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ANALYSIS OF COOPERATIVES IN THE AGRICULTURAL SECTOR AND MANUFACTURING INDUSTRY-PRODUCTIVITY AND GROWTH IN BULGARIA

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Abstract

The article examines cooperatives from the Agricultural sector and the Manufacturing industry. The research focuses on the growth of cooperatives of different sizes and ages. The period of the research is 5 years. After an in-depth study of the empirical data of the studied sectors, an analysis of the rate of change in net sales revenue and their productivity is made. The productivity, growth and age of the cooperatives are expected to be positively related for the period under study. Cooperatives with longer working experience are predicted to realize a higher rate of change in net sales revenue compared to cooperatives that have been operating for a shorter period of time.

***Key words*:** *cooperatives, growth, productivity, agricultural sector, manufacturing industry, Bulgaria*

INTRODUCTION

In recent years, cooperatives have improved and become one of the widespread models for managing production factors and providing services to their members in almost all economic sectors and countries around the world [1]. With their specific principles and values in their activities, they contribute to socio-economic development. Cooperatives adapt easily and respond more effectively to economic, market and financial challenges thanks to their unique business model [15]. The impact of cooperatives on rural welfare and overall economic performance has been widely discussed in the scientific literature [16], [4], [10], [9], [17], [3], [8].

According to [7], cooperatives in the Agricultural sector have a positive effect on the modernization of agricultural machinery and technologies. This affects changes in the agricultural structure and leads to an overall improvement of the economic condition of rural areas. In recent years, the GDP of the Agricultural sector has been decreasing, but there has been an increase in the productivity of various crops such as cereals and others [14]. [11] explains these events with the fact that the development of other sectors in the economy is more pronounced. [13] believes that this is entirely due to a country's economic policies regarding agriculture and industry (manufacturing). The fact that in poor countries the Agricultural sector is a leading force, and in richer countries it is smaller and insignificant. The social significance of this phenomenon must be considered. Strong industrial development often has a negative impact on agricultural production [12], [5]. Such a sector, for example, is the Manufacturing industry. Both the Agricultural sector and the Manufacturing industry have been the subject of discussions by numerous authors over the years because they are the main driving force in the economy of most countries. In the scientific literature, there are studies of various dependencies between them such as age, growth and innovation; size and growth; productivity and growth; size and performance and others. The present study examines the relationship between productivity, growth and age.

In this context, the purpose of the paper is to study the cooperatives in Agricultural sector and Manufacturing industry in the period 2017-2021 in Bulgaria using the rate of change of net sales, growth and productivity by classes of cooperatives, according to the

European Commission NACE Rev.2 (2008), size and age.

MATERIALS AND METHODS

The productivity and growth of cooperatives is considered as an expression of net sales revenue and fixed tangible assets in the current period. For the purposes of the analysis, we define productivity as net sales revenue per 1 employee. We measure the growth of cooperatives by taking into account the dynamics of fixed tangible assets per 1 employee. The productivity and growth of cooperatives are determined as a function of their size and age (years of operation of cooperatives).

The size of the cooperatives is determined depending on the number of employees in them, according to their definition in the Law on SMEs [6] - micro: up to 10 employees, small: 10-49 employees, medium: 50-249 employees and large cooperatives over 250 employees.

The distribution of enterprises in this study is in accordance with this Law.

For the purposes of the analysis, the large cooperatives are excluded from the processing of the empirical data, due to their limited number in the current sample, which is not representative enough and would have an incorrect influence on the general analysis of the state of the problem.

Regarding the age of cooperatives, four categories are defined as follows: 0-10 years, 11-20 years, 21-30 years and over 31 years.

The cooperatives that are studied in the current article are conventionally divided as representatives of the Agricultural sector and the Manufacturing industry according to NACE Rev. 2 (2008), The EU commission established that the Agricultural sector represents Section A Agriculture, forestry and fisheries and Manufacturing industry is Section C [2].

The database used has 1,296 cooperatives, of which 1,103 are from the Agricultural sector and 193 from the Manufacturing industry. The study uses empirical data for a period of five years 2017 – 2021.

RESULTS AND DISCUSSIONS

Productivity

Based on the results obtained from the researched data, it is observed that higher cash receipts are realized for all representatives of cooperatives in the Agricultural sector. Exceptions were reported in 2019 and 2020, where industrial cooperatives realized more net sales revenue per 1 employee. Figure 1 clearly shows that during the studied period cooperatives in the Agricultural sector are characterized by higher productivity compared to cooperatives in the processing industry.

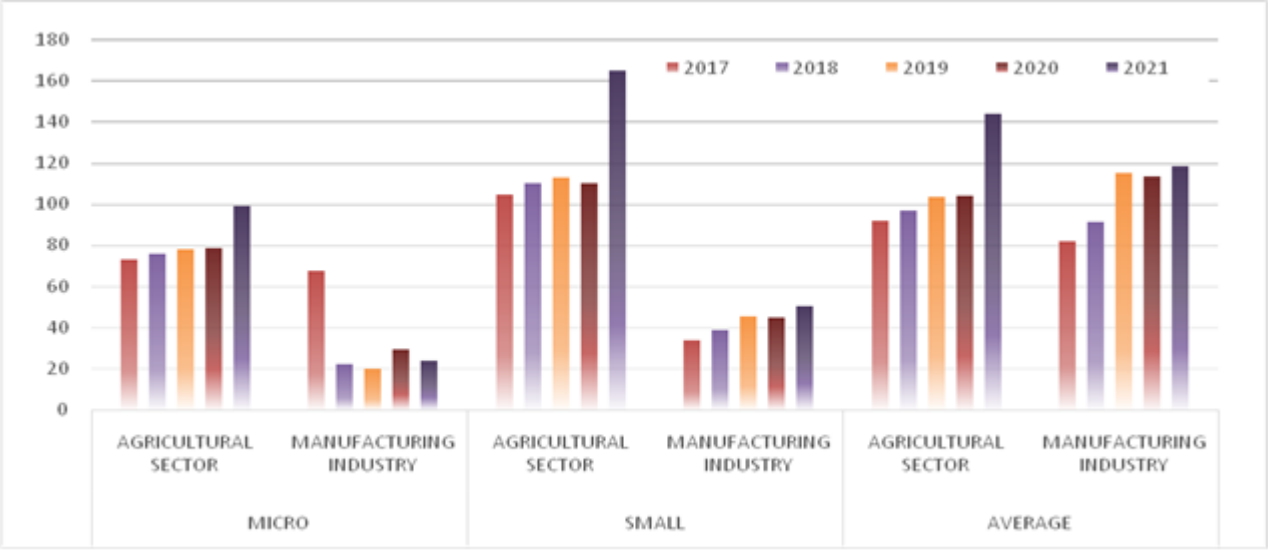

Fig. 1. Productivity of the Agricultural sector and the Manufacturing industry, 2017-2021.
Source: the author's creation.

Examining the empirical data, a trend of growth in the income of the net sales revenue per 1 employee is clearly outlined in both studied sectors, with the exception of one year each (Figure 2).

The total productivity of all cooperatives for the studied five-year period in the Agricultural sector is 1,547.50, while in the Manufacturing industry it is 898.21, which shows that it is 1.72 times higher values.

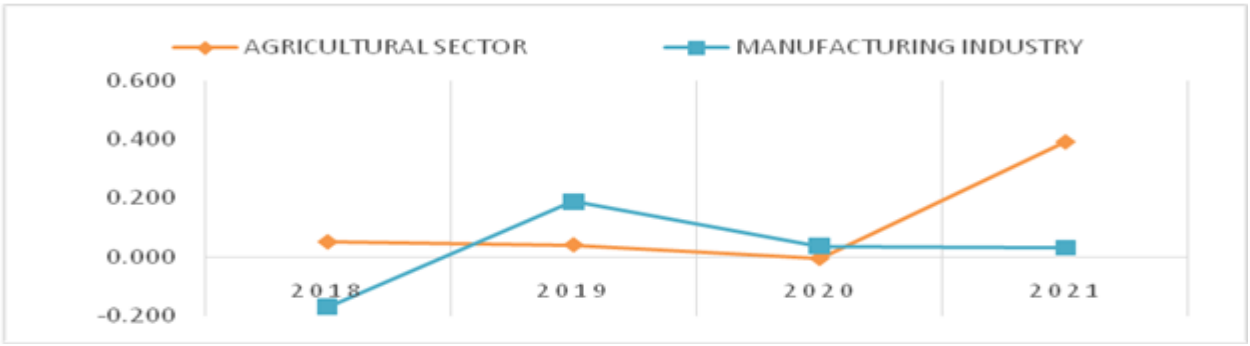

Fig. 2. Dynamics of productivity in the Agricultural sector and Manufacturing industry, 2017 - 2021
Source: the author's creation.

Based on the age factor, the agricultural cooperatives are distributed as shown in Fig. 3.

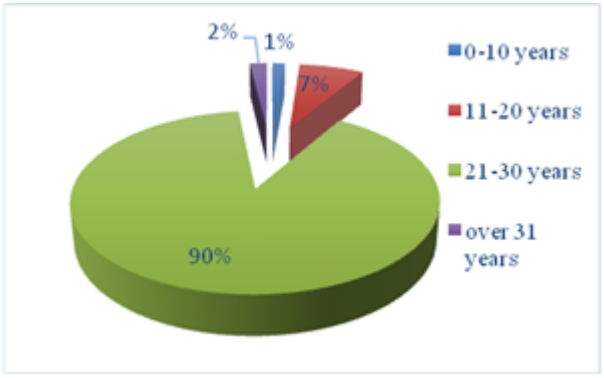

Fig. 3. Distribution of cooperatives by age, Agricultural sector
Source: the author's creation.

In the Agricultural sector, the fewest representatives are observed in the newly established cooperatives, followed by those with the most work experience (Figure 3). The most numerous are cooperatives that have existed for 21-30 years. In Manufacturing industry, the age distribution looks different (Figure 4).

Cooperatives with the longest experience are 41% of all, the fewest are from the group of beginners. The predominant number of cooperatives are again the representatives who have been active for 21-30 years.

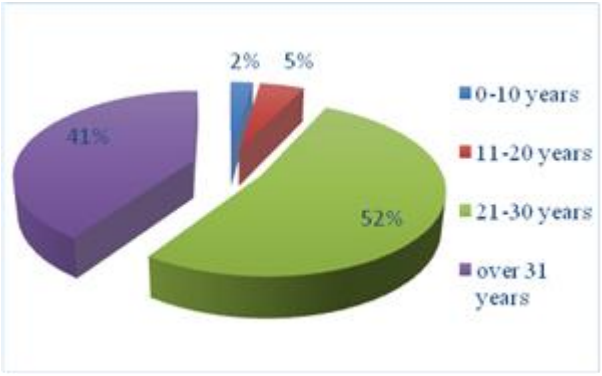

Fig. 4. Distribution of cooperatives by age, Manufacturing industry
Source: the author's creation.

Based on an in-depth study and analysis of empirical data, it is observed that cooperatives with more work experience realize higher productivity values in both studied sectors (Figures 5 and 6).

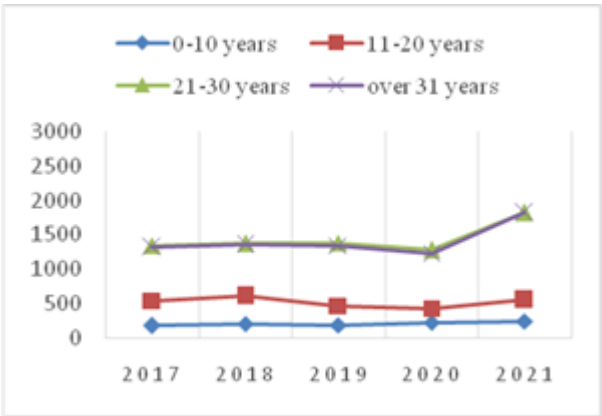

Fig. 5. Dynamics of the productivity of cooperatives in the Agricultural sector, 2017-2021
Source: the author's creation.

The statement made is proven by a detailed survey of the database of cooperatives in the studied sectors, as well as by an ANOVA analysis conducted to track the presence of significant differences at a significance level α=0.05.

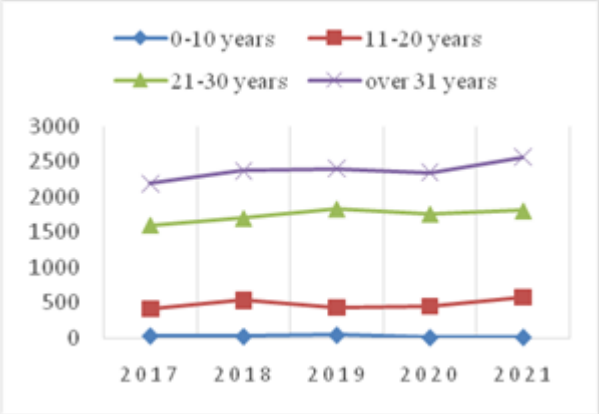

Fig. 6. Dynamics of productivity of cooperatives in the Manufacturing industry, 2017-2021
Source: the author's creation.

Growth

In this article, the growth of cooperatives is tracked based on the available fixed tangible assets per 1 employee that they own. In the database being studied, the majority of cooperatives are representatives of the Agricultural sector (85.11%).

They also show the presence of a more active development in the activities of cooperatives compared to those from the Manufacturing industry, something not so typical of practice in reality. Based on the available empirical data, it appears that the cooperatives from the Agricultural sector, which have been managing their activity for a short time or for a period of up to 10 years, are developing the fastest (Table 1).

They are followed by the cooperatives that have the longest period of service. Cooperatives that have existed for 11-20 years are observed with the least investment in fixed tangible assets per 1 employee.

In the Manufacturing industry, the cooperatives already established in the market are developing at the slowest pace, i.e. those with more than 31 years of experience.

The cooperatives that are the most prosperous and developing manage their activity for 21-30 years, followed by those that are at the beginning of their economic and labour activity.

Table 1. Average values of fixed tangible assets per 1 employee of the Agricultural sector and Manufacturing industry, distributed by age for the period 2017 - 2021

	2017		2018		2019		2020		2021	
	A.S	M.I.	A.S	M.I.	A.S	M.I.	A.S	M.I.	A.S	M.I.
0-10 years	116.94	39.59	138.33	54.42	139.78	57.13	178.51	113	181.03	113
11-20 years	126.06	42.94	83.98	42.53	87.03	46.98	97.53	90.79	147.10	84.27
21-30 years	109.75	88.57	118.95	91.59	125.85	87.72	132.44	88.39	159.08	99.79
over 31 years	114.01	42.75	124.96	45.55	140.15	61.56	138.36	63.31	177.62	77.66

Source: the author's creation.
Note: A.S.= Agricultural sector; M.I. = Manufacturing industry.

Based on the distribution of the cooperatives by age and size, it gives the impression that the cooperatives representing the Agricultural sector are developing more actively (Figure 7). Small cooperatives with 11-20 years of work experience have the highest growth, followed by micro cooperatives with the richest work experience. The manufacturing cooperatives with the highest growth are those that have already established themselves in the market and have been operating for more than 20 years. This is explained by the fact that they already have enough realized financial means and can afford to invest part of them for the future development and prosperity of the cooperatives.

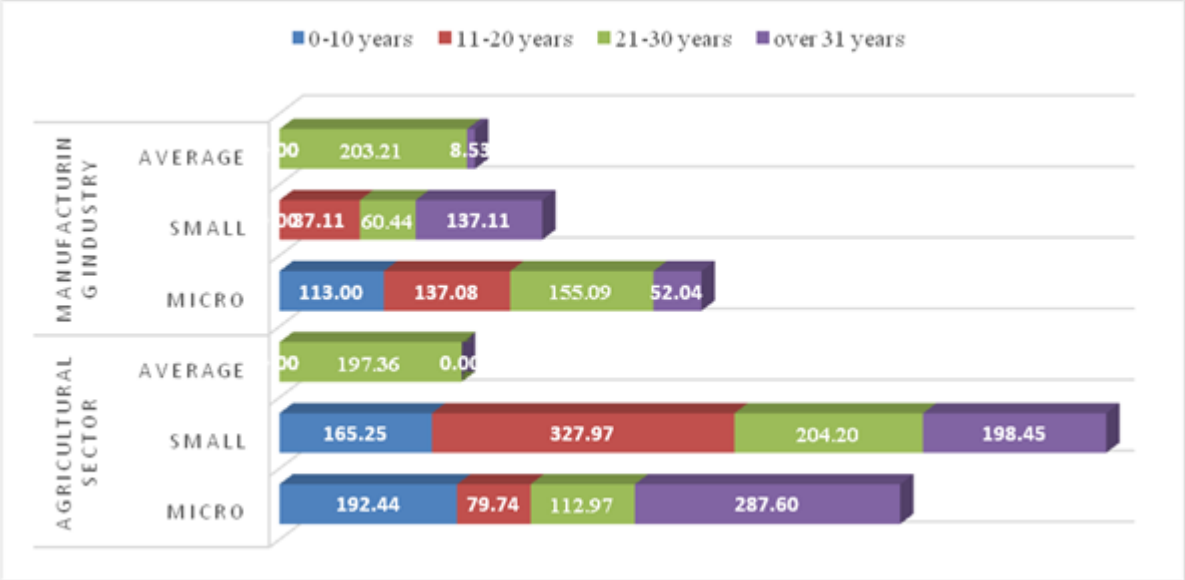

Fig. 7. Distribution of fixed tangible assets per 1 employee by size and age of cooperatives from the Agricultural sector and Manufacturing industry, 2021
Source: the author's creation.

CONCLUSIONS

Based on the empirical analysis, the following conclusions can be drawn:
-Cooperatives in the Agricultural sector have greater cash receipts and are characterized by higher productivity compared to Manufacturing cooperatives. As for both sectors, there is a tendency to increase the income of net sales revenue and increase their productivity.
-The conducted empirical research proved the statement that cooperatives with more work experience realize higher productivity values. The statement is valid for both studied sectors – Agricultural sector and Manufacturing industry.
-Cooperatives from the Agricultural sector are developing more actively.
Among them, the most dynamic growth is observed in small cooperatives with 11-20 years of work experience, while in the Manufacturing industry, those with the highest growth are those that have already established themselves on the market and have been managing their activities for more than 20 years.

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REFERENCES

[1]Atanassova-Kalaydzhieva, T., 2023, Cooperative models of doing business and their role in farming community development. Trakia Journal of Sciences, 21(1), 129-134.
[2]European Commission, NACE Rev. 2, 2008, Statistical classification of economic activities in the European Community, https://ec.europa.eu/eurostat/documents/3859598/5902521/KS-RA-07-015-EN.PDF, Accessed on 04.02.2024.
[3]Hill, R. V., Maruyama, E., Olapade, M., Frölich, M., 2021, Strengthening producer organizations to increase market access of smallholder farmers in Uganda. Agricultural and Resource Economics Review, 50, 436–464.
[4]Hoken, H., Su, Q., 2018, Measuring the effect of agricultural cooperatives on household income: Case study of a rice producing cooperative in China. Agribusiness, 34(4), 831–846.
[5]Kašparová, K., Svoboda, R., Severová, L., Hinke, J., 2019, Evaluation of the performance of Czech agriculture. Indian Journal of Agricultural Research. 53: 522-528.
[6]Law on Small and Medium-Sized Enterprises, Art. 3, para. 1-3 (promulgated SG No. 66/1August 2023, as amended and supplemented. Bulgaria.

[7]Li, X., Ito, J., 2024, Multiple roles of agricultural cooperatives in improving farm technical efficiency: A case study of rural Gansu, China. Agribusiness. DOI:10.1002/agr.21901
[8]Lin, B., Wang, X., Jin, S., Yang, W., Li, H., 2022, Impacts of cooperative membership on rice productivity: Evidence from China. World Development, 150, 105669.
[9]Ma, W., Abdulai, A., Goetz, R., 2018, Agricultural cooperatives and investment in organic soil amendments and chemical fertilizer in China. American Journal of Agricultural Economics, 100(2), 502–520.
[10]Michalek, J., Ciaian, P., Pokrivcak, J., 2018, The impact of producer organizations on farm performance: The case study of large farms from Slovakia. Food Policy, 75, 80–92.
[11]Ohunyeye, O.F., Obamen, J., Omonona, S., Agbaeze, K.E., 2020, Effect of Economic and Agricultural Diversification on the Economic Growth in Nigeria, Agricultural Science Digest. 40: 34-38.
[12]Rachana, P., Vineel, B., 2019, Impact of rural entrepreneurship on migration- A case study of Dahanu (Maharashtra), India. Indian Journal of Agricultural Research. 53: 500-503.
[13]Semou, V., Sergaki, P., Tremma, O., 2022, The importance of the role of agricultural cooperatives in the development of the agricultural sector: the case of Greece. Indian Journal of Agricultural Research, 56(4), 496-501.
[14]Stoyancheva, D., Stoyanova, D., 2019, Growth and innovation activity of agricultural and food processing firms in Bulgaria. Economic and Social Development: Book of Proceedings, 1312-1320.
[15]Turlakova, T., 2023, Building cooperative business models in agriculture. Trakia Journal of Sciences, 21(1), 20-24.
[16]Verhofstadt, E., Maertens, M., 2014, Smallholder cooperatives and agricultural performance in Rwanda: Do organizational differences matter? Agricultural Economics, 45(S1), 39–52.
[17]Zhang, S., Sun, Z., Ma, W., Valentinov, V., 2020, The effect of cooperative membership on agricultural technology adoption in Sichuan, China. China Economic Review, 62, 101334.