METHODS OF ASSESSMENT THE CAPITALIZATION OF FARMS WITH PRODUCTION MEANS AND ANALYSES ON FIELD SURVEY

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Abstract

The research approaches the identification of factors generating non-farm economic performance in Romanian agricultural holdings. Based on evidences from field studies on equipping farms with productive capital goods, presents results obtained by applying a model of computation and analysis for the evaluation of farm capitalization – a determinant of the economic viability of farms, with sustainable contributions to competitiveness increase in the agricultural sector. The model allowed the evaluation of the initial and real cost of mechanical means used in the sample farms owned farms, an estimated replacement value of machinery obtained by calculating the value of depreciation and the present cost of agricultural machines, representing the average value of net investment and the average quantum by types of agricultural mechanical equipment and by farms. Clustering method was applied on the statistical indicators corresponding to the sample farms, according to the considered selection criterion. The article presents the results of data processing, calculations and analyses that reveal assessments on the studied farms, by regional profile and by holding's legal status (legal or natural person).

Key terms: agricultural holdings, productive capital, investment, sustainable development

Imbalances and weaknesses in the external performance of the agricultural sector ground on several causes at the micro level (Otiman, 2009). The paper deals with the study of non-performance general factors in Romania's economy at farm level, by analyzing the technical capitalization of the holdings as, either driver, or restrictive determinant of competitiveness. On the quantitative evolution, structure and quality of productive fixed capital depends to a great extent the ability to manage and use land resources properly, and thus, future economic development of the farm. The article presents the outcome provided by applying a calculation model to evaluate farm capitalization, in the limits of the information provided by field surveys.

MATERIAL AND METHOD

The paper used information from field surveys based on statistical sample of agricultural holdings and includes the assessment of farms capitalization with productive means, by constructing and applying a complex model of measurement and analysis.

The research exploited the database information obtained by processing the questionnaires in selected localities of all statistical regions of Romania, in 2007-2008 - for the information homogeneity, 406 questionnaires have been selected, followed by the selection of the relevant variables, building and establishing the needed indicators and their inclusion in worksheets, by types of machines used in farm property (Rusali, 2009).

A computation model have been designed to evaluate the updated cost of the mechanical means of the sample, estimates of their replacement value, obtained by calculating the depreciation cost and the present value of machinery represented by the investment net value. The results reveals evaluations obtained by aggregating and selecting the appropriate indicators at regional level of analysis, at the farm level and by the legal status of the holding, namely, natural or legal persons.

In order to estimate the production technical capital, it was necessary to calculate the value of the mechanical factors used in holdings' property. Comparable prices have been obtained through intermediate operations required to update the prices: nominal purchase prices have been deflated with the Consumer Price Index (CPI) for non-food goods, provided by NIS, at 2009 reference period. The purchasing prices were expressed in Euros at the annual exchange rate of the acquisition period, provided by the central bank, and then adjusted to current exchange rate. The analyses were provided with the necessary information by applying the grouping method of the statistical indicators corresponding to the sample farms, according to the considered selection criteria (Rusali, 2010).

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RESULTS AND DISCUSSION

Tables 1-3 contain results of the evaluation of agricultural tractors owned in the studied farms, by regional profile and legal status of the holding.

Table 1

Regional distribution of the sample farms, by tractors' value

	No.	No. farms	Thou. RON/ farm	Cost of capitaliz. (thou. RON)	Cost of depreciation (thou RON)	Net Invest. (thou. RON)
R1	88	52	17	1091	592	869
R2	156	54	44	4677	1105	2367
R3	237	79	51	6888	1997	4034
R4	35	44	6	367	56	245
R5	155	40	8	378	111	313
R6	73	66	7	710	206	475
R7	201	62	54	4557	1463	3322
R8	42	9	69	947	201	621

Table 2

Regional distribution of the natural person farms, by tractors' value

	No.	No. farms	Thou. RON/ farm	Cost of capitaliz. (thou. RON)	Cost of depreciation (thou RON)	Net Invest. (thou. RON)
R1	18	34	6	241	60	206
R2	18	23	11	271	87	254
R3	28	44	3	223	44	118
R4	24	38	4	179	38	163
R5	26	27	5	169	73	139
R6	33	53	3	190	32	168
R7	37	35	26	966	148	898
R8	2	2	3	6	1	6

Table 3

Regional distribution of the legal farms, by tractors' value

	No.	No. farms	Thou. RON/ farm	Cost of capitaliz. (thou. RON)	Cost of depreciation (thou RON)	Net Invest. (thou. RON)
R1	70	18	37	850	533	664
R2	138	31	68	4406	1018	2113
R3	209	35	112	6665	1953	3917
R4	11	6	14	188	18	82
R5	129	13	13	209	38	174
R6	40	13	24	519	174	307
R7	164	27	90	3592	1315	2425
R8	40	7	88	941	200	615

The detailed results of the analysis include the regional distribution of agricultural holdings in the sample by the tractors' value, by the types and classes of power, and the value of trailers, trucks and off-road cars - the cost of depreciation and net investment. The column indicating "Thousands RON/farm" shall mean the amount of the net investment per farm (agricultural holding). As indicated by *figure 1*, there are observed disparities between agricultural holdings concerning the level of net investment per farm and the number of tractors endowment of farms, but also a non-uniform regional distribution relative to the amount of investment.

At the individual farms, i.e. agricultural holdings with the natural person status, tractors' capitalization is far below that of the commercial farms, i.e. legal entities: on the sample average the estimates amounted to 7618 RON on the holding, respectively, towards 68639 RON. The sample average estimated a net investment in agricultural tractors amounting to 30163 RON per farm.

Tables 4, 5, 6 contain the results of the evaluations to the soil processing and sowing machines, describing the regional profile, by the level of studied holdings and legal status of farms

Table 4

Regional distribution of the sample farms, by the value of soil processing and sowing machines

	No.	No. farms	Thou. RON/ farm	Cost of capitaliz. (thou. RON)	Cost of depreciation (thou RON)	Net Invest. (thou. RON)
R1	194	52	4.2	446.8	114.2	218.8
R2	378	54	18.9	2588.9	351.4	1019.1
R3	526	79	22.5	3796.7	961.6	1777.3
R4	89	44	2.0	114.8	20.1	87.1
R5	197	40	3.2	155.3	37.5	128.9
R6	120	66	1.9	182.3	45.4	123.1
R7	398	62	13.2	1235.8	417.8	819.9
R8	92	9	34.3	402.5	134.8	308.6

Table 5

Regional distribution of the natural person farms, by soil processing and sowing machines' value

	No.	No. farms	Thou. RON/ farm	Cost of capitaliz. (thou. RON)	Cost of depreciation (thou RON)	Net Invest. (thou. RON)
R1	39	34	0.7	61.2	11.8	24.7
R2	44	23	3.3	123.4	21.5	75.7
R3	52	44	1.5	82.8	15.3	64.7
R4	65	38	1.8	81.8	16.4	68.0
R5	56	27	3.2	107.1	28.3	86.9
R6	120	53	2.3	182.3	45.4	123.1
R7	78	35	2.6	108.1	36.4	92.4
R8	39	34	0.7	61.2	11.8	24.7

Table 6

Regional distribution of the legal farms, by soil processing and sowing machines' value

	No.	No. farms	Thou. RON/ farm	Cost of capitaliz. (thou. RON)	Cost of depreciation (thou RON)	Net Invest. (thou. RON)
R1	155	18	10.8	385.6	102.3	194.1
R2	334	31	30.4	2465.5	329.9	943.5
R3	474	35	48.9	3713.9	946.3	1712.5
R4	24	6	3.2	33.0	3.7	19.1
R5	141	13	3.2	48.2	9.2	41.9
R6	0	13	0	0	0	0
R7	320	27	26.9	1127.7	381.5	727.5
R8	90	7	39.6	399.7	127.0	277.1

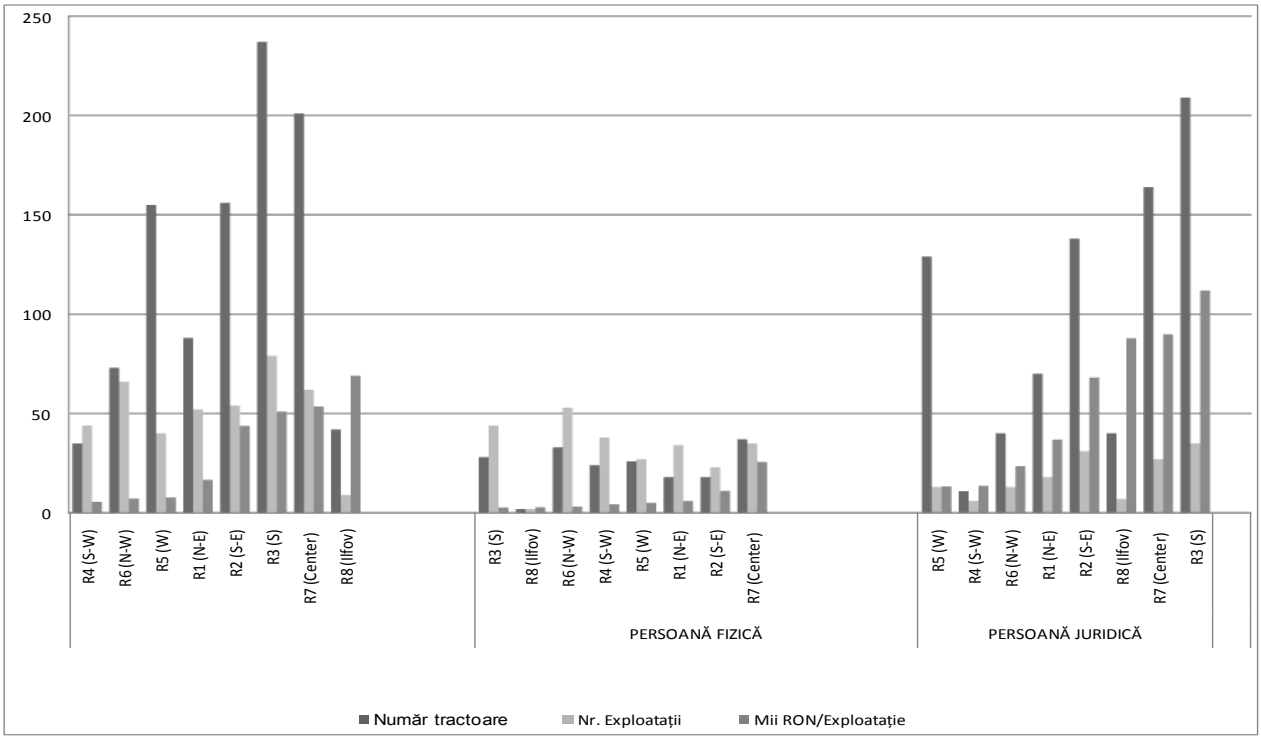

Figure 1 **Regional distribution of the agricultural holdings, by agricultural tractors' value and by legal status**

Detailed results include the regional distribution of agricultural holdings in the sample by the value of soil processing and sowing machines, and types – the cost of depreciation and net investment and the assessments corresponding to individual farms and legal entities. As synthetically presented in tables 4-6, the extremely low estimated values for the soil processing and sowing machines shall indicate a major shortcoming of these machines that work in aggregate with tractors. There are to be underlined the gaps between the net investments per holding and the number of soil processing and sowing machines used in farm's property, and also a certain superiority concerning investment on the legal person holdings. It was estimated an average value of these machines of 2098 RON per individual farm, onto 26104 RON per legal farm. The sample average was valued at 11041 RON per agricultural holding.

Tables 7 to 9 contain the results of the assessments on the fertilizers and chemical treatment spreading machines, in the regional profile, at the level of holdings in the sample and by their legal status. Fertilizing machines and chemical treatments machines have a similar situation as regional distribution, but the average amount per farm of the net investment is dramatically lower. On these machines, it was estimated an average value of 1165 RON per holding with the status of natural person and 4818 RON per legal farm, resulting a sample average of 2514 RON per farm. Detailed results include the regional distribution of the agricultural holdings in the sample by the value of fertilizers and chemical treatment spreading machines, by types - net investment and the depreciation cost assessments corresponding to the legal status of the holding.

Table 7

Regional distribution of the sample farms, by the fertilizing and chemical treatment machines' value

	No.	No. farms	Thou. RON/ farm	Cost of capitaliz. (thou. RON)	Cost of depreciation (thou RON)	Net Invest. (thou. RON)
R1	35	52	0.6	48.8	15.5	32.5
R2	91	54	3.9	396.2	85.1	212.9
R3	99	79	4.1	554.9	118.1	322.9
R4	7	44	0.2	11.0	2.4	9.4
R5	37	40	0.9	55.4	19.4	36.1
R6	38	66	3.2	284.7	145.4	211.1
R7	99	62	3.0	326.1	66.2	185.0
R8	16	9	1.2	16.3	2.8	11.0

Table 8

Regional distribution of natural person farms, by the fertilizing and chemical treatment machines' value

	No.	No. farms	Thou. RON/ farm	Cost of capitaliz. (thou. RON)	Cost of depreciation (thou RON)	Net Invest. (thou. RON)
R1	7	34	0.2	8.3	2.0	6.5
R2	7	23	1.0	24.7	6.0	23.3
R3	7	44	0.1	12.5	1.3	5.7
R4	2	38	0.0	1.2	0.2	1.1
R5	10	27	0.2	7.0	4.4	6.2
R6	38	53	4.0	284.7	145.4	211.1
R7	24	35	1.3	49.5	21.2	44.3
R8	1	2	0.0	1.9	0.0	0.0

Table 9

Regional distribution of legal farms, by the fertilizing and chemical treatment machines' value

	No.	No. farms	Thou. RON/ farm	Cost of capitaliz. (thou. RON)	Cost of depreciation (thou RON)	Net Invest. (thou. RON)
R1	28	18	1.4	40.5	13.5	26.0
R2	84	31	6.1	371.5	79.1	189.5
R3	92	35	9.1	542.4	116.9	317.2
R4	5	6	1.4	9.8	2.1	8.3
R5	27	13	2.3	48.4	15.0	29.9
R6	0	13	0.0	0.0	0.0	0.0
R7	75	27	5.2	276.6	45.0	140.8
R8	15	7	1.6	14.5	2.8	11.0

Tables 10, 11 and 12 indicate the results of evaluations on field survey data regarding the combines and harvesting machines used in farms' property, their regional profile, aggregated at farm level, and by the legal status of the farm.

The average value of net investment per farm, is evidently much lower on individual farms than on commercial farms, given the differences in average physical farm's size: from 0.3 ha (in R6, Region North-West) to 56 ha (in R2, South-East), per individual farm, and from 66 ha (in R4, South-West), to 888 ha (in R3, South), per commercial farms.

Table 10

Regional distribution of the sample farms, by combines' and harvesting machines' value

	No.	No. farms	Thou. RON/ farm	Cost of capitaliz. (thou. RON)	Cost of depreciation (thou RON)	Net Invest. (thou. RON)
R1	41	52	13.8	818.5	210.4	717.7
R2	76	54	33.8	2671.5	706.7	1827.5
R3	106	79	41.8	5063.1	859.8	3301.4
R4	7	44	0.4	19.7	3.5	18.4
R5	39	40	16.4	726.4	612.2	657.8
R6	37	66	3.6	313.3	108.0	237.1
R7	87	62	10.5	965.0	259.8	653.7
R8	38	9	68.3	1187.9	219.3	614.4

Table 11

Regional distribution of the natural person arms, by harvesters' and harvesting machines' value

	No.	No. farms	Thou. RON/ farm	Cost of capitaliz. (thou. RON)	Cost of depreciation (thou RON)	Net Invest. (thou. RON)
R1	11	34	3.5	130.8	59.3	118.3
R2	14	23	28.2	722.8	11.7	648.4
R3	5	44	1.2	96.8	18.4	52.3
R4	4	38	0.4	18.0	3.3	16.8
R5	10	27	4.4	126.2	108.3	117.6
R6	16	53	0.9	52.4	13.6	48.9
R7	33	35	3.6	138.7	45.2	125.6
R8	1	2	1.1	2.6	0.3	2.3

As shown in *figure 2*, according to records of survey, the level and distribution of investments grow in importance on combines and harvesting machines, although there are imbalances between regions.

Table 12

Regional distribution of the legal farms, by harvesters' and harvesting machines' value

	No.	No. farms	Thou. RON/ farm	Cost of capitaliz. (thou. RON)	Cost of depreciation (thou RON)	Net Invest. (thou. RON)
R1	30	18	33.3	687.7	151.0	599.5
R2	62	31	38.0	1948.7	695.0	1179.1
R3	101	35	92.8	4966.3	841.4	3249.2
R4	3	6	0.3	1.7	0.2	1.6
R5	29	13	41.6	600.2	503.9	540.2
R6	21	13	14.5	260.9	94.5	188.2
R7	54	27	19.6	826.3	214.6	528.1
R8	37	7	87.5	1185.3	219.0	612.2

The analysis provides results on the regional distribution of farms in the sample by the value of combines and harvesters used in farms' property, by type - net investment and depreciation costs and the estimates corresponding to farm's legal status. It has been estimated an average value of these assets of 4414 RON per farm with status of natural person, and of 45987 RON per legal farm, while the sample average was estimated to 19773 RON per farm.

In Tables 13 to 15 are presented results of assessments to other agricultural machines used in farms endowment, including fixed and mobile irrigation installations and milking devices. The results contain assessments get by aggregating and selecting the indicators appropriated to the analyses on regional profile, at farm level and by the legal status of the farm.

Table 13

Regional distribution of the sample farms, by the value of irrigation installations and milking devices

	No.	No. farms	Thou. RON/ farm	Cost of capitaliz. (thou. RON)	Cost of depreciation (thou RON)	Net Invest. (thou. RON)
R1	5	52	0.7	41.8	8.2	37.1
R2	61	54	15.5	1002.0	328.2	838.8
R3	40	79	4.1	1148.0	130.8	325.5
R4	1	44	0.0	0.0	0.0	0.0
R5	7	40	1.1	48.9	16.4	45.5
R6	19	66	2.2	171.9	35.7	146.2
R7	25	62	5.1	408.2	167.1	314.7
R8	18	9	56.4	670.6	505.4	507.4

Comparing to the other types of machinery of the farm sample, endowment with these assets are the lowest, numerically and as net investment.

Results detailed on these types of facilities comprising the assessments based on information from questionnaires, show regional distribution of sample farms' evaluations, by the value of irrigation fixed and mobile facilities and of the milking facilities and devices used in farms' property - net investment and cost of depreciation

and the corresponding assessments on individual farms - with natural person status, and on those with legal status.

To these categories together, the assessments on net investment amounted to 10476 RON per commercial farm, compared to 2515 RON per individual farm, while the average sample yielding a value of 5457 RON per agricultural holding.

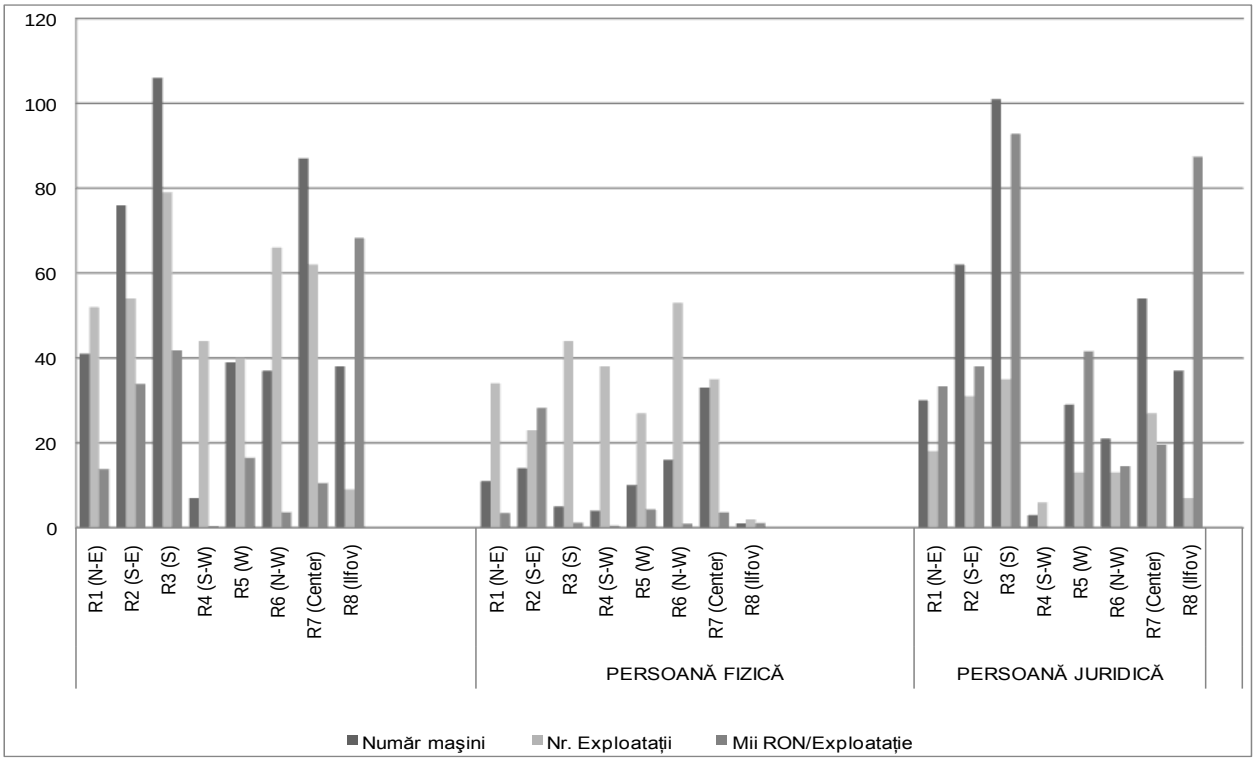

Figure 2 **Regional distribution of farms, by harvesters' and harvest machines' value and by legal status**

Table 14

Regional distribution of natural person farms, by the value of irrigation installations and milking devices

	No.	No. farms	Thou. RON/ farm	Cost of capitaliz. (thou. RON)	Cost of depreciation (thou RON)	Net Invest. (thou. RON)
R1	4	34	0.3	11.8	4.4	10.1
R2	16	23	20.9	520.7	199.0	480.6
R3	3	44	0.1	7.0	2.8	6.5
R4	1	38	0.0	0.0	0.0	0.0
R5	6	27	0.7	19.2	14.5	17.9
R6	15	53	0.6	38.9	8.2	30.6
R7	15	35	2.8	154.2	51.9	97.7
R8	1	2	0.3	0.6	0.1	0.6

Table 15

Regional distribution of legal farms, by the value of irrigation installations and milking devices

	No.	No. farms	Thou. RON/ farm	Cost of capitaliz. (thou. RON)	Cost of depreciation (thou RON)	Net Invest. (thou. RON)
R1	1	18	1.5	30.0	3.9	27.0
R2	45	31	11.6	481.3	129.3	358.2
R3	37	35	9.1	1141.0	128.0	319.0
R4	0	6	0.0	0.0	0.0	0.0
R5	1	13	2.1	29.7	2.0	27.6
R6	4	13	8.9	133.0	27.4	115.6
R7	10	27	8.0	254.0	115.2	217.1
R8	17	7	72.4	669.9	505.4	506.9

CONCLUSIONS

The outcome of the analyses indicate the lack of modernization of agricultural holdings, that requires massive investments, with a significant public component, in technical means, including the agricultural mechanization and the irrigation systems. The productive capital will facilitate the restructuring by the development of agricultural and rural households, giving them opening options toward agricultural, food and non-agricultural markets.

The information and data on holdings' endowment with own means of mechanization the farming activities have a poor availability in the published statistics. The lack in data has two main causes of the national methodology: the structural surveys in agriculture does not record detailed specialized data, and the individual farms do not have accounting system or keep farm budgets.

The harmonized European methodology RICA requires accounts only for commercial farms included in the sample surveys, listed in the farm fiche (EC, 2007).

Sustainable development means long term non-negative developments; at the rural level as well, small holdings have an economic, social and

environmental importance, giving them a key role to ensure the development of regional competitiveness and sustainability in accordance with the requirements of eco-conditionality and social historical specificities of the zones. Within this context, rural sustainability implies that a integrating vision of these resistance structures in order to benefit from the support policies designated to the rural space, including agriculture.

Further research relays its utility in identifying the real problems of the agricultural sustainability related to non-profit generators, with direct influences on the sector's performance. Relevant conclusions and results can be substantiated by correlation with other indicators, such as those related to productivity and efficiency, and by research and analysis on the basis of other criteria, for example those related to the size of farms, production or geographic profiles a.s.o..

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