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FARM SIZE AND PROFITABILITY - THE VILLAGE AS COLLATERAL FACTOR -

CRISTIAN C. MERCE¹, EMILIAN MERCE², CRISTINA BIANCA POCOL³

Abstract: *The goal of the study is to analyse and compare agrarian structures in several EU countries, analysed separately according to their degree of economic consolidation. The study points out that, in order to characterize the agrarian structures of a country, is not sufficient to determine the average size of farms. Such averages are the result of different distributions of farmland according to size categories, which are valuable sources of analysis in terms of the impact of agricultural structures on the modernization of production processes as well as for achieving substantial economic performance. An important objective of the paper is to evaluate the numerical influence of farm size on the economic results, using regression and correlation methods. The study reveals that size is a necessary condition for the achievement of economic performance, but it is not sufficient. A causalities comparison between countries with a consolidated economic situation and the ones economically precarious confirm this fact, concluding also that, in addition to size, farms must provide a substantial capitalization as well as modern technical equipment. The paper underlines also the fact that the precarious capitalization of farms, along with feudal agrarian structures, causes paradoxal situations, the economic effect being found in an inverse relationship to size.*

Keywords: *farm size, economic effects, causality, paradoxal situations.*

INTRODUCTION

Historical sources confirm that the world has always been divided between the few and the many, between the rich and the poor. In other words, according to Russian terminology between Mensheviks and Bolsheviks.

The two poles constitute a discriminatory ordination of subordination relations, both between individuals and between countries, reality explicitly confirmed by the great personalities of the contemporary world. *“21th century Europeans gave a simple, racist answer to this question. They concluded that they have acquired cultural advantage because they were, undoubtedly, more intelligent, which is why they were intended to conquer, to banish and to kill inferior people. [...] Technological differences thus created led to the greatest tragedies in the last five hundred years, and their inheritance, the inheritance of colonialism and conquest of other nations still have great influence in the world today. [...] All these factors were crucial for whom got colonizer and whom colonized”*(Diamond, 2015).

In the modern world, the colonizer retains the advantages through competition laws and by canceling any protectionist regulation. *“In Western European countries, optimizing organizational framework for land exploitation was made under specific conditions of the market-based economy on competition law”* (Merce *et al.*, 2007).

Such polarization fundamentally influenced also the nature of rural settlements. In countries with a poorly-developed economy, rural settlements are survival subsistence formulas, the household reuniting humans and animals in a mixture reminiscent of the beginnings of human history. In countries with a strong economy, the village developed a different structure, a bedroom-type structure with the utilities and household structures located outside the central area. Villages classified as such represent the effects of oppression by dominators. In time, the two villages have become causes: cause of perpetuating poverty among the premise dominated and economic prosperity for those dominating.

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MATERIALS AND METHODS

The process of property growth was generally tough and long lasting in all countries, which have today a modern agriculture. It is useful to remember that, in England, this process has been triggered ever since the 16th century, when England began the process of industrialization. The process was very well characterized by T. More, who called England: "**The country where sheep eat peasants**". This is because the wool processing industry demanded a modernization of the agriculture sector and, thus the elimination of small farmers. This way, in England, in 1901 only 9% of the active population was occupied in agriculture. Such a strategy on modernizing the framework for land exploitation is no longer a valid option for Europe and would be a utopia for Romania.

An overpopulated agriculture, as the Romanian one is, cannot perform, cannot become competitive and efficient for the simple reason that, everywhere in time and space, it has been verified the direct correlation: "**many peasants \Rightarrow more poverty**", the massive presence of peasants being a brake in the modernizing of the organizational framework for land exploitation. And yet, with all the primitivism of agrarian structures in Romania, the brightest Romanian minds praised the peasantry and the Romanian village peasantry: In *In Praise of the Romanian Village*, Romanian poet Lucian Blaga notes that: "*To live in the village means to live in the cosmic horizon and in the conscience of a destiny born from eternity (...). The pride of the village to be in the centre of the world and of a destiny has held us and saved us as a people over centuries of misfortune*" (Blaga, 1937).

The most important Romanian intellectuals were entitled to praise the village as it represented the source of demographic growth for the Romanian ethnicity, contributing fundamentally to the continuance and growth of the Romanian people on ancestral lands. This continuance meant, unfortunately, the enduring and the preservation of primitive agrarian structures, which still characterizes Romanian agriculture today. Promoting a strategy of merging land ownership in Romania by lease is justified by the relative low growth possibilities of the property under the presence, yet massive, of the population employed in agriculture and that will last, certainly still one or two generations. Very relevant in this sense, it is the comparative analysis of the dynamics of land ownership in Denmark, the Netherlands and Greece (Table 1).

Table 1

The average size farm in Denmark, Netherlands and Greece (hectares)

Specification	1990	1993	1995	1997	2000	2003	2005	2007	2010	2013
Denmark	34.3	37.2	39.8	42.8	45.9	55.1	54.1	60,2	65,3	70,1
Netherlands	16.5	17.2	18.0	18.9	20.3	23.8	24.4	25,5	26,5	28,1
Greece	4.3	4.3	4.5	4.3	4.4	4.8	4.8	5,2	7,2	6,9

Source: EUROSTAT, *Date of extraction: Thu, 23 Feb. 2016*

Information sources are those regarding agrarian structures, areas and number of farms in some European countries, grouped by economic size classes (Table 2 and Table 3).

Table 2

Agricultural areas and number of farms in Austria, Denmark, France, Germany and Netherlands

Economic size class (thousands euros)	Austria		Denmark		France		Germany		Netherlands	
	Ha	No. farms	Ha	No. farms	Ha	No. farms	Ha	No. farms	Ha	No. farms
0-2	54640	15050	9190	740	193070	29310	7750	930	30	40
2-4	70670	12570	9100	940	212090	23640	37440	6070	690	490
4-8	163110	19770	17920	2360	370160	34170	167720	22470	19100	5870
8-15	250280	19520	51950	5130	498010	35160	358950	33930	35110	6180
15-25	268470	15570	71790	4560	640070	30980	464510	29060	44140	4800
25-50	510490	23290	168910	6080	2024720	56730	949980	39360	88810	6260
50-100	660340	19910	236300	4710	4633330	79040	1665580	44290	125590	6120
100-250	573300	11760	395220	4360	10853770	114410	3810240	58610	381460	12520
250-500	120440	1730	364250	2680	6208780	45720	3369970	30470	652480	13990
over 500	54730	390	1289200	5460	2097690	13670	5861110	16450	500170	9540

Source: EUROSTAT, *Date of extraction: Thu, 23 Feb. 2016*

Table 3

Agricultural areas and number of farms in Bulgaria, Czech Republic, Poland, Romania and Hungary

Economic size class	Bulgaria		Czech Republic		Poland		Romania		Hungary	
	Ha	No.	Ha	No.	Ha	No.	Ha	No.	Ha	No.
0-2	83640	134880	6140	1560	729130	369070	1987270	2381540	130320	285820
2-4	75770	49570	15090	2480	1001750	283010	1332600	570740	115830	52490
4-8	95140	26360	35060	4600	1567070	261100	1388550	373250	187150	36030
8-15	118920	13120	61980	4500	1770150	182660	812710	113770	257860	24220
15-25	131490	6600	72520	3000	1573510	112390	474110	33550	277930	14000
25-50	228330	5710	126850	2850	2364740	107970	677020	18610	445600	11870
50-100	323550	3110	192570	2420	2017660	50850	875390	7740	521080	6570
100-250	677520	2350	356210	1960	1400980	18250	1495090	4950	764860	4260
250-500	974090	1250	347080	830	682000	4000	1399870	2050	420930	1140
over500	1913040	1130	2777070	1700	1217240	2250	2269700	1350	1524170	1240

Source: EUROSTAT, *Date of extraction: Thu, 23 Feb. 2016*

For processing the databases were used various types of statistical methods. Among these, very important are the statistical indicators as absolute values, average values and relative values. Also, for a high degree of statistical processing, the regression and correlation methods were used, according to established literature methodology. Being stochastic-type causalities, it is important to take into consideration the recommendations found in specialty literature regarding data processing. *“Under stochastic relations enter those consequences formed under the influence of both essential and under the action of unsystematic factors (random), forming - in statistics - the main content of regression and correlation. [...] The fact that the externalization of need is accompanied by the action of random factors does not exclude the causality, but only confirms the essence of a particular type of causal relations; statistical causal relations, where the lawfulness does not occur individually, but only for the total average population and for a large number of investigated cases investigated”* (Merce & Merce, 2009).

RESULTS AND DISCUSSIONS

“It is widely accepted that modern agricultural structures imply an extensive use of mechanization in agriculture and the promotion of modern farming technologies in land exploitation. This hypothesis requires a thorough scientifically confirmation, both for academics and for entrepreneurs in agriculture. In the end, it is all about the quantitative assessment of the causal relationship between the agricultural dimension and the economic effect achieved per unit area.” (Merce & Merce, 2015). Such quantitative information can be very useful for shaping development strategies in the future of agriculture for various European countries (Table 4 and Table 5).

Table 4

Technical and economic size of farms in Romania (2013)

Economic size class (euro)	Average economic class	Area		No. farms		Average area	Economic impact
		ha	%	No.	%		
0-2000	1000	1987270	15,63	2381540	67,898	0,83	1198,4
2000-4000	3000	1332600	10,48	570740	16,272	2,33	1284,9
4000-8000	6000	1388550	10,92	373250	10,641	3,72	1612,8
8000-15000	11500	812710	6,39	113770	3,244	7,14	1609,9
15000-25000	20000	474110	3,73	33550	0,957	14,13	1415,3
25000-50000	37500	677020	5,33	18610	0,531	36,38	1030,8
50000-100000	75000	875390	6,89	7740	0,221	113,10	663,1
100000-250000	175000	1495090	11,76	4950	0,141	302,04	579,4
250000-500000	375000	1399870	11,01	2050	0,058	682,86	549,2
over 500000	925000	2269700	17,85	1350	0,038	1681,26	550,2

Source: Processed data

Table 5

Technical and economic size of farms in Austria (2013)

Economic size class (euro)	Average economic class	Area		No. farms		Average area	Economic impact euro/ha
		ha	%	No.	%		
0-2000	1000	54640	2,00	15050	10,78	3,63	275,4
2000-4000	3000	70670	2,59	12570	9,01	5,62	533,6
4000-8000	6000	163110	5,98	19770	14,17	8,25	727,2
8000-15000	11500	250280	9,18	19520	13,99	12,82	896,9
15000-25000	20000	268470	9,85	15570	11,16	17,24	1159,9
25000-50000	37500	510490	18,72	23290	16,69	21,92	1710,9
50000-100000	75000	660340	24,22	19910	14,27	33,17	2261,3
100000-250000	175000	573300	21,03	11760	8,43	48,75	3589,7
250000-500000	375000	120440	4,42	1730	1,24	69,62	5386,5
over 500000	760000	54730	2,01	390	0,28	140,33	5415,7

Source: Processed data

The fact is eloquently highlighted using graphics (Figure 1 and Figure 2).

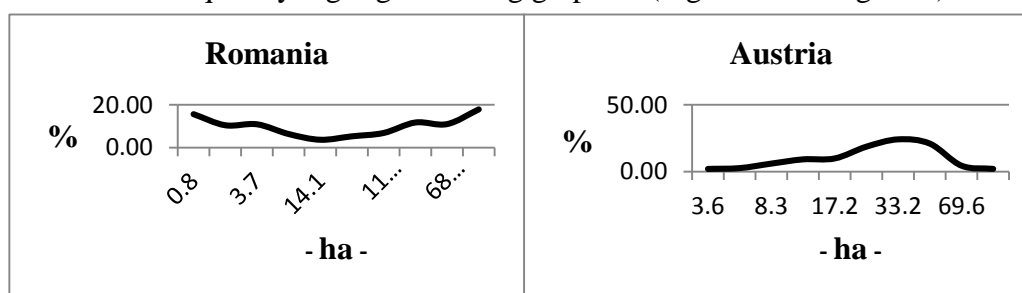


Fig. 1 – Areas distribution depending on the agricultural size of farms in Romania and Austria

Unlike the structure of agricultural holdings in Austria, in Romania the structure lacks "core", is a feudal structure, similar to those from boyars times. In this sense, it is important to notice also the farm size amplitude (from 0.8 to 1681.3 in Romania and from 3.6 to 140.3 in Austria). However, it is well known the fact that the objective and vector competitive spirit of progress is achieved by the presence of medium classes; the small ones don't have decision-making power, and those too large can practice arbitrarily monopoly policy. It is one of the major brakes in promoting progress in Romanian agriculture, difficult to overcome because this country has deep historical roots, namely the lack of policies to stimulate medium-sized properties.

The normal distribution of areas depending on the average size of farms in Austria, however, is less common. In many developed countries in Western Europe can be seen a polarization of areas in medium farms with the drastic tendency to reduce small ones, but a lack of feudal properties (Table 6, Table 7 and Figure 2).

Table 6

Technical and economic size of farms in Denmark (2013)

Economic size class (euro)	Average economic class	Area		No. of farms		Average area	Economic impact euro/ha
		ha	%	No.	%		
0-2000	1000	9190	0,35	740	2,00	12,42	80,5
2000-4000	3000	9100	0,35	940	2,54	9,68	309,9
4000-8000	6000	17920	0,69	2360	6,37	7,59	790,2
8000-15000	11500	51950	1,99	5130	13,86	10,13	1135,6
15000-25000	20000	71790	2,75	4560	12,32	15,74	1270,4
25000-50000	37500	168910	6,46	6080	16,42	27,78	1349,8
50000-100000	75000	236300	9,04	4710	12,72	50,17	1494,9
100000-250000	175000	395220	15,12	4360	11,78	90,65	1930,6
250000-500000	375000	364250	13,94	2680	7,24	135,91	2759,1
over 500000	660000	1289200	49,32	5460	14,75	236,12	2795,2

Source: Processed data

Table 7

Technical and economic size of farms in the Netherlands (2013)

Economic size class (euro)	Average economic class	Area		No. of farms		Average area	Economic impact euro/ha
		ha	%	No.	%		
0-2000	1000	30	0,00	40	0,06	0,75	1333,3
2000-4000	3000	690	0,04	490	0,74	1,41	2130,4
4000-8000	6000	19100	1,03	5870	8,92	3,25	1844,0
8000-15000	11500	35110	1,90	6180	9,39	5,68	2024,2
15000-25000	20000	44140	2,39	4800	7,29	9,20	2174,9
25000-50000	37500	88810	4,81	6260	9,51	14,19	2643,3
50000-100000	75000	125590	6,80	6120	9,30	20,52	3654,7
100000-250000	175000	381460	20,65	12520	19,02	30,47	5743,7
250000-500000	375000	652480	35,32	13990	21,26	46,64	8040,5
over 500000	445000	500170	27,07	9540	14,50	52,43	8487,7

Source: Processed data

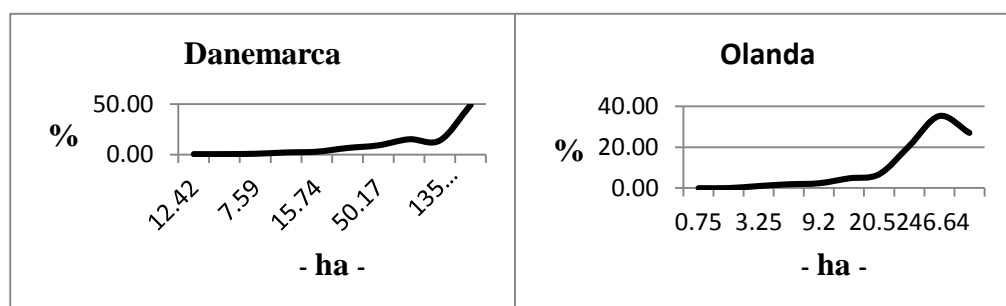


Fig. 2 – Areas distribution depending on the agricultural size of farms in Denmark and Netherlands

The very different agricultural structures represent the effects of centuries of world division into dominant and dominated nations. The villages themselves, in their archaic or modern form, are the result of this division. For those dominated, the village survived as tribal structures with primitive and impoverished households where people lived together with the few animals they possessed. Dominators villages were settlements that evolved around the center of the village and with household structures outside the main living area, on the surrounding properties. Thus, crystallized over centuries, the villages have become in time causes of economic stagnation for the needy ones, namely prosperity and economic progress for dominators. These consequences are eloquently illustrated by the causal relationship between the farm size (households) and business results achieved in euro / ha (Table 8; Table 9; Figure 3; Figure 4, Figure 5, Figure 6 and Figure 7).

Table 8

Correlation between farm size and economic performance in Austria, Denmark, France, Germany and Netherlands

Economic size class (euro)	Austria		Denmark		France		Germany		Netherlands	
	D. A. *)	Euro/ha	D. A.	Euro/ha	D. A.	Euro/ha	D. A.	Euro/ha	D. A.	Euro/ha
0-2000	3,63	275,4	12,42	80,5	6,59	151,8	8,33	120,0	0,75	1333,3
2000-4000	5,62	533,6	9,68	309,9	8,97	334,4	6,17	486,4	1,41	2130,4
4000-8000	8,25	727,2	7,59	790,2	10,83	553,9	7,46	803,8	3,25	1844,0
8000-15000	12,82	896,9	10,13	1135,6	14,16	811,9	10,58	1087,0	5,68	2024,2
15000-25000	17,24	1159,9	15,74	1270,4	20,66	968,0	15,98	1251,2	9,20	2174,9
25000-50000	21,92	1710,9	27,78	1349,8	35,69	1050,7	24,14	1553,7	14,19	2643,3
50000-100000	33,17	2261,3	50,17	1494,9	58,62	1279,4	37,61	1994,4	20,52	3654,7
100000-250000	48,75	3589,7	90,65	1930,6	94,87	1844,7	65,01	2691,9	30,47	5743,7
250000-500000	69,62	5386,5	135,91	2759,1	135,80	2761,4	110,60	3390,6	46,64	8040,5
over 500000	140,33	5415,7	236,12	2795,2	153,45	2802,2	356,30	3648,6	52,43	8487,7
Correlation coefficient	0,907		0,867		0,981		0,778		0,990	
Average size	19,5		70,6		59,9		59,3		28,1	

*) – farm size (ha)

Table 9

Correlation between farm size and economic performance in Bulgaria, Czech Republic, Poland, Romania and Hungary

Economic size class (euro)	Bulgaria		Czech Republic		Poland		Romania		Hungary	
	D. A. *)	Euro/ha	D. A.	Euro/ha	D. A.	Euro/ha	D. A.	Euro/ha	D. A.	Euro/ha
0-2000	0,62	1612,6	3,94	254,1	1,98	506,2	0,83	1198,4	0,46	2193,2
2000-4000	1,53	1962,7	6,08	493,0	3,54	847,5	2,33	1284,9	2,21	1359,5
4000-8000	3,61	1662,4	7,62	787,2	6,00	999,7	3,72	1612,8	5,19	1155,1
8000-15000	9,06	1268,8	13,77	834,9	9,69	1186,7	7,14	1609,9	10,65	1080,2
15000-25000	19,92	1003,9	24,17	827,4	14,00	1428,5	14,13	1415,3	19,85	1007,4
25000-50000	39,99	937,8	44,51	842,5	21,90	1712,2	36,38	1030,8	37,54	998,9
50000-100000	104,04	720,9	79,57	942,5	39,68	1890,2	113,10	663,1	79,31	945,6
100000-250000	288,31	607,0	181,74	962,9	76,77	2279,7	302,04	579,4	179,54	974,7
250000-500000	779,27	481,2	418,17	896,8	170,50	2199,4	682,86	549,2	369,24	1015,6
over 500000	1692,96	472,5	1633,57	918,2	541,00	2218,1	1681,26	550,2	1229,17	1016,9
Correlation coefficient	-0,629		0,322		0,583		-0,643		-0,244	
Average size	18,9		154,1		10,3		3,6		10,6	

*) – farm size (ha)

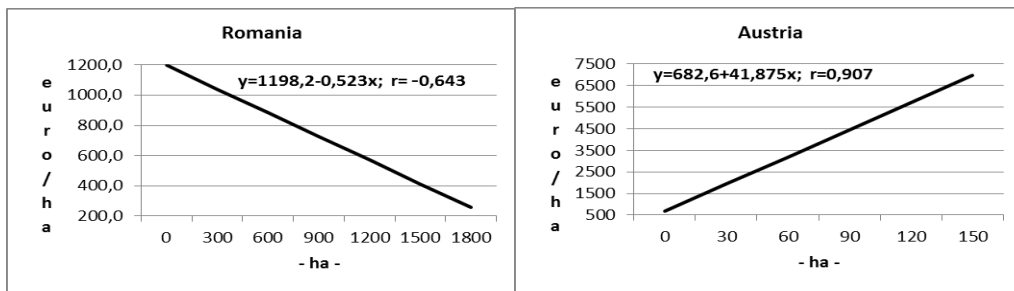


Fig. 3 – Size impact on the economic effect in Romania and Austria

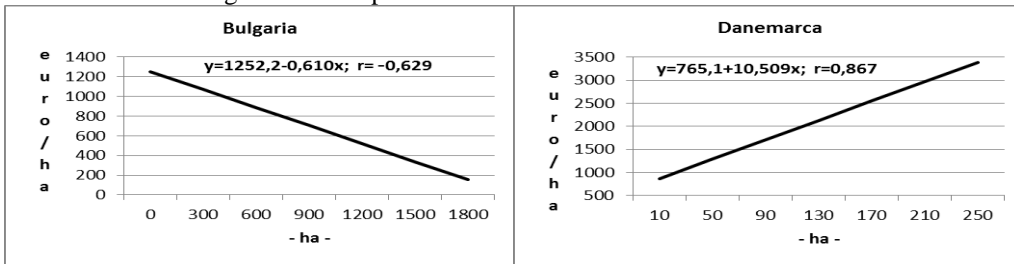


Fig. 4 – Size impact on the economic effect in Bulgaria and Denmark

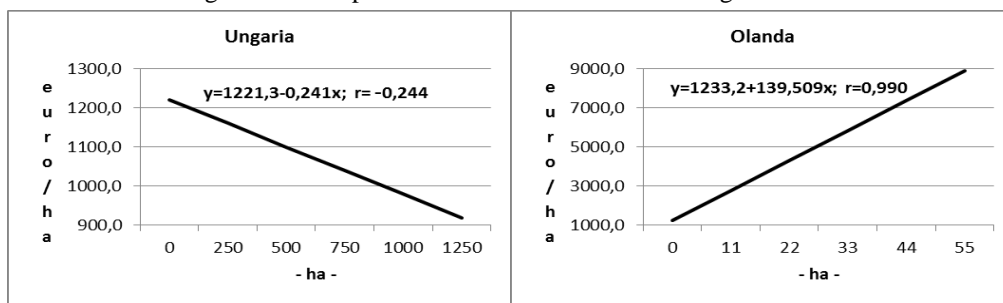


Fig. 5 – Size impact on the economic effect in Hungary and the Netherlands

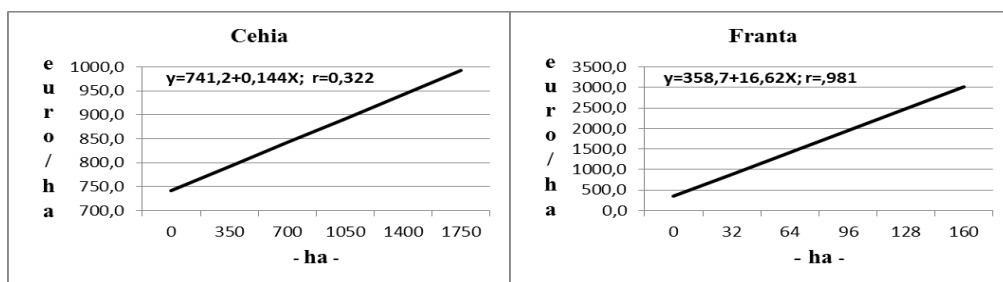


Fig. 6 – Size impact on the economic effect in Czech Republic and France

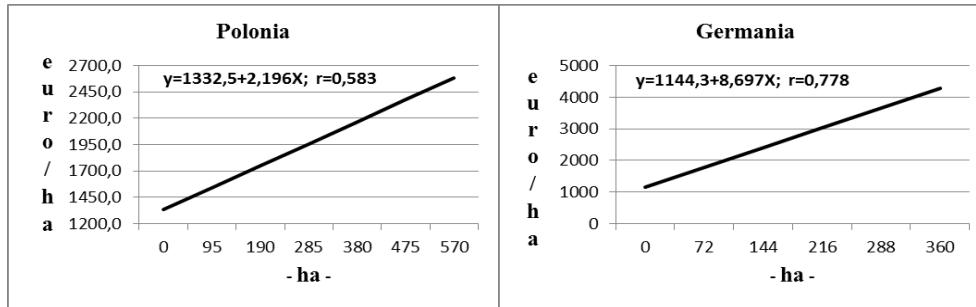


Fig. 7 – Size impact on the economic effect in Poland and Germany

The comparative analysis of economic performance made by developed and developing countries shows that size is a necessary factor for achieving notable economic performance, but it is not sufficient.

It may be noted that in Western European countries, with an agriculture very strongly capitalized, there is an intense direct correlation between farm size and economic performance, the causality relationship being statistically assured and through correlation coefficients which, usually, tend to be value one. A parallel between the size of correlation coefficients for the two country groups is quite illuminating (Table 10).

Table 10

Country group	Correlation coefficients				
Performing	Austria	Denmark	France	Germany	Netherlands
	0,907	0,867	0,981	0,778	0,990
Nonperforming	Romania	Bulgaria	Czech Republic	Poland	Hungary
	-0,643	-0,629	0,322	0,583	-0,244

In Central and Eastern European countries, countries that are generally poorly capitalized, there is a weak or, paradoxically, even negative correlation between farm size and economic performance per hectare. It is typical in this respect, the case of Romania, of Bulgaria and Hungary. Certainly, for these countries, size influence is mediated by a complex of specific factors, often with a very harmful effect on the organizational framework. The first and most important factor is the lack of capitalization. Besides the lack of capital in each country can be evoked factors that annul the positive influence of the organizational framework.

In Romania and Bulgaria, for instance, can be suspected practices of collecting subsidies without cultivating the land. Also, many experts believe that a large part of the agricultural production is sold on the black market, data reported by EUROSTAT being substantially true.

In Hungary's case, it appears that the substantial efficiency of small properties is due to growing small businesses such as: fur animals, exotic birds, exotic fish etc., rooted since the communist era.

CONCLUSIONS

1. The countries of the world have been, are and will be divided into dominant and dominated;
2. Modernisation of agricultural structures is an essential prerequisite for competitiveness and for achieving competitive economic performance in agriculture;
3. Competitive laws, without protectionist regulations, always favor dominant countries that increase benefits in relation to those dominated;
4. The causality relationship between farm size and economic performance in developed countries has a certain stability, a stability that has crystallized over time, and calculations prove that it is ensured statistically and through the size of correlation coefficients with positive values tending to one;

5. The extension of farms is not enough unless it is associated with a high degree of capitalization of agriculture, capitalization being a binding partner;
6. In Central and Eastern European countries, countries that are generally poorly capitalized, there is a weak or even negative correlation between farm size and economic performance per hectare. It is typical in this respect, the case of Romania, of Bulgaria and Hungary;
7. In Romania, the agrarian structure lacks "core", being characterized as a feudal structure, similar to boyars times. This conclusion is backed up by size farm amplitude (from 0,8 to 1681,3 in Romania and from 3,6 to 140,3 in Austria);
8. Besides the lack of capital in each country, there can be evoked factors that annihilate the positive influence of the organizational framework. In Romania and Bulgaria, for instance, can be suspected practices of collecting subsidies without cultivating the land. Also, many experts believe that a large part of the agricultural production is sold on the black market, data reported by EUROSTAT being substantially tithed;
9. In a similar situation is also Hungary, with the observation that the inverse relationship between farm size and economic performance is caused largely by favorable economic effects particularly of small farms specialized in the provision of high impact commercial activities;
10. A special case is also the Czech Republic that, by maintaining agricultural structures from the communist period, on new legal bases, had in 2013 the largest average size of farms in the European Union (154,1 ha);
11. Poland, by promoting national strategies for economic development, especially in agriculture, is approaching the performance achieved by Germany.

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