than 100 ha, such as the Czech Republic, Germany, Denmark, France, Germany, Sweden, or Finland (Table 3).

After Malta, Romania ranks second in the EU, in terms of the percentage of farms smaller than 5 ha (91.78%).

The 2nd position in the EU is also maintained regarding the cumulative share of farms smaller than 20 ha.

Only 1.08% of the Romanian farmers own farms larger than 20 ha (Table 3).

And only 0.36% of the total number of agricultural holdings is above 100 ha. This large share of small farms in Romania requires a more detailed analysis beyond their cataloguing based on the physical size of the farms.

Assessing their role in the economic transformation, taking into account the multiple roles that small farmers play in the economy of local communities, is also necessary. Differentiated policy measures can either increase the dynamism of this sector or

stimulate the integration of this sector with the rest of the economy [11].

Table 3. Size of farms in the EU 2016 (%)

Country	0 to 4.9 ha	5 to 19.9	20 to 49.9	50 to 99.9	> 100
Belgium	13.85%	30.63%	30.22%	18.62%	6.70%
Bulgaria	82.61%	8.46%	4.12%	1.81%	2.99%
Czechia	18.70%	36.37%	17.90%	9.23%	17.75%
Denmark	4.39%	39.29%	20.91%	13.44%	21.91%
Germany	8.56%	36.73%	24.06%	17.37%	13.28%
Estonia	31.56%	37.07%	13.71%	6.29%	11.38%
Ireland	7.39%	36.05%	38.55%	14.44%	3.58%
Greece	77.33%	18.37%	3.42%	0.72%	0.16%
Spain	51.57%	26.75%	10.83%	5.34%	5.50%
France	24.27%	18.16%	16.31%	19.36%	21.89%
Croatia	69.49%	21.98%	4.70%	2.63%	1.20%
Italy	61.93%	26.14%	7.84%	2.61%	1.47%
Cyprus	89.58%	7.70%	1.69%	0.69%	0.34%
Latvia	35.19%	43.53%	12.51%	4.13%	4.65%
Lithuania	50.03%	34.65%	8.15%	3.65%	3.52%
Luxembourg	16.24%	16.75%	15.74%	27.41%	24.37%
Hungary	81.42%	11.07%	3.77%	1.69%	2.04%
Malta	96.53%	3.47%	0.11%	:	:
Netherlands	20.15%	28.68%	29.69%	16.81%	4.72%
Austria	31.02%	37.37%	23.12%	6.43%	2.06%
Poland	54.33%	36.05%	7.17%	1.59%	0.85%
Portugal	71.48%	19.28%	5.02%	1.81%	2.40%
Romania	91.78%	7.14%	0.54%	0.18%	0.36%
Slovenia	59.47%	34.75%	4.91%	0.72%	0.17%
Slovakia	55.69%	23.81%	7.48%	3.66%	9.35%
Finland	4.02%	33.01%	32.99%	19.67%	10.30%
Sweden	10.50%	45.50%	19.29%	11.92%	12.81%
United Kingdom	10.18%	29.33%	21.87%	17.01%	21.60%
EU	65.61%	20.36%	7.09%	3.64%	3.30%

Source: Eurostat [5].

In terms of physical farm size, except the Bucharest Ilfov Region, given its particularities - the small size of the region and the typical structure of the farms given the proximity to the capital-, the South Muntenia Region has the largest shares of small and very small farms (96.4). On the other hand, with the same exception, the South Muntenia Region has the lowest percentages for farms in the categories between 5 and 99.9 ha (Table 4).

Table 4. Size of farms in the Romania 2016 (%)

Region	0 to 4.9 ha	5 to 19.9	20 to 49.9	50 to 99.9	> 100
North West	86.86	11.98	0.69	0.19	0.28
Center	84.70	13.31	1.19	0.37	0.43
North East	94.72	4.52	0.44	0.11	0.22
South East	92.78	5.64	0.61	0.27	0.69
South Muntenia	96.34	2.92	0.28	0.10	0.35
Bucharest-Ilfov	97.00	2.38	0.14	0.10	0.48
South-West Oltenia	93.89	5.55	0.25	0.09	0.22
West	81.91	16.15	0.99	0.34	0.61
Romania	91.78	7.14	0.54	0.18	0.36

Source: Eurostat [5].

In the trend of reducing by 19% the number of agricultural holdings in the period 2005-2016, we have at the end of the period a change in the size structure, in the sense of increasing by about 70 the number of farms > 100 ha but also an increase of very small farms, as such, the growth of large farms was done rather by reducing the of farms between 5-19.9, and not necessarily of very small farms (Table 5).

Table 5. The evolution of the Romanian farms dimension 2005-2016 (%)

Year	Total	0 to 4.9 ha	5 to 19.9	20 to 49.9	50 to 99.9	> 100
2005	100	90.94	8.35	0.38	0.12	0.21
2007	100	89.81	9.41	0.41	0.12	0.25
2010	100	93.13	5.86	0.46	0.19	0.36
2013	100	92.21	6.71	0.52	0.20	0.36
2016	100	91.78	7.14	0.54	0.18	0.36

Source: Eurostat [5].

In terms of average farm size at the EU level, there is a great diversity among the Member States, from 130 ha in the Czech Republic to average sizes below 5 ha in Romania, Cyprus and Malta. The average size of the farm increases during the period analysed in all Member States, but at different rates (Table 6).

Regarding the growth rates of the average size of agricultural holdings, we can discern three groups of countries: (1) countries where there is a growth significantly higher than the average growth rate at the EU level (39.5%), especially in the case of countries from Eastern Europe, such as Bulgaria (331.3%), Slovakia (168.6%), Latvia (109%), but also

Estonia, Hungary, Poland, Lithuania; (2) countries with a growth rate comparable to the EU average: Denmark (42.3%), Germany (38.4%), Finland (37.7%), etc. (3) countries with an average growth rate below the EU average: Romania (12%) and Slovenia (11,1%). Austria and Spain recorded lower growth rates (5.2% and 6.9%, respectively).

Table 6. Average farm size in the EU (ha)

Country	2005	2007	2010	2013	2016
Belgium	26.9	28.6	31.7	34.6	36.7
Bulgaria	5.1	6.2	12.1	18.3	22.0
Czech Republic	84.2	89.3	152.4	133.0	130.2
Denmark	52.4	59.7	64.0	68.4	74.6
Germany	43.7	45.7	55.8	58.6	60.5
Estonia	29.9	38.9	48.0	49.9	59.6
Ireland	31.8	32.3	35.7	35.5	35.5
Greece	4.8	4.7	7.2	6.8	6.6
Spain	23.0	23.8	24.0	24.1	24.6
France	48.6	52.1	53.9	58.7	60.9
Croatia	:	5.4	5.8	10.0	11.6
Italy	7.4	7.6	7.9	12.0	11.0
Cyprus	3.4	3.6	3.0	3.1	3.2
Latvia	13.2	16.5	21.5	23.0	27.6
Lithuania	11.0	11.5	13.7	16.7	19.5
Luxembourg	52.7	56.9	59.6	63.0	66.3
Hungary	6.0	6.8	8.1	9.5	10.9
Malta	0.9	0.9	0.9	1.2	1.2
Netherlands	23.9	24.9	25.9	27.4	32.3
Austria	19.1	19.3	19.2	19.4	20.1
Poland	6.0	6.5	9.6	10.1	10.2
Portugal	11.4	12.6	12.0	13.8	14.1
Romania	3.3	3.5	3.4	3.6	3.7
Slovenia	6.3	6.5	6.5	6.7	7.0
Slovakia	27.4	28.1	77.5	80.7	73.6
Finland	32.6	34.2	35.9	42.0	44.9
Sweden	42.1	43.0	43.1	45.2	47.9
United Kingdom	55.6	72.1	91.2	94.7	90.1
UE	11.9	12.6	14.4	16.1	16.6

Source: Eurostat [5].

Regarding the development regions, there are differences in terms of the average size and growth rate during the analysed period. It should be noted that the West Region, wherein 2005, the largest average size of the farm was registered, also has the highest growth rate in the analysed period, almost

double compared to the national average (20.8%) (Table 7).

Table 7. Average farm size in Romania (ha)

Region	2005	2007	2010	2013	2016
North West	3.3	3.7	3.4	3.6	3.7
Center	4.0	4.4	4.1	4.7	4.6
North East	2.4	2.6	2.5	2.6	2.7
South East	4.0	4.4	4.8	4.8	5.0
South Muntenia	2.7	3.0	2.9	3.0	3.0
Bucharest-Ilfov	2.8	3.0	1.9	3.0	3.1
South-West Oltenia	2.9	2.8	2.8	2.8	2.7
West	5.5	5.9	6.3	6.7	6.9
Romania	3.3	3.5	3.4	3.6	3.7
UE	11.9	12.6	14.4	16.1	16.6

Source: Eurostat [5].

Romania has benefited from different types of European funds since its accession in 2007. This chapter intends to reflect the impact of different indicators, such as the level of subsidies per farm or farm income in the development regions of Romania.

Analysing the distribution of direct payments in the development regions of Romania, they register the highest value per farm in the South East and West regions, the lowest rate being in South-West Oltenia, registering almost 40% less direct payments per farm than the national average (Table 8).

Table 8. Direct payments in Romania 2019 (average by development regions)

Development Regions	UAA (ha/farm)	DP (€/farm)
North East	13.7	3,042
South Muntenia	21.94	4,383
South-West Oltenia	12.2	2,497
North West	13.22	3,265
Center	16.03	4,649
South East	27.89	6,110
West	25.14	6,109
Bucharest-Ilfov	23.68	4,329
Romania	17.7	4,058

Source: FADN [4].

Regarding the utilised agriculture area per farm (using the FADN database based samples), this had increased over the years. In some of the regions, the growth were over the average increase in the country (115.8%). There are higher rates of increase in West (159.4%), North East (151.8%) and South Muntenia (147%) (Fig. 2).

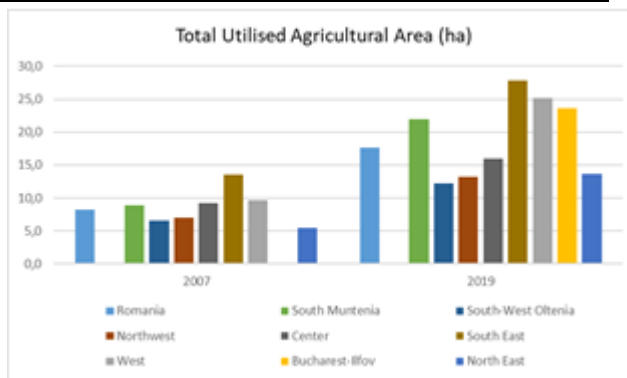


Fig. 2. The Utilised Agriculture Area of a holding (ha) Source: FADN [4].

In terms of farm net value added, between 2007 and 2019, the average percentage increase in Romania was 141.6%. Similar or higher increases are in the North East region (230.5%), South Muntenia (295.7%), South East (334.7%) and West (196.2%) (Fig. 3).

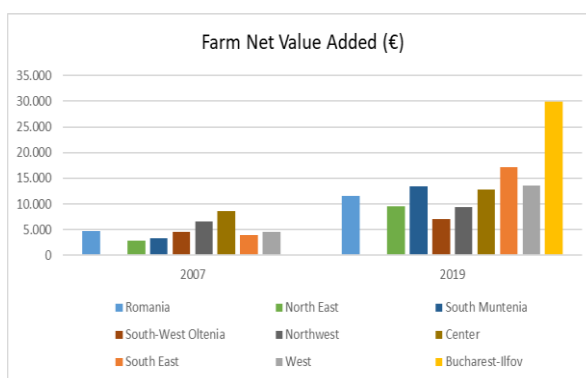


Fig. 3. Farm net value added (€) Source: FADN [4].

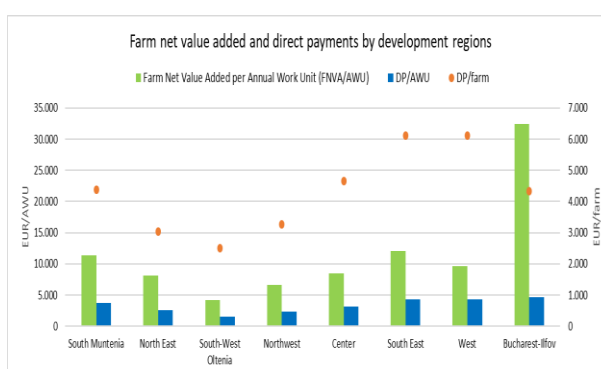


Fig. 4. Farm net value added and direct payments in Romania 2019 Source: FADN [4].

Analysing the farm net value added per annual work unit in relation to the level of direct payments per farm, it is noticeable that a higher level of income from direct payments have a relative importance in farm net value

added [8] but it is not directly correlated to a higher level of the farm net value-added (Fig. 4).

Figure 5 indicates that entrepreneurial farm income (farm net income and wages paid) per annual work unit is not obviously influenced by the level of direct payment per farm. An outstanding example is the West development region, which receives considerably higher direct payments per farm than the South Muntenia region. Nevertheless, the farm income of the later development region is somewhat increased than the West.

Therefore, even though the direct payments are a component of the farm income, it does not substantially impact the farm entrepreneurial income. This indicator (entrepreneurial farm income) could help us overview the development regions that face possible agricultural income needs, despite the level of subsidies received.

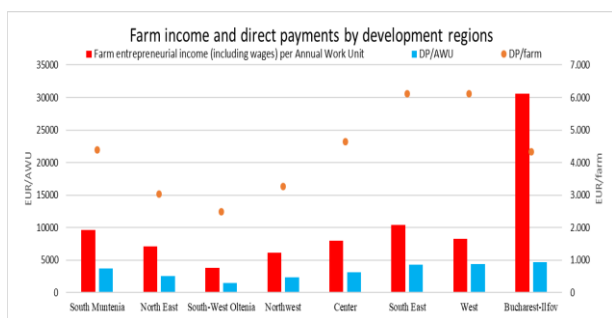


Fig. 5. Farm income and direct payments in Romania 2019
 Source: FADN [5].

Regarding the indicators of total current assets, there is a peculiar shift in the position of the development regions. The most noticeable one is the significant decrease of the total current assets for the Central region by 56%. Three regions (South Muntenia, North East and South East) have undergone a significant spike, increasing their total current assets by 279.8%, 192.4% and 124.7%, respectively. Other regions recorded moderate levels of growth or moderate level of decrease (Fig. 6).

The total fixed assets cover the entire assets of an agricultural holding (land, fixed, etc.). There are visible increases in all the regions, however, the most significant spike is in the South East region, with an increase of over

four times in 2019 compared with the moment when Romania has joined the EU (Fig. 7).

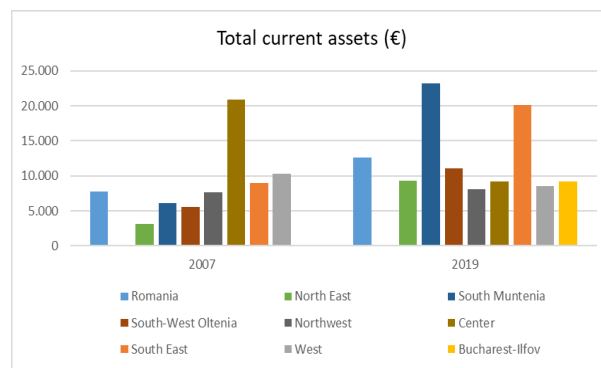


Fig. 6. Total current assets (€)
 Source: FADN [4].

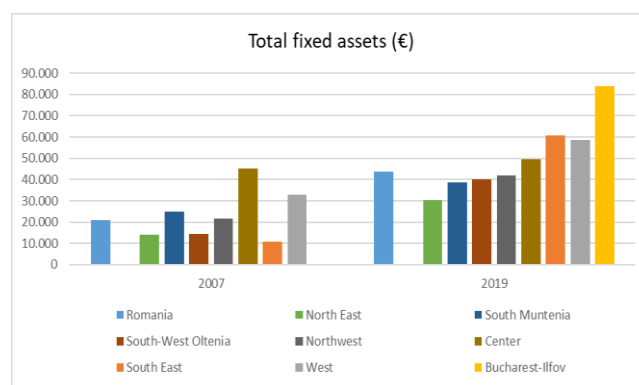


Fig. 7. Total fixed assets (€)
 Source: FADN [4].

As analysed [1] the development regions attracted together over 1.7 billion euros between 2007 and 2020 for the modernisation of the agricultural holdings through Pillar II measures.

The top three regions that attracted the highest amounts during programming periods 2007-2013 and 2014-2020 are South East, South Muntenia and North West (Table 9).

Considering the average farm size, these three regions (South East, South Muntenia and North West) did not mark an ample growth (25% for the South East region and 10% for the others). On the other hand, when it comes to the utilised agricultural area of a holding, South East region has registered the highest growth. South Muntenia also registered a significant growth being in the top three of the regions that featured a high point. Whereas North West was also on the development path, it did not follow the spike of the other regions.

When looking at the net value-added and net value-added per annual work unit of the farms, from the three development regions in the discussion, only South Muntenia and South East noted a significant increase, while North West performed only moderate growth. There is the same situation for the level of entrepreneurial farm income. South Muntenia and South East have a better income level,

and North West seems to have higher agricultural income needs, despite a superior level of direct payments. The same path was indicated in the figure assessing the total current assets. Analysing the total fixed assets, a considerable growth could be seen only in the case of the South East region, the other two being relatively moderate.

Table 9. Contracted amount per NUTS 2 regions in Romania 2007-2020

Development regions	Contracted amount 2007-2013	Contracted amount 2014-2020	Total
Reg. N-E	80,716,422.60	61,289,271.01	142,005,693.61
Reg. S-E	173,328,189.88	227,018,001.78	400,346,191.66
Reg. S	133,708,303.99	154,518,819.88	288,227,123.87
Reg. S-W	47,871,475.96	137,260,528.04	185,132,004.00
Reg. West	90,103,652.14	107,059,035.29	197,162,687.43
Reg. N-W	78,668,093.11	169,128,376.22	247,796,469.33
Reg. Center	75,742,223.38	110,420,613.97	186,162,837.35
Reg. B-IF	65,651,633.20	890,816.53	66,542,449.73

Source: own calculations based on AFIR open data [9].

Going forward and linking the size of the big farms in the three regions with the total amount contracted during the programming periods under discussion, there is no data to indicate a direct link between these two indicators.

Indeed, South East regions have the most significant amount contracted and the highest

number of big farms (2,850 farms over 100 ha), followed shortly by South Muntenia (2,450 farms over 100 ha).

However, on the contrary, the Northwest region has the second-lowest number of big farms (without considering the Bucharest-Ilfov region) but is still in top three regions of contracting amounts between 2007 and 2020.

Table 10. Analysis of the correlation coefficient

Indicators	Contracted amount 2007-2013	Contracted amount 2014-2020
Total number of farms 2007	0.248	
Total number of farms 2016		0.410
Average farm size 2007	0.241	
Average farm size 2016		0.267
Total Utilised Agricultural Area 2007	0.809	
Total Utilised Agricultural Area 2019		0.119
Direct payments/farm 2007	-0.235	
Direct payments/farm 2019		0.245
Farm Net Value Added 2007	-0.362	
Farm Net Value Added 2019		-0.476
Total current assets 2007	-0.056	
Total current assets 2019		0.567
Total fixed assets 2007	-0.255	
Total fixed assets 2019		-0.346

Source: own calculations based on Eurostat and FADN databases using Data Analysis of MS Excel [4].

Analysing the correlation coefficient between the contracted amounts for the modernization of the agricultural holdings (from 2007-2013 and 2014-2020) and the agronomic and socio-economic indicators, at the level of the development regions, a first assessment could be performed (Table 11).

As much as the correlation coefficient is closer to +1 or -1, it indicates a positive (+1) or negative (-1) correlation between the arrays.

A correlation coefficient that is closer to 0 indicates no or weak correlation. A mild correlation has been found between the amounts contracted and the total number of farms and between the average farm size and the total amounts for both 2007 and 2016.

By far, the strongest correlation of the amounts is with the utilised agricultural area per farm in 2007 (0.8, very close to 1), most probably due to the small size of the farms at the time of the accession.

For the economic indicators, a strong correlation could also be seen with the number of total current assets in 2019 (Table 11).

CONCLUSIONS

Over the last years, farm characteristics have been in constant change, both in the EU and Romania.

The investment support for the modernisation of agricultural holdings is an essential type of agricultural support in rural communities.

From accession, the Romanian agricultural holdings started modernising and improving their agronomic and socio-economic indicators.

Given the evidence, a possible mild correlation could be seen between the amounts contracted for the modernisation of the agricultural holdings and the indicators representing the number and the average size of agricultural holdings.

On the other part, it is very difficult to find a link with the economic indicators besides the total current assets of a farm, where there is a mild correlation in the analysed period.

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