# MEASURING FINANCIAL PERFORMANCE: FINANCIAL RATIOS VS. ECONOMIC VALUE ADDED

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## Abstract

*The study presents a model of comparative analysis of financial performance based on two categories of instruments and evaluates the interdependencies between different performance measures. Based on the information gathered from secondary sources, we determined, interpreted and dynamically analysed the following indicators: return on assets, return on equity, degree of global indebtedness, current and quick liquidity and economic added value. The obtained results allowed the shaping of two performance profiles on the basis of which the ranking of the analysed companies was made. In order to identify the interdependencies between the different performance measures, we performed a first regression analysis which indicated that the company's ability to create added economic value depends on achieving high rates of economic profitability. Because in the analysed period there were major variations of the macroeconomic indicators, we performed a second regression analysis which indicated that the economic growth rate positively influences the two rates of return.*

*Keywords:* financial performance, ratios, economic value added, companies

## Introduction

The study is based on the premise that the success of a business depends both on the quality of methods, techniques and tools for measuring performance, and on the skills of managers to implement the most appropriate methods. Summarizing the results of previous research, we have identified evidence that a fair assessment of organizational performance (reflecting the interests of all interested parties) depends on the quality and usefulness of the system of indicators used. Rajnoha *et al*. (2016)

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ISBN 978-606-714-619-6 | ISSN 2393-2384 | ISSN-L 2392-8867

pointed out that the use of certain methods, techniques and measuring instruments allows to achieve superior performance. Afonina (2015) showed that there is a significant positive relationship between the quality of the tools and techniques of management used and organizational performance. Other studies have found that the use of different business valuation methods depends on management structure (Suriyankietkaew and Avery, 2016; Dobija and Kravchenko, 2017), shareholder structure (Liu *et al*., 2019) and business size (Lee, 2009).

From a practical point of view, one of the challenges of performance management is the selection of the system of indicator that underlie the measurement and evaluation of performance. The use of simple indicators does not provide a complete picture of performance, which requires the use of more complex indicators. Due to changes in the business environment, as well as changes in organizational objectives, some indicators have limited "validity". Last but not least, the indicators can be interpreted differently by the interested parties. For example, an indicator that measures a company's indebtedness (used to assess the impact of the financing structure on financial performance) may be considered valuable by managers, but less valuable by shareholders, who see it as a measure of the risk of sharing profits with external financiers.

This article represents a starting point of a broader research that aims to assess the usefulness and significance of the various indicators used to measure corporate performance. Specifically, we consider two categories of indicators for assessing financial performance - ROA and ROE, respectively, economic added value. The element of originality assumed by the authors is the analysis of the extent to which the variations of the first two performance indicators have an impact on the variations of the third performance indicator. From what is known by the authors, such a research direction has not been addressed so far (at least at the level of performance analysis of Romanian companies).

To complete the knowledge framework, the analysis of the interdependencies between the selected performance indicators also includes the use of three complementary variables (global indebtedness, current ratio and quick ratio) and a control variable (firm size). Then, to transcend beyond the analysis at corporate level, the performance analysis is extended by taking into account the real impact of GDP growth rate on the targeted performance indicators. Therefore, this study presents the peculiarities of measuring financial performance based on financial ratios and added value and assesses the interdependencies between different performance measures. In developing the study, we aimed for research to have a dual use: scientific (by providing an overview of the state of knowledge in the field) and practical (by providing practical clues to facilitate the selection and use of various measures to assess performance).

## 1. Review of the literature on measuring financial performance

The first performance measurement systems were based on financial rates, defined as the expression of the ratios between two quantities (Kieso *et al*., 2013). Through the easy way of determining (but also due to the ease of interpretation), financial rates have been and are considered valuable tools that allow measuring and monitoring the performance of a company (Babalola and Abiola, 2013). At the same time, the rates were considered useful tools underlying the adoption of investment decisions. The argument on which this idea was built was that rates "offer investors a more complete measure of performance" (Demmer, 2015).

Summarizing the incipient research, Salmi *et al*. (1990) identified three approaches to the classification of financial ratios:

a) a *pragmatic* approach in which the classification was based on established practices and personal opinions of financial analysts;

b) a *deductive* approach, focused on the technical relations between the different financial rates (later applied in the Du Pont model) and on the observed statistical behaviour;

c) an *inductive* approach, which classifies rates from the perspective of statistical techniques (such as factor analysis) and of empirical utility; the purpose of this approach was threefold: to eliminate mutually exclusive financial rates from the analysis; ensuring the spatial and temporal representativeness of the results; increasing the degree of coverage, respectively, evaluating the extent to which the selected rates can characterize all the activities of the organization.

In the literature but also in financial practice have been identified and used a series of rates (tables 1) that can be grouped as follows: *rates of return*, which describe the extent to which the use of resources (means) of a company generates profit; *financial leverage ratios*, which show the extent to which the use of borrowed funds has led to an increase in the return on equity; *liquidity rates*, which show whether a company has enough assets to pay off short-term debt; *efficiency rates*, which allow the assessment of the company's ability to manage its assets. There are relationships of mutual interdependence between the categories of rates listed. For example, rates of return on assets (ROA), equity (ROE) and investments (ROI) are dependent on liquidity rates (current and immediate) (Pal, 2015). On the other hand, holding liquid assets can improve profitability for a certain period of time.

Due to the generous possibilities for determining the rates, the researchers resorted to factor analyses following the correlation between the variables (Ugurlu and Aksoy, 2006; De *et al*., 2011; Chen, 2011); the aim was to select the most representative rates starting from the most representative determinants of financial performance. There are other research directions aimed at: a) financial rates that satisfy the condition of proportionality with the size of the company (Sudarsanam and Taffler, 1995); b) the possibilities of adjusting financial rates (Gallizo and Salvador, 2003); c) the longitudinal properties of financial rates (McLeay and Stevenson, 2009).

The use of rates for measuring and evaluating financial performance has been criticized because: a) it evaluates performance at a given time (using historical information); b) promotes short-term decision to the detriment of strategic orientation (Bourne *et al*., 2003); c) treats with priority the consequences and not the causes that determined a certain performance (Kiseľáková *et al*., 2016). Subsequent research has shown that if the analysis based on rates is doubled by an analysis of trends, some imputable aspects can be overcome, creating a foundation for the strategic orientation of the business (Tudose and Avasilcai, 2019). Analysing the research on the measure of financial performance, some authors (Pavelkova and Knapkova, 2005) delimited four stages in the development of financial performance indicators (table 2).

**Table 1. Financial rates and possibilities of determination**

| Categories | Numerator | Denominator |
|---|---|---|
| Profitability rates (ROA, ROE, ROI) | Gross profit, net profit, operating result, turnover | Total assets, total liabilities, permanent capital, equity, share capital, total shares |
| Financial leverage rates | Total debts, long-term debts | Equity, permanent capital, total assets, committed capital |
| Liquidity rates | Current assets, stocks, receivables, cash | Short-term debt (banks also use current assets, and current liabilities) |
| Cash flow rates | Dividend, reinvested earnings, reported earnings | Profit (net, normal, economic) |
| Efficiency rates (asset management) | Stocks, debts, fixed assets, working capital, total income (cost structures) | Turnover, total assets (total costs) |

*Source*: authors' representation

**Table 2. Generations of financial indicators used in performance evaluation**

| Stages and indicators | | | |
|---|---|---|---|
| ***The first generation*** **Profit margin** | ***The second generation*** Profit growth rate | ***The third generation*** Return on assets, capital, investments (ROA, ROE, ROI) | ***The fourth generation*** Value for shareholders (EVA, CFROI, FCF) |

*Source*: Pavelkova and Knapkova, 2005

The fourth generation includes: economic value added (EVA), cash-flow return on investment (CFROI) and free cash flow (FCF). In this study we will focus on economic added value. In its original form - as founded by Alfred Marshall in the late 1800s - the added economic value indicates the extent to which an organization creates real economic profits greater than the remuneration expected of financiers.

One hundred years later, the concept was developed (by the consulting firm Stern Value Management) from the perspective of the ability to generate value for shareholders. Currently, EVA is recognized as a method of measuring performance, being used by many organizations (such as Coca Cola, DuPont, Eli Lilly, Polaroid, Pharmacia and Whirlpool) (Annamalah *et al*., 2018).

As an indicator of measuring financial performance, EVA is determined as the difference between net operating profit after tax and the opportunity cost of invested capital. If the result of this difference is positive, it is admitted that the organization creates value. Otherwise, it is admitted that the organization (through its management) loses value.

Although the determination of EVA seems relatively simple, from a practical point of view it is more complex because it involves making several adjustments to remove the influence of different accounting practices. Research shows that of the 160 possible adjustments, only 10 have a more significant influence on net operating profit after tax and on the opportunity cost of invested capital (Brad and Munteanu, 2012; Almeida *et al*., 2016). These adjustments refer to: depreciation; research, development and training expenses; advertising costs; deferred taxes; intangible assets (such as goodwill); non-interest-bearing debts (such as advances received from customers, salaries and associated expenses), etc. When the analyses aim at evaluating a sample of firms that apply different accounting rules, in order to ensure the representativeness of the results, the achievement of adjustments must also be doubled by the harmonization of the methodologies for determining the variables according to which the performance is assessed.

According to specialists (Daraban, 2017), EVA differs from other performance indicators (such as earnings per share, gross operating surplus and profitability of sales) in that it measures all the costs of running a business (operating costs and financing costs) and focuses on the control of production time, operating costs and capital. At the same time, it has been shown that this method neutralizes the differences in the level of risk that underlie each strategic business unit (Mocciaro Li Destri *et al*., 2012). Moreover, some authors (although they initially opined that there is no convergence of results that unequivocally support the superiority of EVA over traditional performance measurement tools) have concluded that EVA translates the *financial performance indicator into corporate language from recent times* (Bhusan and Pramanik, 2016).

EVA is considered one of the most appreciated performance measurement indicators because it involves all resources and allows decision decentralization (Morard and Balu, 2010). Although the decision centre responsible for monitoring and evaluating performance is placed in the area of financial management (similar to traditional methods that use rates to measure financial performance), this placement does not neglect the overall performance of the company.

Beyond the appreciations received, EVA was considered a vulnerable indicator from an application point of view due to lack of synchronization in traditional accounting systems (due to multiple adjustments to both net operating

profit and invested capital), which generate difficulties of transposition/ determination. Bhusan Sahoo and Kumar Pramanik (2016) showed that EVA analysis: a) does not include elements such as brand capital or human resources; b) does not provide information on the financial performance of companies affected by changes in the business cycle; c) does not stimulate the development of a business's assets (because the acquisition of fixed assets has a negative impact on the performance assessed by EVA).

## 2. Research methodology

Kijewska (2016) pointed out that the results of EVA studies differ significantly from country to country, from sector to sector and even from company to company. For this reason, we opted for a comparative analysis of financial performance for three companies selected according to the following criteria: they operate in the same field of activity (automotive), they are joint stock companies and they are the most important operators on the Romanian market. The analysis period was 2010-2019.

To assess financial performance based on rates, we considered two rates of return (ROA and ROE), a global debt ratio (GI) and two liquidity rates (current ratio - CR and quick ratio - QR). To measure performance using EVA we made three preliminary determinations (see table 3):

- net operation profit after tax (NOPat) adjusted for current depreciation, research and development expenses and advertising expenses;
- invested capital (Ic), including only debt that involves costs (including financial leasing); as part of the invested capital were also considered research, development and advertising expenses, as they produce effects over several years and contribute to the development of the business; from the total invested capital were deducted the amounts that are not related to the management period (advance expenses) and the assets not related to the operational activities (securities held and loans granted); this last adjustment is justified by the fact that both the investments in securities and the loans granted represent cash outflows from the company, reducing the possibilities of financing current activities;
- weighted average cost of capital (WACC) determined according to the cost and share of different financing resources; the determination methodology took into account the particularities of the different sources of financing (own and borrowed); the cost of equity (representing the expected remuneration of shareholders) was determined by reporting the net result to equity; the cost of external capital was determined by relating the expenses related to the debts (after operating the tax deductions) to the value of these cost-bearing financing.

Based on the information collected from secondary sources (annual financial statements, reports of directors / boards of directors), the indicators for assessing financial performance were determined, interpreted and analysed in dynamics. The

results obtained in the rate-based analysis were compared with the results of the EVA-based analysis.

**Table 3. Indicators used in analysis**

| Indicators | Computation method |
|---|---|
| **ROA** | Gross profit / total assets |
| **ROE** | Net profits / own equity |
| **GI** | Total debt / total financing |
| **CR** | Current assets / current liabilities |
| **QR** | Liquid assets / current liabilities |
| **NOPat** | Sales – operational expenses + current depreciation + advertising costs + R&D costs – corporate income tax |
| **IC** | Ic = own capital (Oc) + external capital (financial debts + financial leasing) (Ec) + advertising costs + R&D costs – advance expenses – shares held – loans granted<br>Financial structure: 100% = weight of Oc + weight of Ec |
| **WACC** | Cost of Oc • weigt Oc + cost of Ec • weight of Ec • (1 – tax rate) |
| **EVA** | EVA = NOPat – WACC • Ic |

*Source*: authors' representation according to the existing literature

In order to identify the interdependent relations between EVA and the performance indicators determined on the basis of the rates, we performed correlation and regression analyses. Eviews 9 software was used to perform statistical analyses for the identified econometric models. The analyses were based on the panel data method (OLS adapted to panel data). Because the data in our sample consider a set of 7 indicators, for 3 companies, over a period of ten years, the regression analysis was adapted to panel data. In the first regression analysis we treated EVA as a dependent variable and the rates of return, indebtedness and liquidity were considered independent variables. The size of the company (appreciated by total assets) was considered as control variable. The general equation of the regression model applied is as follows:

$$y_{it} = X_{it}\,\beta_1 + Z_{it}\,\beta_2 + u_{it} \quad (1)$$

where: $i$ represents the companies included in the analysis (A, B or C), $t$ is time (2010…2019); $y_{it}$ is the dependent variable (in our case EVA); $X_{it}$ is the independent variables; $Z_{it}$ is the control variables (in our case the size of the company); $\beta_1$ and $\beta_2$ represent the coefficients; $u_{it}$ is the error term.

Because in the analysed period there were major variations of the macroeconomic indicators, we considered it opportune to complete the performance profile from the perspective of the sensitivity of the different performance measures to the variation of the economic growth. In the second regression analysis, three models were defined that link performance (assessed by ROA, ROE and EVA) to the variation of economic growth (assessed by real GDP growth rate).

The equations of the tested models are:

$$ROA_{it} = GDP_{it}\ \beta_1 + u_{it}\ (2),$$
$$ROE_{it} = GDP_{it}\ \beta_1 + u_{it}\ (3)$$
$$EVA_{it} = GDP_{it}\ \beta_1 + u_{it}\ (4)$$

where: *i* represents the companies included in the analysis (A, B or C), *t* is time (2010…2019); $ROA_{it}$, $ROE_{it}$ *and* $EVA_{it}$ are the dependent variables; $GDP_{it}$ is the independent variable; $\beta_1$ represent the coefficient; $u_{it}$ is the error term.

## 3. Results and discussions

To identify the performance profile, two steps were taken: measurement and evaluation. From a management perspective, measuring performance involves collecting information and determining a set of indicators in order to provide useful information for analysis. The measurement was completed by attaching a value for the measured aspect. In the second stage, the evaluation stage, a preference order was established and opinions were issued on the measured aspect.

For building the performance profile we measured the variables associated with performance. Profitability, liquidity and indebtedness rates were determined for each company (Table 4); then EVA was determined, corresponding to the methodology presented in the previous section (Table 5).

**Table 4. Dynamics of performance measures determined on the basis of reports**

| | Rates | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **2019** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Company A | ROA | 6.03 | 6.03 | 5.22 | 4.56 | 5.62 | 6.73 | 6.37 | 3.86 | 8.14 | 7.02 |
| | ROE | 9.05 | 7.78 | 7.80 | 9.29 | 10.08 | 11.78 | 11.73 | 12.38 | 14.73 | 11.97 |
| | CR | 1.39 | 1.40 | 1.02 | 1.08 | 1.11 | 1.22 | 1.12 | 1.04 | 1.23 | 1.20 |
| | QR | 1.15 | 1.20 | 0.89 | 1.01 | 0.95 | 1.06 | 0.97 | 0.90 | 1.09 | 1.07 |
| | GI | 38.19 | 40.55 | 44.83 | 48.83 | 47.24 | 47.31 | 50.06 | 51.36 | 47.85 | 45.56 |
| Company B | ROA | 3.04 | 4.71 | 5.31 | 5.79 | 6.29 | 5.43 | 9.42 | 7.14 | 5.75 | 4.63 |
| | ROE | 3.46 | 5.81 | 7.55 | 6.56 | 7.37 | 8.54 | 8.64 | 9.13 | 8.05 | 6.86 |
| | CR | 1.49 | 1.64 | 1.57 | 1.97 | 1.84 | 1.81 | 1.64 | 1.88 | 2.02 | 2.24 |
| | QR | 0.95 | 1.09 | 1.42 | 1.35 | 1.05 | 1.05 | 0.90 | 1.05 | 1.23 | 1.35 |
| | GI | 40.93 | 37.14 | 39.60 | 31.19 | 29.39 | 43.72 | 35.42 | 32.29 | 34.77 | 34.37 |
| Company C | ROA | 0.48 | 0.80 | 2.99 | 8.17 | 5.18 | 3.83 | 4.97 | 4.47 | 1.47 | 1.18 |
| | ROE | 0.67 | 1.17 | 4.88 | 13.28 | 6.86 | 5.00 | 6.58 | 5.87 | 1.97 | 1.61 |
| | CR | 1.17 | 1.08 | 1.41 | 1.46 | 1.45 | 1.65 | 1.83 | 1.70 | 1.78 | 2.09 |
| | QR | 0.37 | 0.54 | 0.93 | 1.07 | 1.02 | 1.24 | 1.45 | 1.14 | 1.15 | 1.32 |
| | GI | 52.29 | 51.87 | 45.00 | 43.33 | 35.83 | 34.95 | 35.63 | 37.77 | 33.69 | 34.17 |

*Source*: authors' representation

During the 10 years period, company A records the highest rates of return. With a degree of indebtedness that varies between 38.19% and 51.36% and with ROE greater than ROA, company A proves a superior capitalization of borrowed capital (the cost of interest being lower than the internal profitability of the business). The framing of the two liquidity rates in the accepted reference ranges - [1-2] for current liquidity and [0.65-1] for quick liquidity - completes the profile of a superior performance. Company B has lower rates of return; the degree of indebtedness varies between 29.39% and 43.72%, and the ROE is higher than the ROA; liquidity rates exceed the reference limits, which indicates the existence of excess current assets; the accelerated growth of receivables was the main cause of the lack of fit for the liquidity indicators. Company C has lower rates of return, but with the specification that - even in this case - ROE is higher than ROA (in terms of a degree of indebtedness between 33.69% and 52.29%).

The dynamics of the added economic value is presented in table 5. All three companies register increases in performance (appreciated in terms of real gains generated by the business). Because EVA is determined as an absolute value, comparability at the company level loses its significance. To ensure comparability we started from the following premise: EVA is a performance measurement indicator that involves all resources and measures all the costs of running a business. Based on this premise, we reported EVA to total assets (an indicator frequently used to assess the size of a company).

**Table 5. Dynamics of EVA**

| Compa -nies | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | EVA (million euros) | | | | | | | | | | |
| **A** | 103.18 | 109.76 | 111.35 | 110.73 | 152.39 | 134.82 | 145.44 | 136.40 | 172.36 | 202.16 | 137.86 |
| **B** | 8.28 | 7.66 | 7.43 | 7.17 | 5.90 | 5.42 | 8.19 | 8.51 | 8.68 | 8.52 | 7.58 |
| **C** | 0.54 | 1.06 | 0.01 | 1.65 | 2.46 | 2.12 | 1.56 | 12.94 | 1.79 | 0.81 | 2.49 |
| | EVA adjusted = EVA / Total assets | | | | | | | | | | |
| **A** | 0.09 | 0.09 | 0.08 | 0.07 | 0.10 | 0.09 | 0.09 | 0.07 | 0.08 | 0.09 | 0.09 |
| **B** | 0.09 | 0.08 | 0.08 | 0.08 | 0.06 | 0.05 | 0.07 | 0.07 | 0.06 | 0.06 | 0.07 |
| **C** | 0.03 | 0.05 | 0.00 | 0.06 | 0.10 | 0.08 | 0.06 | 0.40 | 0.05 | 0.03 | 0.09 |

*Source*: authors' representation

The analysis at the level of added economic value adjusted according to the value of the assets employed by the company reveals that for each monetary unit of resource used, on average, 0.09 monetary units of economic value are created (at the level of companies A and C) and 0.07 monetary units at the level company B.

To go through the second stage (performance evaluation) we performed a comparative analysis to establish a ranking of companies and to issue opinions on the measured aspect (performance). The analysis from the perspective of rates and

EVA (as an absolute measure, expressed in monetary units) allows a clear hierarchy of the three companies: A is more efficient than B, and B more efficient than C. Instead, when EVA (as an absolute measure) is replaced by EVA adjusted (according to total assets), the performance ranking changes. Compared to the size of the business, companies A and C have the same ability to create added value. These results confirm that EVA (in the version adjusted according to the size of the company) takes into account all resources (Morard and Balu, 2010), measures all the costs of running a business (Daraban, 2017) and neutralizes the differences in risk level that lie at the basis of each strategic business unit (Mocciaro Li Destri *et al.*, 2012). Moreover, EVA adjusted according to the size of the invested resources allows comparative analysis between companies.

As described in the methodology section, for identifying the interdependent relationships between EVA and performance indicators determined on the basis of rates, we performed a correlation and regression analysis. Before performing the regression analysis, we analysed the results obtained for descriptive statistics (see table 6). The results highlight the fact that the indicators considered in the analysis varied significantly during the analysed period, registering also important differences depending on the company. Thus, the highest value of EVA was recorded by company A in 2019. While the lowest value of this indicator was recorded by company C in 2012. Due to the fact that EVA is an indicator calculated in absolute terms, to obtain correct results in future analyses we calculated natural logarithm from EVA (LEVA). We did the same for the enterprise size indicator.

**Table 6. Descriptive statistics of the variables**

| | **Mean** | **Median** | **Maximum** | **Minimum** | **Std. Dev.** |
|---|---|---|---|---|---|
| **EVA** | 49.309 | 8.235 | 202.160 | 0.010 | 66.154 |
| **LEVA** | 2.318 | 2.108 | 5.309 | -4.605 | 2.280 |
| **ROA** | 5.021 | 5.265 | 9.420 | 0.480 | 2.157 |
| **ROE** | 7.548 | 7.665 | 14.730 | 0.670 | 3.585 |
| **CR** | 1.517 | 1.475 | 2.240 | 1.020 | 0.347 |
| **QR** | 1.065 | 1.065 | 1.450 | 0.370 | 0.227 |
| **GI** | 40.837 | 40.075 | 52.290 | 29.390 | 6.782 |
| **SIZE** | 580.108 | 109.290 | 2146.130 | 19.940 | 757.792 |
| **LSIZE** | 5.120 | 4.691 | 7.671 | 2.992 | 1.724 |

*Source*: authors' representation

The correlation matrix of the variables indicates that some of the variables considered in the analysis are strongly correlated with each other, with a correlation coefficient higher than 0.8 (see table 7). Thus, we observe that ROA and ROE are strongly correlated with each other. CR is also strongly correlated with GI.

In order to eliminate the problem of the existence of multicollinearity and to obtain the most accurate results, we formulated regression models that exclude by

rotation the strongly correlated variables. Thus, the equations of the regression models tested are:

$$LEVA_{it} = ROA_{it}\,\beta_1 + CR_{it}\,\beta_2 + QR_{it}\,\beta_3 + LSIZE_{it}\,\beta_4 + u_{it} \quad (5)$$
$$LEVA_{it} = ROA_{it}\,\beta_1 + QR_{it}\,\beta_2 + GI_{it}\,\beta_3 + LSIZE_{it}\,\beta_4 + u_{it} \quad (6)$$
$$LEVA_{it} = ROE_{it}\,\beta_1 + CR_{it}\,\beta_2 + QR_{it}\,\beta_3 + LSIZE_{it}\,\beta_4 + u_{it} \quad (7)$$
$$LEVA_{it} = ROE_{it}\,\beta_1 + QR_{it}\,\beta_2 + GI_{it}\,\beta_3 + LSIZE_{it}\,\beta_4 + u_{it} \quad (8)$$

**Table 7. The correlation matrix of the variables**

| | **EVA** | **LEVA** | **ROA** | **ROE** | **CR** | **QR** | **GI** | **SIZE** | **LSIZE** |
|---|---|---|---|---|---|---|---|---|---|
| **EVA** | 1.000 | | | | | | | | |
| **LEVA** | 0.819 | 1.000 | | | | | | | |
| | (0.000) | | | | | | | | |
| **ROA** | 0.367 | 0.504 | 1.000 | | | | | | |
| | (0.045) | (0.004) | | | | | | | |
| **ROE** | 0.680 | 0.667 | **0.828** | 1.000 | | | | | |
| | (0.000) | (0.000) | (0.000) | | | | | | |
| **CR** | -0.665 | -0.404 | -0.002 | -0.313 | 1.000 | | | | |
| | (0.000) | (0.026) | (0.987) | (0.092) | | | | | |
| **QR** | -0.101 | 0.084 | 0.291 | 0.175 | 0.637 | 1.000 | | | |
| | (0.593) | (0.655) | (0.117) | (0.354) | (0.000) | | | | |
| **GI** | 0.565 | 0.264 | -0.149 | 0.254 | **-0.859** | -0.652 | 1.000 | | |
| | (0.001) | (0.158) | (0.430) | (0.174) | (0.000) | (0.000) | | | |
| **SIZE** | 0.991 | 0.818 | 0.351 | 0.690 | -0.671 | -0.109 | 0.583 | 1.000 | |
| | (0.000) | (0.000) | (0.056) | (0.000) | (0.000) | (0.565) | (0.000) | | |
| **LSIZE** | 0.926 | 0.896 | 0.469 | 0.712 | -0.514 | 0.006 | 0.418 | 0.937 | 1.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.003) | (0.973) | (0.021) | (0.000) | |

*Note*: In parentheses are presented the values for the probability. With bold are marked the highly correlated variables.
*Source*: authors' representation

The results of the regression analysis adapted to the panel data are centralized in Table 8. The values obtained for the regression coefficients indicate that the ROA exerts a positive and statistically significant influence on the ability to create economic value by the analysed companies. Therefore, increasing the return on assets can be considered a precondition for increasing added value. The regression analysis also indicated that the indebtedness rate exerts a statistically negative and significant influence on the ability of companies to create real economic profits, showing that an increase in companies' indebtedness will lead to a reduction in EVA. These results are relevant because, in the formula for determining the EVA, the opportunity cost of the invested capital is deducted from the net operating profit (after tax). Therefore, it is expected that with the increase of the invested capital (respectively, the cost of this capital) the EVA will decrease.

The coefficients obtained for the control variable are positive and statistically significant in all 4 models, which shows that the size of the company determines in an increased proportion its ability to create added economic value. In this study, the size of the company was assessed by the total volume of assets. Therefore, the statistical models formulated confirm that the performance of a company (assessed by EVA) can increase as the volume of resources invested increases. Our results are in line with previous research that has shown that financial performance reflects the ability of companies to efficiently manage and use the resources at their disposal (Mahrani and Soewarno, 2018, Orozco *et al.*, 2018), respectively, the effectiveness and efficiency of management in use of company resources (Egbunike and Okerekeoti, 2018).

**Table 8. Regression analysis**

| Dependent variable LEVA | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| **ROA** | **0.091**** | **0.062*** | - | - |
| | **(0.039)** | (0.035) | | |
| **ROE** | - | - | 0.022 | 0.080 |
| | | | (0.029) | (0.058) |
| **CR** | 0.031 | - | 0.166 | - |
| | (0.707) | | (0.711) | |
| **QR** | 0.511 | -0.205 | 0.568 | -0.670 |
| | (0.498) | (0.520) | (0.428) | (0.565) |
| **GI** | - | **-0.093**** | - | **-0.119***** |
| | | **(0.041)** | | **(0.041)** |
| **LSIZE** | **1.134***** | **1.219***** | **1.168***** | **0.002***** |
| | (0.173) | (0.161) | (0.197) | (0.004) |
| **Constant** | **-4.545**** | **-2.284**** | **-4.698**** | **5.672***** |
| | (1.879) | **(1.017)** | **(1.920)** | (1.706) |
| **Observations** | 30 | 30 | 30 | 30 |
| **R-squared** | 0.815 | 0.821 | 0.810 | 0.747 |
| **Adjusted R-squared** | 0.785 | 0.792 | 0.780 | 0.706 |
| **F-statistic** | 27.604*** | 28.689*** | 26.782*** | 18.473*** |

Note: *, ** and *** show that the coefficients are statistically significant with a probability of 1%, 5% or 10%

*Source*: authors' representation

The other variables, ROE, CR and QR, did not resulted in having a statistically significant effect on the added value created by the companies considered in the analysis.

The Adjusted R Square result indicates that about 78% of the EVA variation is explained by the independent variables included in the regression model. The values of the significance test F provided non-zero values, indicating that there is at least a non-zero coefficient. This test covers all independent variables and verifies

the significance of the entire regression. The results in Table 8 indicate that the model validation condition is met (P-value <0.05). Therefore, regression models are statistically significant, for which it can be admitted that the ability to create economic value depends on the achievement of high rates of economic profitability.

Macroeconomic factors, which are not under the control of management, also make their mark on corporate performance (Barakat *et al.*, 2016; Akinyomi, 2013). Given the fact that the analysed period was characterized by major variations of macroeconomic indicators, we considered it appropriate to analyse the sensitivity of different performance measures to changes in macroeconomic variables. To test these interdependencies, we defined three models that link performance (assessed by profitability rates, respectively by EVA) to the variation of economic growth (assessed by real GDP growth rate). The results are summarized in Table 9.

**Table 9. Interdependencies: performance – real GDP growth rate**

| Variables | Dependent variable ROA | Dependent variable ROE | Dependent variable LEVA |
|---|---|---|---|
| **Real GDP growth rate** | **0.254*** (0.063)** | **0.495*** (0.052)** | **0.114* (0.058)** |
| **Constant** | **4.093*** (0.213)** | **5.744*** (0.402)** | **1.902*** (0.330)** |
| **Observations** | 30 | 30 | 30 |
| **R-squared** | 0.106 | 0.145 | 0.019 |
| **Adjusted R-squared** | 0.074 | 0.115 | -0.015 |
| **F-statistic** | 3.334*** | 4.774*** | 0.465 |

*Note*: *, ** and *** show that the coefficients are statistically significant with a probability of 1%, 5% or 10%
*Source*: authors' representation

The data in Table 9 show that 10.6% of the ROA variation, respectively 14.5% of the ROE variation can be explained by the real GDP growth rate variation. The regression analysis at the level of the three models revealed that only two models are statistically significant, models for which the P-value was less than 0.05 (for ROA and ROE as dependent variables). The model that tests the influence of real GDP growth rate on the added economic value of companies is not statistically significant. The coefficients obtained show that a 10% increase in the real GDP growth rate can lead to an increase in ROA for the analysed companies of 2.5%, and an increase of 4.9% in ROE. Our results confirm the results of previous research which showed that macroeconomic indicators, such as inflation rate and growth rate, have a significant impact on financial performance (Egbunike and Okerekeoti, 2018).

## Conclusions

The option for analysing the financial performance profile built on the basis of rates and economic value added is justified by the fact that both analyses are placed in the area of financial management. The importance of the researched topic flows from the fact that, in order to be sustainable, companies must take care of their financial performance. In choosing the performance indicators we started from the consideration that financial performance shows "how effective and efficient an organization is in achieving its goals" (Suhadak *et al*., 2019), highlights "the company's ability to manage and control its resources" (Mahrani and Soewarno, 2018) and reflects "the ability to create economic value" (Orozco *et al*, 2018).

The study begins with the theoretical substantiation of the particularities of measuring financial performance based on financial reports and economic value added. In this context, the advantages and disadvantages of using different performance measures are pointed out. Empirical research is carried out on the example of three companies in the automotive industry. To assess the financial performance based on the rates, we considered two rates of return (ROA and ROE), a global debt ratio and two liquidity rates (current ratio and quick ratio). To measure performance using EVA, we performed three preliminary determinations: net operation profit after tax (NOPat), invested capital (Ic) and weighted average cost of capital (WACC). Based on these indicators, two performance profiles were built. The first performance profile allowed the ranking of companies according to the size and dynamics of the determined financial rates. This first preliminary analysis indicated that the highest rates of return are obtained in terms of a degree of indebtedness of over 45% and liquidity rates within the recommended reference ranges. The second performance profile was built based on EVA dynamics. To ensure comparability, we proposed adjusting the EVA according to the size of the total assets held by the company. This adjustment changed the performance hierarchy based on financial rates (pointing out that the size of assets is more important than indebtedness and liquidity when performance is assessed in terms of added value).

In order to identify the interdependence relations between EVA and the performance indicators determined on the basis of the rates, we performed correlation and regression analyses. In the first regression analysis we treated EVA as a dependent variable and the rates of return, indebtedness and liquidity were considered independent variables. The size of the company (appreciated by total assets) was considered a control variable. The results of this first regression analysis indicated that:

1) ROA has a positive and statistically significant influence on the ability to create the economic value of the analysed companies;
2) the indebtedness rate exerts a negative and statistically significant influence on the capacity to create the real economic profits of the companies;
3) the size of the company (appreciated by the value of the assets) positively influences the ability to create added economic value.

Given the fact that the analysed period was characterized by major variations of macroeconomic indicators, we considered it appropriate to analyse the sensitivity of different performance measures to the variation of economic growth. To test these interdependencies, we defined three models that focus on identifying the link between performance (assessed by ROA, ROE and EVA) and the variation of economic growth (assessed by real GDP growth rate). The regression analysis at the level of the three models revealed that only two models are statistically significant. The coefficients obtained show that an increase in real GDP growth rate can lead to an increase in ROA and ROE.

The study is useful to both researchers (because it presents an original review of the literature on measuring financial performance and provides evidence of the interdependence between different measures of performance) and practitioners (because empirical research can serve as a guide for a correct measurement and evaluation of financial performance of companies).

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