

## Performance Measurement and Characterization of Financial Indicators of Agricultural Companies in Romania

Maria Petronela Aron  
Wets University of Timisoara, Romania  
[maria.aron94@e-uvvt.ro](mailto:maria.aron94@e-uvvt.ro)

### Abstract

*The performance consists of the efficiency and effectiveness with which the resources are consumed. The results are generated to ensure the development of the sphere of interest of the organization. The financial indicators provide a fundamental basis for analyzing the performance and evaluating the company's financial health. The paper's objective is to identify the characteristics of agricultural companies in terms of financial indicators. The indicators used in this paper are Accounting Value and financial indicators: Return on Assets (ROA), Return on Equity (ROE) and Return on Sales (ROS). We conducted qualitative research using descriptive analysis, correlation matrix and covariance analysis. The sample consists of 203 agriculture companies with more than 5,000,000 lei turnover in 2018-2020. The data were analyzed from the financial reports. The predominant activity was cultivation of cereals (excluding rice), leguminous plants and oilseed plants, with 181 companies. There was a positive correlation between all the analyzed indicators. The closest correlation was between ROA with ROE and ROS, and ROE with ROS, and the lowest coefficients were between AV and financial performance indicators.*

**Key words:** Accounting value, Agriculture, financial indicators, performance

**J.E.L. classification:** M41, L25, Q10

### 1. Introduction

The Romanian rural territory has a significant agricultural potential due to the available natural resources, so that Romania represents 7% of the utilized agricultural area of the European Union, occupying the sixth place. There is the most significant number of small farms in Romania and a low degree of technology (Bumbescu, 2020a, p. 120). Because in Romania, companies operating in agriculture are mainly small and medium-sized, they are not listed on the stock exchange.

However, external users of financial information need to determine the company's carrying amount or profitability to decide on the provision of goods or services or investing in such a company. In this research, we will identify the correlation between the profitability rates of agricultural companies and the book value of these companies. The rates of return on Return of Assets (ROA), Return on Equity (ROE) and Return on Sales (ROS) are calculated using data obtained from website datagov.ro related to the financial statements submitted by companies for the period 2018-2020.

Given the importance of this topic, the paper's objective is to study the characteristics of Romanian agricultural companies and the calculation of their financial performance indicators to perform a descriptive analysis and determine the correlation of these indicators. We decided to focus our research on Romanian companies because the Romanian rural territory has significant agricultural potential.

The methodology applied for analysis consists in grouping of data by turnover (sales), development regions, by field of activity. There will also be a descriptive analysis, a correlation matrix and covariance analysis. The originality of the research consists of a comprehensive study of Romanian agricultural companies and their financial performance. The study will contribute to the literature by analyzing the characteristics of Romanian agricultural companies and the indicators of their financial performance for the period 2018-2020.

The remaining paper is structured as follows: a theoretical background is made in the second section, followed by the applied methodology and the results obtained. The last section includes the conclusions, limitations, and future research directions.

## 2. Theoretical background

The performance represents a state of competitiveness of the organization that determines the achievement of results due to the achievement of strategic objectives, and on the other hand, ensures sustainable maintenance on the market (Jianu, 2007, p. 60). The performance evaluation indicators reflect the degree of capitalization of available resources to achieve the desired/planned results (Bumbescu, 2020a, p.119). The organizations' annual financial reports facilitate monitoring and evaluation of the performance with the help of financial indicators (Burja, 2015, p.85). The indicators which we used in this paper are ROA, ROE and ROS.

ROA highlights how much profit an organization makes from the investments in its assets, and it is calculated as the ratio between the net income and the total assets held by an entity (Bumbescu, 2020b, p. 120). ROA is considered the most comprehensive performance measurement indicator because it combines efficiency and effectiveness measurement (Courtis, 2003, p.20). ROE is one of the essential performances assessment indicators because it allows the general performance evaluation of the organization to be managed, and ROE is calculated as the ratio between net profit and equity. ROE measures the profitability of an organization, highlighting how much profit a company generates through the money invested by the shareholders (Bumbescu, 2020b, p. 25). ROS, the company's ratio, can achieve a profit from the sale of activities undertaken (Manoppo, 2015, p. 691).

AV represents the total value of the company's assets that the shareholders would theoretically receive if a company were liquidated. Compared to the company's market value, the carrying amount may indicate whether the shares of a listed company are overvalued or undervalued.

Previous research such as Nugroho (2001, p. 100), Rinanti (2009, p. 87) and Patriawan (2011, p. 115) examined the effect of the financial performance of the stock price of companies listed on the various stock exchanges. All studies have shown that the variables ROA, ROE, and ROS significantly impact the stock price (Manoppo, 2015, p. 692). Our research is focused on Romanian non-listed companies from agriculture.

## 3. Research methodology

To achieve the proposed objective, to study the characteristics of the companies from Romanian agriculture, we selected the relevant financial indicators based on the availability of data and the literature. The empirical research was qualitative. The field of agriculture includes both the plant sector and the livestock sector (Aron, 2019, p. 94). In our research, we analyzed the vegetable sector, characterized by the following NACE activity codes: 011 " Growing of non-perennial crops", 012 " Growing of perennial crops", 013,,Plants propagation”.

Research objectives are to describe the ROA, ROE, ROS and AV indicators from the years 2018, 2019 and 2020 distributed on the development regions of Romania, as well as to identified the correlations between ROA, ROE and ROS on the accounting value of companies. This research is a causal type of research and uses descriptive analysis. We presented the description of the analyzed indicators in table no 1.

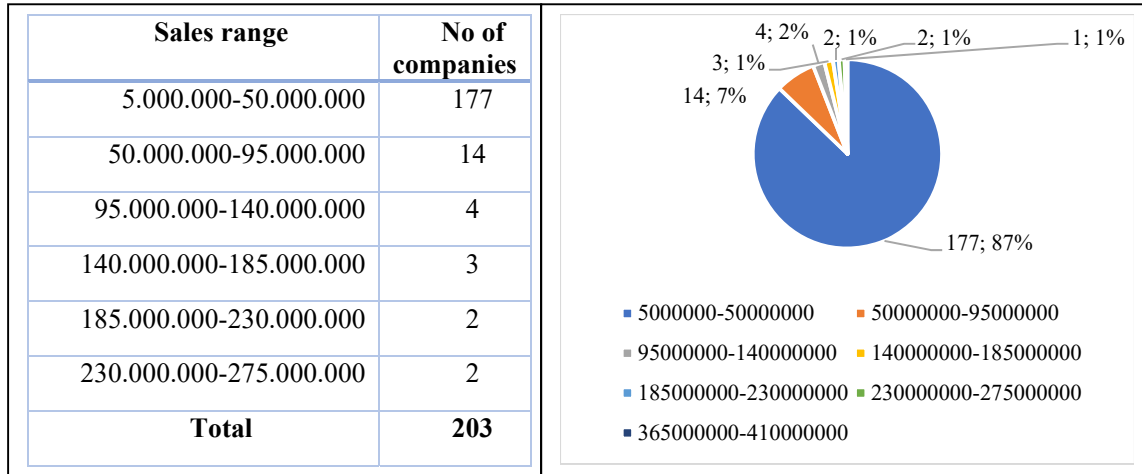
*Table no 1. Description of the variables*

<b>Variables</b>	<b>Code</b>	<b>Description</b>	<b>Source</b>
Return on equity	ROE	Net income/shareholders equity	Financial statements 2018-2020
Return on assets	ROA	Net income/assets	Financial statements 2018-2020
Return on sales	ROS	Net income/sales	Financial statements 2018-2020
Accounting value	AV	Equity	Financial statements 2018-2020

*Source:* Author's own work

We analyze the data from the financial reports from 2018, 2019 and 2020 of 203 companies. In the three years of analysis, the selected companies had a turnover of more than 5,000,000 lei (approx. 1.000.000 euro). According to national legislation, companies with a turnover below the 10,000,000 euro (approx. 50.000.000 lei) ceiling are small and medium-sized. In figure no 1, we will present the structure of the companies studied according to the average turnover obtained in the years of analysis.

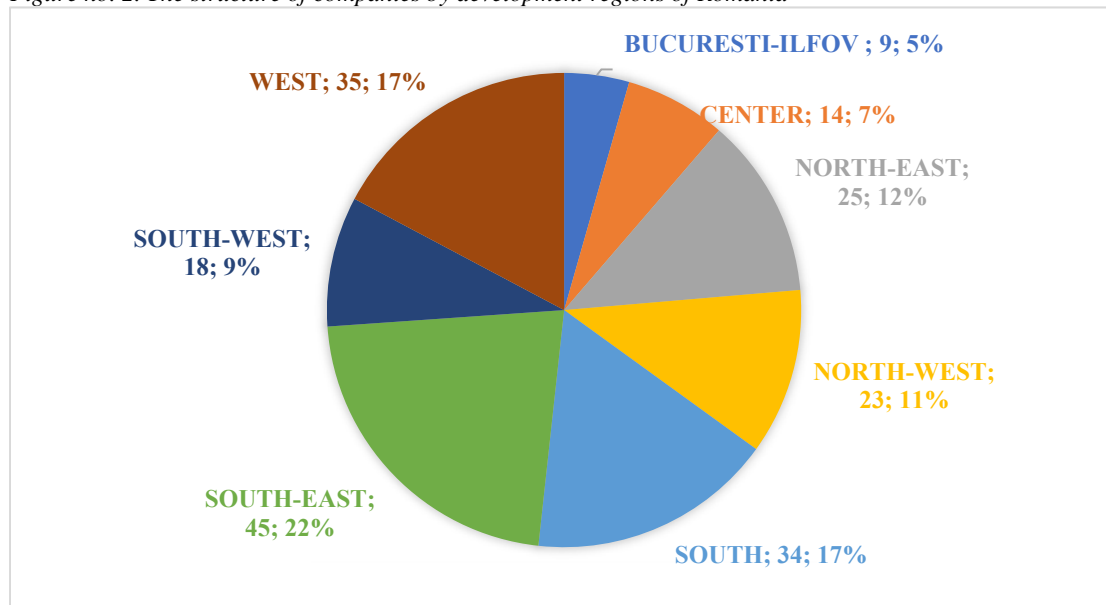
Figure no. 1. Structure companies about sales range



Source : author's views based on datagov.ro data with Excel

Figure 1 shows that the Romanian agricultural companies are small and medium in proportion 87%. Large companies proportion 13% of the total companies analyzed. The two largest companies analyzed are SCHWAB AGRO PROD SRL from Satu Mare and AGRICOST S.A. from Braila. The structure of companies by development regions of Romania is presented in the following figure.

Figure no. 2. The structure of companies by development regions of Romania

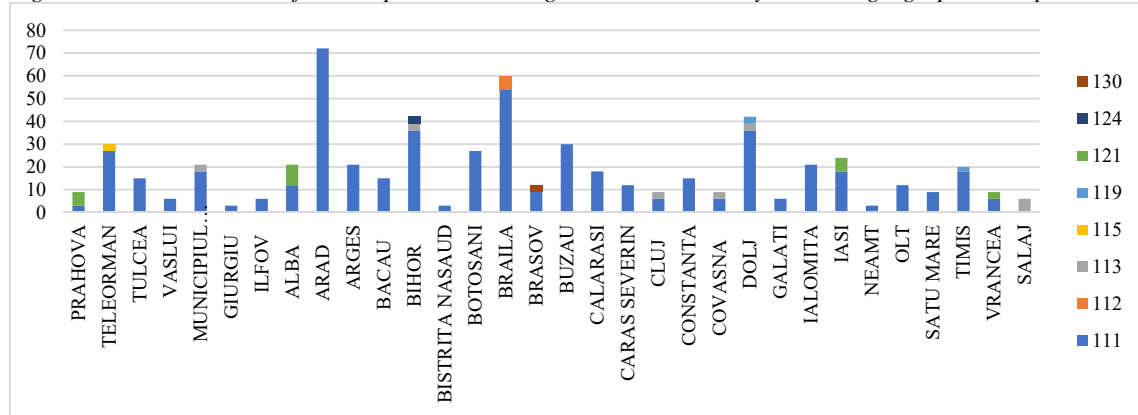


Source: author's views based on datagov.ro data with Excel

From the figure 2, the most significant number of companies operating in agriculture is present in the regions Sud-Est with 45 companies, West with 35 companies and Sud with 34 companies. In the North-East regions, there were 25 companies, North-West has 23 companies, South-West has 18 companies, Center has 14, and Bucuresti-Ilfov region has 9 companies.

The structure of the companies according to the NACE activity code is presented in the figure 3.

Figure no. 3. The structure of the companies according to the NACE activity code and geographical dispersion



Source: author's views based on datagov.ro data with Excel

From figure no 3, it is observed that the predominant activity is activity code 0111 „Cultivation of cereals (excluding rice), leguminous plants and oilseed plants” with 181 companies located in the plain areas of Romania, respectively the counties Arad, Braila, Bihor and Dolj. The ranking is followed by activity code 0121 "Cultivation of grapes", with a number of 8 companies from Braila County.

#### 4. Findings

In order to achieve the established research objective, in the first stage, we will present table 2, an overview of the financial performance indicators of the studied companies, presenting their average on the development regions of Romania in the period 2018-2020. The data are presented in the table in the form of an arithmetic average of the values from 2018, 2019 and 2020 for each development region of Romania. This presentation was made using the Excel pivot table function.

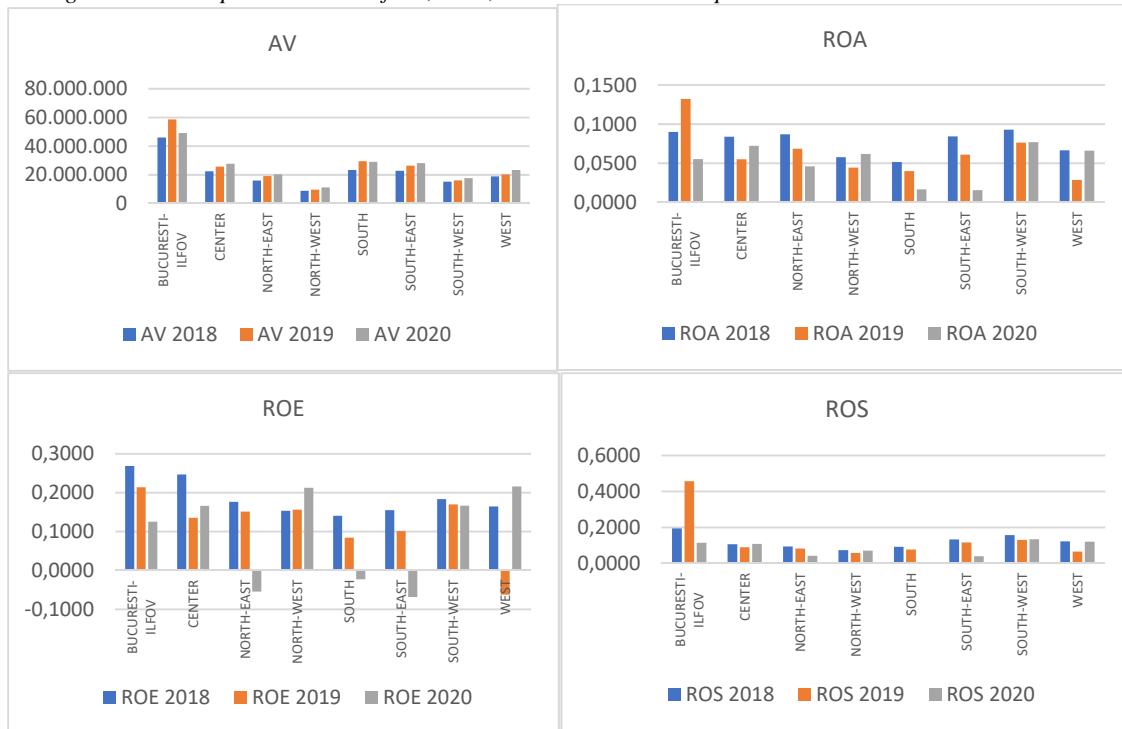
Table no. 2. Performance indicators on the development regions of Romania in the period 2018-2020

REGION	AV 2018	AV 2019	AV 2020	ROA 2018	ROA 2019	ROA 2020	ROE 2018	ROE 2019	ROE 2020	ROS 2018	ROS 2019	ROS 2020
BUCURESTI-ILFOV	46,111,744	58,640,298	49,178,214	0.0902	0.1322	0.0555	0.2690	0.2138	0.1255	0.1946	0.4571	0.1142
CENTER	22,449,400	25,636,644	27,651,075	0.0840	0.0552	0.0725	0.2468	0.1352	0.1661	0.1064	0.0902	0.1079
NORTH-EAST	16,018,404	19,186,142	20,297,104	0.0871	0.0687	0.0463	0.1763	0.1514	-0.0547	0.0938	0.0826	0.0420
NORTH-WEST	8,906,730	9,590,761	11,161,352	0.0579	0.0445	0.0619	0.1536	0.1564	0.2129	0.0741	0.0577	0.0707
SOUTH	23,425,513	29,563,372	29,062,820	0.0516	0.0402	0.0167	0.1407	0.0841	-0.0228	0.0921	0.0775	0.0038
SOUTH-EAST	22,861,561	26,432,041	28,203,658	0.0845	0.0611	0.0158	0.1550	0.1013	-0.0684	0.1333	0.1159	0.0393
SOUTH-WEST	15,149,328	16,159,561	17,736,848	0.0931	0.0766	0.0771	0.1836	0.1699	0.1665	0.1571	0.1308	0.1343
WEST	18,808,655	20,209,588	23,324,759	0.0666	0.0288	0.0663	0.1649	-0.0623	0.2162	0.1227	0.0658	0.1209
AVERAGE	21,716,417	25,677,301	25,826,979	0.0769	0.0634	0.0515	0.1862	0.1187	0.0927	0.1218	0.1347	0.0791

Source: author's views based on datagov.ro website

The information for table 2 highlights a significant difference between the years 2018 and 2020 for ROA, ROE and ROS. In 2020, a significant impact was generated by COVID 19 pandemic, with a lower net result among companies than in 2018 and 2019. These results are also represented by figure 4.

Figure no. 4. Graphic evolution of AV, ROA, ROE and ROS in the period 2018-2020



Source: author's views based on datagov.ro data with Excel

Figure 4 presents the graphic evolution of AV, ROA, ROE, and ROS in 2018-2020. It is observed that accounting value (AV) does not show a significant evolution, constant in the three years where we can conclude that agricultural companies have not undergone significant changes on the components of equity (current result, share capital, carried forward, reserves, etc.).

However, the profitability rates (ROA, ROE and ROS) have an oscillating evolution, these suffering a significant decrease in 2020 compared to 2018 in all development regions of Romania. This decrease is also due to the epidemiological situation in Romania generated by the covid pandemic 19 and other factors such as unfavorable weather conditions (rains or floods). The empirical research continued with the descriptive statistics of the analyzed indicators, presented in table 3.

Table no. 3. Descriptive statistics by performance indicators in the period 2018-2020

	AV	ROA	ROE	ROS
Mean	23,024,149	0.0583	0.1120	0.0969
Standard Error	1,802,717	0.0035	0.0172	0.0081
Median	11,135,477	0.0450	0.1217	0.0680
Standard Deviation	44,487,311	0.0852	0.4246	0.1991
Sample Variance	1,979,120,796,002,210	0.0073	0.1803	0.0396
Kurtosis	60	8.5424	82.4572	122.1588
Skewness	7	0.9954	-5.3225	7.2308
Range	575,770,339	1.0183	9.0365	4.1450
Minimum	-19,394,167	-0.3277	-5.6177	-0.7649
Maximum	556,376,172	0.6907	3.4189	3.3802
Sum	14,021,706,507	35.4803	68.1805	59.0206
Count	609	609	609	609
Confidence Level (95.0%)	3,540,308	0.0068	0.0338	0.0158

Source: author's views based on datagov.ro website

From table 3, the mean of AV is 23.024.149 lei (approx. 4.600.000 euro), which means that the average book value of the analyzed companies is 4.600.000 euro. The mean of ROA is 0,0583, which means that, on average, investments in the company's assets generate a return of 5% per year. The mean of ROE is 0,1120, which means that on average, and mean of ROS is 0,0969. Median represents splits our data in half. The median of AV is 11.135.477, the median of ROA is 0,0450, the median of ROE is 0,1217, the median of ROS is 0,0680. At this point, our data is split in half.

We analyzed the degree of correlation of the indicators both with AV and with themselves. This analysis is presented in table 4. If the correlation index is more significant than 0.25, we have a correlation relationship. In order to correlate the financial indicators, we considered it necessary to recalculate the accounting value because it was presented in absolute values and ROA, ROE and ROS are represented in percentage values between 0 and 1. In order to recalculate the accounting value we used the logarithmic function (lnx).

*Table no. 4. Correlation analysis by performance indicators in the period 2018-2020*

	AV	ROA	ROE	ROS
AV	1			
ROA	0.0713	1		
ROE	0.0044	0.5667	1	
ROS	0.1638	0.7563	0.3860	1

*Source:* author's views based on datagov.ro data with Excel

There is a positive and a stronger correlation between ROA with ROE, ROS and a positive and moderate correlation between ROE and ROS based on data presented in table 4. Unfortunately, the correlation coefficients between AV and financial performance indicators are very low, the highest value being at ROS.

We analyzed the degree of covariance of the indicators and the results are presented in table 5.

*Table no. 5. Covariance analysis by performance indicators in the period 2018-2020*

	ROA	ROE	ROS	AV
ROA	0.0073			
ROE	0.0205	0.1800		
ROS	0.0128	0.0326	0.0396	
AV	0.0137	0.0020	0.0565	1.5045

*Source:* author's views based on datagov.ro data with Excel

According to table 5, when we analyzed the degree of covariance of the indicators, we can observe the kind of connection created between the studied variables.

## 5. Conclusions

This paper presented the characteristics of the agricultural companies in Romania on a sample of companies based in Romania with revenues of more than EUR 1 million in the period 2018-2020 and with at least three years of experience. We will analyze the correlation between the profitability rates of agricultural companies and the book value of these companies. The rates Return of Assets (ROA), Return on Equity (ROE) and Return on Sales (ROS) were calculated using data obtained from datagov.ro website related to the financial statements submitted by companies for 2018, 2019 and 2020.

The research objective was to describe the ROA, ROE, ROS and AV indicators from the years 2018, 2019 and 2020 distributed on the development regions of Romania, as well as to analyze the significant influence of ROA, ROE and ROS on the accounting value of companies.

We analyze the data from the financial reports from 2018, 2019 and 2020 of 203 companies that had a turnover of more than 5,000,000 lei. The predominant activity is code 0111 „Cultivation of cereals (excluding rice), leguminous plants and oilseed plants”, with 181 companies.

A positive correlation was found between the analyzed indicators. The strongest correlation was between the indicators ROA with ROE and ROS, and the lowest correlation coefficient was identified between AV and ROE. One explanation would be that the variables are mainly influenced by internal factors of the companies.

Our research contribution is represented by collecting data and synthesizing them from the last three years. The research limitation consisted of qualitative analysis, but it is necessary to continue quantitative research. Future research can be oriented to study the relationship of the performance indicators and test and validate some hypotheses to achieve an econometric regression model.

## 6. References

- Anghelace, C., 2009, Econometrie. Teorie, sinteze și studii de caz [*Econometrics. Theory, synthesis and case studies*], Bucharest: Artiflex Publishing House
- Aron, M.P., Cuc, L., Lile, R., 2019, Convergences and divergences between the job of the accountant and the one of the agronomist engineer, *Scientific Papers Series I, Vol. 21 Issue 2*, available at: <http://lsma.ro/index.php/lsma/article/view/1580>, [accessed 15.11.2021]
- Bumbescu, S.S., 2020a, Performance analysis in agriculture using data envelopment analysis, *ECONFORUM, VOL. 9, Issue 3*, available at: <http://www.ecoforumjournal.ro/index.php/eco/article/view/1125>, [accessed 20.11.2021]
- Bumbescu, S.S., 2020b, Analysis of economic performance in agriculture using econometric modeling, *Studia Universitatis Vasile Goldis Arad, Economics Series, Vol 30*, available at: <https://www.proquest.com/openview/b08059de22396f711d669b6efcd591b1/1?pq-origsite=gscholar&cbl=2006335> , [accessed 18.11.2021]
- Burja, C., 2015, The financial performance of agricultural holdings in Romania-regional analysis, *Annales Universitatis Apulensis Series Oeconomica*, available at: <http://www.journals.uab.ro/index.php/oeconomica/article/view/216> > , [accessed 15.11.2021]
- Courtis, P., 2003, DuPont Ratio: A comprehensive measure of business performance, *European Research Studies, Vol. VI*, available at: [https://www.researchgate.net/publication/46542499\\_DU\\_PONT\\_Ratio\\_A\\_comprehensive\\_measure\\_of\\_business\\_performance](https://www.researchgate.net/publication/46542499_DU_PONT_Ratio_A_comprehensive_measure_of_business_performance) > , [accessed 25.11.2021]
- Jianu, I., 2007, Evaluarea, prezentarea și analiza performanței întreprinderii. O abordare din premisele Standardelor Internaționale de Raportare Financiară [*Evaluation, presentation and analysis of enterprise performance. An approach based on the premises of the International Financial Reporting Standards*], Bucharest: CECCAR Publishing House
- Manoppo, C. P., 2015, The influence of ROA, ROE, ROS and EPS on stock price, *Jurnal EMBA: Jurnal Riset Ekonomi, Manajemen, Bisnis dan Akuntansi, Vol. 3 No. 4* available at: <https://ejournal.unsrat.ac.id/index.php/emba/article/view/11493> > , [accessed 25.11.2021]
- Nugroho, B.A., 2001, *Strategi Jitu Memilih Metode Statistic Penelitian*, available at: <https://openlibrary.telkomuniversity.ac.id/pustaka/6991/strategi-jitu-memilih-metode-statistik-penelitian-dengan-spss.html>>, [accessed 20.11.2021]
- Rinanti, I., 2009, Pengaruh Net Profit NPM, ROA, ROE Terhadap Harga Saam Pada Perusahaan Tercantum Dalam Indesk LQ 45, available at: <https://ojs.unud.ac.id/index.php/Akuntansi/article/view/56530>> , [accessed 20.11.2021]
- <https://data.gov.ro/dataset> >, [accessed 15.11.2021]