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*Original Paper*

## **Evaluation of economic results of agricultural enterprises in the Nitra region**

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### **ABSTRACT**

The paper deals with the economic analysis of agricultural enterprises in the Nitra region in the years 2017-2021. The agricultural sector is undergoing extensive changes in terms of size, production structure, and business activities. The main objective of enterprises is to make a profit. In economics, profit is the difference between revenue earned and costs incurred, and it is generated if revenue exceeds costs. The paper's main objective is to analyse the development of agricultural cooperatives in the Nitra region for the period 2017 - 2021. From the economic point of view, we have analysed the costs, revenues and EBT, and quantified the profitability indicators of costs and revenues. The cost profitability indicator follows the revenue profitability indicator. The agricultural cooperatives achieved a profit before tax (EBT) in each of the years analysed, which positively affected the indicators. The individual years were compared using a z-test and when comparing the years (2017, 2019), (2017, 2020) and (2018, 2020), a statistically significant difference in the economic results was found.

**KEYWORDS:** agricultural enterprises, earnings before taxes, profitability, profitability indicator

**JEL CLASSIFICATION:** M20, M21, O13

### **INTRODUCTION**

The ability to produce enough food of high quality depends on the form of agriculture, one of the oldest human economic activities. Pekárová (2021) argues that a major turning point occurred in the 20th century when agriculture turned into an industry with a drive to minimize costs and maximize profits. Chrastinová, Belešová, and Jenčíková (2019) say that in Slovakia, predominantly rural areas dominate, with agriculture and production output linked to it.

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According to another Farm Structure Survey, there were 25, 658 farms of legal and natural persons in Slovakia, which manage 1, 889, 819 ha of utilized agricultural land. The average size of farms in Slovakia is 73.65 ha for all subjects. Szabo and Grznár (2015) specify the problem in Slovak agriculture. Slovak agriculture ranks in the last but one seventh and in comparison, with the advanced countries, it shows a low input of fixed assets, intermediate products, and land livestock units, but also a lower volume of the provided subsidies than the advanced countries. Slovak agriculture does not use its competitive advantages, which mainly involve the size of businesses, the economies of scale and labour productivity.

Agricultural enterprises are integral to agricultural modernization, serving as a bridge between scattered small-scale farmers and modern markets (Lu, Chen, 2021). The role of small farms in agricultural production is particularly important for less developed economies, with a high share of agriculture in GDP and a lower level of national income. These economies have a high share of small-scale farms in the total number of registered farms measured by the size of an agricultural holding (Ristanović et al., 2022).

Cost monitoring and analysis are the basic prerequisites for the good financial management of each company. Firstly, they are based on the determination of an appropriate cost structure (either by a generic or purpose-defined classification), as well as the determination of an optimum cost amount and, last but not least, the monitoring of their effectiveness. An average farm in the EU achieved increasing cost-effectiveness with profit gains (Svoboda, Lososová, Zdeněk, 2020). The profit/loss is a summary and traditional indicator evaluating the effectiveness (profitability). In the agricultural sector, it is its amount significantly affected by natural and climatic conditions affecting both crop and livestock production. Novotná and Svoboda (2014) analysed operating income, which is generated from the core business enterprises, should be ranging in positive terms – thus achieving a profit could fulfil a sense of their activities.

Edwards and Duffy (2014) describe profitability. Profitability is the degree to which the value of a farm's production exceeds the cost of the resources used to produce it. An absolute measure of profitability is net farm income. A positive profit means that the farm has produced crops and livestock that have a greater value than the seed, fertilizer, fuel, labour, feed and other inputs that were used up in their production.

Tóth (2021) dealt with the profitability of farms with different types of production. The profitability of farms with predominantly crop production is higher than the profitability of farms with predominantly livestock production. Production is closely linked and therefore the trends are similar. A comparison of farms in Slovakia shows that specialised farms are more profitable than less specialised farms; the highest profit per hectare and the highest revenue per employee are achieved by pure crop farms.

## **MATERIAL AND METHODS**

The basis for the processing of the paper was data from the accounting statement and profit and loss statement of agricultural cooperatives operating in the Nitra region. The monitored period was the years 2017 - 2021. In total, we evaluated 47 agricultural cooperatives. From the economic point of view, we focused on the analysis of the development of costs, revenues, and earnings before taxes. The indicators as return on costs and return on revenues were quantified, the minimum and maximum values achieved, and the mean values and variances

calculated. To evaluate the overall development, we used the calculation of change and index. Table 1 shows the results of the management of farms in the Nitra region.

We use the statistical z-test to evaluate the data. Z-test is the statistical test, which the distribution of the test statistic under the null hypothesis can be approximated by a normal distribution. The Z-test has any critical value (for example, 1.96 for 5% two tailed). Kieser (2020) described the z-test in his book and compared the z-test with other statistical tests. With the z-test for two independent samples, the expectations of a normally distributed outcome with known variance can be compared between two groups.

**RESULTS AND DISCUSSION**

The territory of Slovakia is divided into better and worse natural conditions based on its climatic conditions. The Nitra region is one of the regions located in the southern part of Slovakia with favourable conditions for the development of agricultural production. This region has a long tradition of agriculture. Legal entities have a decisive share of agricultural holdings. In many economic indicators, there are significant differences between commercial companies and agricultural cooperatives.

Table 1 shows the development of costs, revenues and profit before tax (EBT) in agricultural cooperatives in the Nitra region. As can be seen from the table, by 2021, compared to 2017, the value of all three indicators has increased (revenues by 18.7%, costs by 13.1%, EBT by 3.6 times). Revenues produced followed the cost incurred in an inverse relationship. The values of all three indicators increased in the last two years during the COVID-19 pandemic period, compared to 2019. In terms of individual activities, the economic area (operating activities) outweighs the financial area (financial activities) in terms of costs and revenues. The most significant revenue item is sales. Revenues exceeded costs every year, with agricultural cooperatives reporting EBT reaching its highest value in 2021 at €293,572.

**Table 1** Development of costs, revenues and EBT in agricultural cooperatives in Nitra County

Indicator/year	2017	2018	2019	2020	2021	21-17	21/17
Revenues	3,597,690	3,657,213	3,548,846	3,606,915	4,271,558	673,868	1.187
Costs	3,516,041	3 541,188	3,515,801	3,555,251	3,977,986	461,944	1.131
EBT	81,649	116,025	33,045	51,664	293,572	211,924	3.596

Source: own calculation, *Profit and loss statements of agricultural companies*

On the basis of the indicators listed in Table 2, we quantified profitability indicators. The indicators speak about the efficiency of the company's activity. They translate the reported economic result to an item. Table 2 shows the development of Return on revenues. The indicator tells how many € EBT the agricultural cooperatives produced per € 1 of revenue. The lowest value of revenue and EBT was reported in 2019, which logically translated into the lowest value of return on revenue. There were 9.3 € of EBT per 1,000 € of revenue. Logically, the highest value was in 2021, when €68.7 EBT per €1,000 of revenue was generated. Profitability increased over the whole period under review and reached the required positive level. The average value of profitability showed a fluctuating trend, but an increasing trend until 2021 compared to the required 2017. The lowest minimum value of the indicator was reached in 2021 when 759.1 € of loss per 1,000 € of revenue was achieved. The highest maximum value was also reached in 2021, with €442.2 EBT per €1,000 of revenue.

Of the set of agricultural cooperatives analysed, the number of enterprises with positive profitability outweighed the number of enterprises with negative profitability. In 2021, as many as 45 agricultural cooperatives in the set had a positive return on revenue.

**Table 2** Development of return on revenues in agricultural cooperatives in Nitra County

Indicator/year	2017	2018	2019	2020	2021	21-17	21/17
Return on Revenues (ROV)	0.0227	0.0317	0.0093	0.0143	0.0687	0.0460	3.0283
Average	0.0209	0.0475	0.0074	0.0095	0.0762	0.0552	3.6389
Min	-0.2983	-0.0588	-0.1357	-0.2704	-0.7591	-0.4608	2.5451
Max	0.2056	0.2489	0.2011	0.1877	0.4422	0.2367	2.1511
Variance	0.0058	0.0041	0.0037	0.0065	0.0243	0.0185	4.1642
Number of businesses with positive ROV	40	43	32	34	45	5	1.1250
Number of businesses with negative ROV	7	4	15	13	2	-5	0.2857

Source: own calculation

Table 3 shows the development of the Return on costs indicator in agricultural cooperatives in the Nitra region. Return on costs shows how much € EBT generated from each euro spent. The lowest return on costs was in 2019 when €9.4 EBT was generated per €1,000 spent. The value of return on costs increased by 0.0506 i.e., 5.06% by 2021. The average value of the indicator had an increasing trend until 2021 compared to 2017. In 2021, the lowest minimum value of cost profitability was achieved with a loss of €431.5 per €1,000 of cost; in this year, the highest maximum value was achieved with €792.9 EBT per €1,000 of cost. There was the same number of enterprises with positive profitability as for the profitability of revenues, except for 2020, so enterprises that achieved positive profitability of costs also prevailed over those that did not.

**Table 3** Development of return on costs in agricultural cooperatives in Nitra County

Indicator/year	2017	2018	2019	2020	2021	21-17	21/17
Return on Costs (ROC)	0.0232	0.0328	0.0094	0.0145	0.0738	0.0506	3.1780
Average	0.0274	0.0552	0.0114	0.0159	0.1078	0.0804	3.9401
Min	-0.2297	-0.0555	-0.1195	-0.2128	-0.4315	-0.2018	1.8783
Max	0.2588	0.3313	0.2518	0.2311	0.7929	0.5341	3.0638
Variance	0.0061	0.0063	0.0043	0.0062	0.0274	0.0213	4.5152
Number of companies with positive ROC	40	43	32	35	45	5	1.1250
Number of companies with negative ROC	7	4	15	12	2	-5	0.2857

Source: own calculation

The data will be processed using mathematical statistics methods. To compare farm performance from 2017-2021, we used the values presented in the accounting statement and profit and loss statement of agricultural cooperatives operating in the Nitra region.

Based on this, the objectives of the research were set:

- to verify whether the management results in 2017-2021 are significantly different,
- to identify the differences between the districts of the Nitra region.

Based on theoretical knowledge of economic practice, statistical hypotheses were developed. We will test the hypothesis:

H0: The difference in economic results in 2017-2021 is not statistically significant.

H1: There is a statistically significant difference in agriculture farm performance in 2017-2021.

For comparing the years (2017, 2019), (2017, 2020) and (2018, 2020), a statistically significant difference in the economic results was found.

## CONCLUSIONS

Commercial companies and agricultural cooperatives are dominant among enterprises operating in the agricultural sector. Both legal forms are represented in the Nitra region, which has a long tradition in this sector. Through its common agricultural policy (CAP), the EU supports farmers, ensures adequate incomes, improves agricultural productivity, preserves rural areas, and promotes rural jobs. In many cases, farms would be losing money if subsidies weren't available. Rábek (2022) et al. report that the supported farms proved lower profitability. Statistically significant difference (at the 90% confidence level) was only in return on equity. It is evident that agricultural cooperatives showed EBT during the period under review (2017-2021), which is reflected in the positive values of cost and revenue profitability indicators. The research confirmed that the Covid 19 pandemic caused a significant decrease in total returns in 2020 compared to 2017 and 2018.

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