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# **THE RELATIONSHIP BETWEEN EARNINGS MANAGEMENT AND THE FINANCIAL PERFORMANCE OF AN ENTERPRISE – EVIDENCE FROM THE WARSAW STOCK EXCHANGE**

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## **ZARZĄDZANIE ZYSKIEM A FINANSOWE DOKONANIA PRZEDSIĘBIORSTW – ODNIESIENIE DO SPÓŁEK AKCYJNYCH NOTOWANYCH NA GPW W WARSZAWIE**

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**Summary:** Modern business practice is increasingly emphasizing the problem of discrepancies between the information needs of the company's stakeholders and the quality of the reported results of the business entity. This phenomenon is accompanied by the temptation to overexpose this information, which shows the potential and the past, current and future results of the company in a better light in the eyes of its stakeholders, while at the same time hindering the perception of the processes reflecting its potential weaknesses. The main goal of the paper is to examine the relationship between accrual-based earnings management and the financial performance of industrial joint-stock companies listed on the Warsaw Stock Exchange in 2002-2017. From the perspective of research methodology, the Dechow, Sloan and Sweeney model was used to extract individual subcategories of accruals. In turn, a modified version of the Jamkarani and Hozzi model was used to assess the impact of discretionary accruals on shaping the ROA and ROE values. Other conducted analyses were based on the ordinary-least-square regression (OLS), ANOVA tests, correlation matrix and descriptive statistics of tested variables.

**Keywords:** accrual-based earnings management, financial performance, discretionary accruals, Warsaw Stock Exchange.

**Streszczenie:** Współczesna praktyka gospodarcza coraz częściej akcentuje problem rozbieżności między potrzebami informacyjnymi interesariuszy przedsiębiorstwa a jakością raportowanych dokonań jednostki gospodarczej. Zjawisku temu towarzyszy pokusa nadmiernej ekspozycji tych informacji, które ukazują potencjał działania oraz przeszłe, bieżące i przyszłe wyniki przedsiębiorstwa w lepszym świetle, a jednocześnie utrudnią dostrzeże-

nie zjawisk i procesów odzwierciedlających jego potencjalne słabości. Zasadniczym celem artykułu jest zbadanie zależności zachodzącymi między praktykami z zakresu zarządzania zyskiem (typu rachunkowego) a finansowymi dokonaniai przemysłowych spółek akcyjnych notowanych na GPW w Warszawie w okresie 2002-2017. Do ekstrakcji poszczególnych subkategorii korekt memoriałowych wykorzystano model Dechow, Sloana i Sweeney. Z kolei do oceny wpływu korekt dyskrecjonalnych na kształtowanie wartości współczynników ROA i ROE użyto zmodyfikowanej wersji modelu autorstwa Jamkarani i Hozzi. Całość badań dopełniają analizy miar dyspersji, testy ANOVA, czy też analizy korelacji liniowej Pearsona.

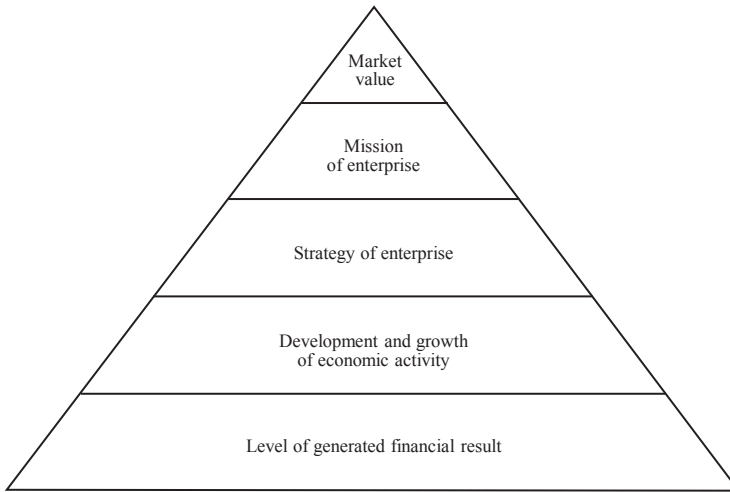
**Słowa kluczowe:** zarządzanie zyskiem, dokonania finansowe, korekty dyskrecjonalne, Giełda Papierów Wartościowych w Warszawie.

## 1. Introduction

Adopting the thesis of shareholders' interest as one of the primary objectives of modern enterprises, draws attention to the significant problem of communication with these investors against the background of the information needs of other stakeholders. Shareholders who invest their own capital in the company expect full and reliable information on the manner of the economic and social justification for investing the funds. This group of stakeholders bear the greatest risk associated with the functioning and development of the company and therefore they may feel the greatest need to receive complete, objective information of the company's performance on time and in a specific form (Świdarska and Więclaw, 2012, p. 2).

The essence of business entity performance can be presented both as the potential for action as well as the past, present and future activities undertaken within the organization (Niemiec, 2016, p. 33). Contemporary authors agree that a comprehensive performance evaluation should be based on the use of both financial and non-financial measures (see *inter alia*: Buhovac and Groff, 2012, pp. 68-103; Kohlbacher and Reijers, 2013, pp. 245-262). However, for many investors, the most important reference core still remains the first mentioned group, and above all – the generated financial result. In a narrower dimension, it can be assumed that profitability analysis – based on the value of reported profit (loss) on a given area of business activity – is one of the basic tools of enterprise management, as it allows determining the ability of individual components of assets and liabilities to generate profit. At the same time, in a broader sense, the financial result has a direct impact on the development possibilities of the enterprise, the increase of its business activity, the fulfillment of the stated strategy and mission of the organization, and consequently, on the increase of its market value (Krajewski, 2012, p. 113; Figure 1).

Modern economic practice shows that enterprises are engaged in the intentional shaping of the reported financial result, which reflects not only the real activities of managers (do they take into account the interests of a larger group of stakeholders during the decision-making process, or are they guided by private, 'low' incentives?), but also investor behaviour in inefficient capital markets. These practices, referred to as the earnings management phenomenon, can exert a progressive influence on



**Fig. 1.** Influence of financial performance on fulfilling the company's goals

Source: (Krajewski, 2012).

the misinterpretation of the results achieved by the company, and as a result – on misleading all (or even a large part) of the groups interested in the functioning of a business entity.

The main aim of the paper is to examine the relationship between accrual-based earnings management and the financial performance of public industrial stock companies listed on the Warsaw Stock Exchange. The set research goal was operationalized by two hypotheses, claiming that:

- H.1. In the tested population discretionary accruals (being the main indicator of the level of earnings management practices) have a significant relationship with current values of Return on Assets (*ROA*) and Return on Equity (*ROE*) ratios.
- H.2. In the studied sample, there are statistically significant correlations between discretionary accruals and future values of *ROA* and *ROE*.

The assessment of these relationships is important from the perspective of estimating current and future benefits by stakeholders of the capital invested. It will also answer the question whether the presented values of the main profitability ratios are largely dependent on the adopted practices and accounting estimates as well as the use of discretion in financial reporting?

Empirical studies were carried out among public industrial companies included in the Prime Market of the WSE, whose shares were traded on the stock market for at least 12 years in the period 2002-2017. The conducted research is based on the Notoria Service SA database.

## 2. Accrual-based earnings management – definition and its influence on reporting financial results

One of the most holistic approaches to defining the issue of the intentional shaping of financial results claims that earnings management is an objective or set of objectives adopted by the management board of the reporting entity and an integrated set of instruments of their implementation (accounting type – associated with the adopted methods and estimates in accounting, or real type – related to conducted transactions), which result in the lack of showing the (short-term) financial result, which is known to the management board, that would be shown in the financial statement in the absence of a specific subgroup of objectives and instruments. However, it is assumed that the shaping of the financial result is carried out in correspondence with the reporting entity's adopted balance sheet policy (especially in the field of accounting instruments), and therefore it is consistent with balance sheet law (Piosik, 2016, p. 20).

This definition emphasizes two ways of the purposeful shaping of the financial result. One of them (hereinafter referred to as accrual-based earnings management) is the space of accruals, extracted in the cash flow statement prepared using the indirect method. The special cognitive value of accruals can be obtained when in the structure of total accruals it will be possible to extract discretionary accruals that do not relate directly to the real activity of the enterprise and present the summary expression of subjective accounting choices. The second one (which is not, however, an essential reference point in the paper) refers to the real earnings management sphere, which can be treated as management operational activities to alter reported earnings in a particular direction, which is achieved by overproducing the inventory to lower the cost of goods sold or cutting discretionary expenses (i.e. advertising spend, research and development expenditure, sales, general and administrative expenses) to improve reported margins (Huang and Sun, 2017, p. 92).

The literature on the subject contains various and often contradictory views referring not only to the location of accrual-based earnings management in the perspective of accounting policy, accounting engineering, variant accounting, etc., but also its impact on the reported net profit (loss). Ronen and Yaari (2008, pp. 25-31) label earnings management practices as: “white” if they are beneficial for the company, “black” if they are detrimental, or “grey” if either one can occur. To make it more specific, according to those scientists, beneficial earnings management enhances the transparency of reports and takes the shape of taking advantage of the flexibility in the choice of accounting treatment to signal the manager's private information on future cash flows. The neutral earnings management is strictly connected with choosing the accounting treatment which provides either opportunistic or economic efficiency. Eventually, the pernicious interpretation of earnings management describes this as the practice of using tricks to misrepresent or reduce the transparency of the financial reports. The selected definitions of accrual-based earnings management presented in

Table 1 allow to emphasize the different motives and ways of realizing the benefits of stakeholders due to the application of specific methods and techniques of creating financial results by business entities.

**Table 1.** Selected definitions of accrual-based earnings management found in accounting or financial literature

| Interpretative context                 | Author(s)                       | Definition of accrual-based earnings management  |
|--|---------------------------------|--|
| Pernicious (black) earnings management | Schipper (1989)                 | “Disclosure management” in the sense of a purposeful intervention in the external financial reporting process, with the intent of obtaining private gain.  |
|  | Healy, Wahlen (1999)            | The manipulation of the companies’ financial statements by managers based on their own judgment, with the purpose of confusing users about the company’s real economic situation, or to influence contracts that can rely on financial statements. |
| Neutral (grey) earnings management     | Davidson, Stickney, Weil (1987) | The process of taking deliberate steps within the constraints of generally accepted accounting principles to bring about the desired level of reported earnings.   |
|  | Wójtowicz (2010)                | The possibility of shaping the financial result is caused by the fact that managers apply professional judgment, which can be used against other users of financial statements.  |
| Beneficial (white) earnings management | McKee (2005)                    | Reasonable and legal management decisions making and reporting intended to achieve stable and predictable financial results.   |
|  | Lopes (2018)                    | White earnings management takes advantage of flexibility in the choice of accounting treatments to signal the manager’s private information on future cash flows.  |

Source: own study.

The quoted terminology of accrual-based earnings management practices indicates that some researchers postulate the need to include this phenomenon as creative accounting, taking the view that it is only and exclusively the result of authorized accounting operations related to the creative and non-standard interpretation of accounting principles. Others, in turn, postulate this phenomenon in the aggressive accounting structure, which is a conscious and deliberate action aimed at processing and presenting economic events in a manner that is close to violating the law. Yet others emphasize the functional nature of this process and its discretion and consider them in terms of implemented accounting practices, which not only do not affect the reliability of the financial statements, but even strive to improve its quality (e.g. by signalling factors that affect the value of an entity in the longer horizon).

The results of empirical research on the impact of earnings management on financial performance of listed companies are also ambiguous. DeFond and Park (1997) studied the relationship between the discretionary accruals and company performance and

found a negative correlation between the two but, however, indicated the positive relationship when considering the future yearly profitability. Hassan and Ahmed (2012) argued that collections are the most widely recognized exercises of earnings management that are performed by management to either improve or deduct revealed earnings. Awais, Hunjra, Butt and Ijaz (2016) pointed out that evidence from Asian markets demonstrated that companies involved in earnings manipulation did not benefit through increased profitability in the long term. Jamkarani and Hozzi (2015) revealed that earnings management has a negative significant relationship with future values of *ROA* and stated that the greater the extent of accrual-based earnings management using accounting manipulations through accounting methods, the lesser the firm's future *ROA* will be. In turn, Umobong and Ogbonna (2017) discovered the inverse relationship between the mentioned economic variables. Their study indicates that an increase in earnings quality will decrease *ROE* and *ROA* coefficients. This confirms that the improved quality of earnings mitigates earnings management and reduces bloated earnings, thereby improving accounting quality.

### 3. Data sample and research methodology

As indicated earlier, empirical research was carried out among industrial public companies listed in the Warsaw Stock Exchange whose shares have been traded for at least 12 years within the 2002-2017 reference period. Additionally, the sample selection was based on the criteria as following:

- the fiscal year of the firm should end on 31 December;
- the studied companies should be active consistently during the adopted research period;
- all of the financial required data must be available in the annual separate financial statements.

Consequently, the study was carried out in 75 listed companies from twelve branches of industry, which provided a sample of 1126 observations.

The first stage of empirical research was aimed at extracting discretionary accruals, whose values do not depend on the nature of pre-economic operations and present a summary of the entirety of the subjective accounting choices in organization. To assess the degree of accrual-based management earnings, the authors used the modified version of the Jones model, proposed by Dechow, Sloan and Sweeney (1995, pp. 133-168). This model assumes that the value of operational accruals is determined by two variables: change in sales revenues less change in short-term receivables ( $\Delta REV - (\Delta REC)$ ) and average value of property, plant and equipment (*PPE*), whereas the value of discretionary accruals (*DACC*) is based on the difference between the empirical and theoretical value of total accruals (*TACC*)<sup>1</sup>

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<sup>1</sup> The amount of total accruals, *TACC*, is the difference between the net income in a given year computed by using an accrual-based accounting system and the surplus in cash from operating activities.

as the explained variable. For the sake of comparability of data, the model should be standardized using the value of lagged total assets. Consequently, the formula of the accruals model takes the final form as below:

$$\frac{TACC_{i,t}}{TA_{i,t-1}} = \alpha_1 \left( \frac{1}{TA_{i,t-1}} \right) + \alpha_2 \left( \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{TA_{i,t-1}} \right) + \alpha_3 \left( \frac{PPE_{i,t}}{TA_{i,t-1}} \right) + \varepsilon_{i,t}$$

where:  $\Delta REV_{i,t}$  indicates a change in sales revenues of company  $i$  in year  $t$ ;  $\Delta REC_{i,t}$  indicates an increase in short-term receivables company  $i$  in year  $t$ ;  $PPE_{i,t}$  shows gross property, plant and equipment of company  $i$  in year  $t$ ;  $\alpha_p, p = 0, 1, \dots, k$  are specific regression parameters while  $\varepsilon_{i,t}$  denotes error term in the regression model.

At the same time the value of  $\varepsilon_{i,t}$  forms the essential basis for the assessment of the direction and range of accrual-based earnings management ( $\varepsilon_{i,t} = DACC$ ) in the analysed company:

$$DACC_{i,t} = \frac{TACC_{i,t}}{TA_{i,t-1}} - \left[ \alpha_1 \left( \frac{1}{TA_{i,t-1}} \right) + \alpha_2 \left( \frac{REV_{i,t} - REC_{i,t}}{TA_{i,t-1}} \right) + \alpha_3 \left( \frac{PPE_{i,t}}{TA_{i,t-1}} \right) \right]$$

where:  $DACC_{i,t}$  indicates discretionary accruals of company  $i$  in year  $t$ ; other designations – as above.

In the next stage, to test the research hypothesis, modified versions of the Jamkarani and Hozzi models (2016, pp. 1013-1019) were used. The *ROA* coefficient as the dependent variable, which is calculated by dividing a company's net profit by its total assets, was tested using the *m1* and *m2* models. In turn, the *ROE* coefficient, whose value is determined as the ratio of net profit and total equity, was tested by using the *m3* and *m4* models. From the perspective of the changes made to the original version of the Jamkari and Hozzi models, the variable illustrating the increase in sales revenue was replaced by the variable illustrating the increase in the company's assets. In the authors' opinion, the variable illustrating investing in assets to a greater extent emphasizes the importance of the implemented financial strategy from the perspective of future financial performance. The financial strategy is after all an important set of criteria and rules, subordinated to the implementation of the strategic goal of the enterprise, by which managers are guided in the decision-making process about raising funds for current and development activities and determining the directions and ways of using these resources with the fulfillment of existing opportunities, threats and relationships with the environment (Kołosowska, Chojnacka, Tokarski, and Tokarski 2012, p. 12). Detailed analytical formulas of the described regression models are given below, namely:

$$ROA_{i,t} = \alpha_0 + \alpha_1 DACC_{i,t} + \alpha_2 LEV_{i,t} + \alpha_3 SIZE_{i,t} + \alpha_4 SG_{i,t} + \alpha_5 (DACC \times LEV)_{i,t} + \alpha_6 (DACC \times SIZE)_{i,t} + \varepsilon_{i,t} \quad (m1)$$

$$ROA_{i,t+1} = \alpha_0 + \alpha_1 DACC_{i,t} + \alpha_2 LEV_{i,t} + \alpha_3 SIZE_{i,t} + \alpha_4 SG_{i,t} + \alpha_5 (DACC \times LEV)_{i,t} + \alpha_6 (DACC \times SIZE)_{i,t} + \varepsilon_{i,t} \quad (m2)$$

$$ROE_{i,t} = \alpha_0 + \alpha_1 DACC_{i,t} + \alpha_2 LEV_{i,t} + \alpha_3 SIZE_{i,t} + \alpha_4 SG_{i,t} + \alpha_5 (DACC \times LEV)_{i,t} + \alpha_6 (DACC \times SIZE)_{i,t} + \varepsilon_{i,t} \quad (m3)$$

and:

$$ROE_{i,t+1} = \alpha_0 + \alpha_1 DACC_{i,t} + \alpha_2 LEV_{i,t} + \alpha_3 SIZE_{i,t} + \alpha_4 SG_{i,t} + \alpha_5 (DACC \times LEV)_{i,t} + \alpha_6 (DACC \times SIZE)_{i,t} + \varepsilon_{i,t} \quad (m4)$$

where:  $DACC_{i,t}$  indicates discretionary accruals of company  $i$  in year  $t$ ;  $LEV_{i,t}$  shows financial leverage of company  $i$  in year  $t$  (calculated as total debts to total assets),  $SIZE_{i,t}$  indicates the logarithm of total assets of company  $i$  in year  $t$ ;  $SG_{i,t}$  indicates company's growth strategy of company  $i$  in year  $t$  (calculated as a relative increase in assets); other designations – as above.

For the sake of completeness, it should be added that the executed analyses were based on the ordinary-least-square regression (OLS), ANOVA tests, correlation matrix and descriptive statistics of the tested variables.

#### 4. Empirical results

Table 2 presents the descriptive statistics of all tested variables used for the test research hypotheses. An analysis of empirical research shows that in most cases the discretionary accruals extracted by the Dechow, Sloan and Sweeney model ( $DACC$ ) took the form of observations with negative values (53%). This allows for the presumption that the manipulation of financial statements in the surveyed companies was directed towards increasing and reducing the financial results in congruous terms. From the perspective of indicators illustrating financial performance ( $ROA$  and  $ROE$  coefficients), it is noticeable that more than 80% of companies showed the annual positive values of these ratios, which proves their profitability. However, it is important to emphasize the high values of statistical dispersion measures that were shown in relation to the discussed variables.

The results of the outcome of correlation analysis as presented in Table 3 show that between the discretionary accruals extracted by the Dechow et al. model and the variables illustrating: financial performance ( $ROA$  and  $ROE$ ), company's size ( $SIZE$ ) or implemented financial strategies ( $LEV$ ), there exist statistically significant correlations. Primarily, strong positive correlations can be reported in the case of the relationship between discretionary accruals and  $ROA$  coefficient (Pearson linear correlation coefficient result as 0.579). In turn, the results from Table 3 further indicate the fact that in the studied population there exist negative correlations



**Table 2.** Descriptive statistics for individual categories of variables used for testing the research hypotheses

| Variables | Statistical dispersion measures |         |                |        |                |                |                  |
|-----------|---------------------------------|---------|----------------|--------|----------------|----------------|------------------|
|           | min.                            | max.    | first quartile | median | third quartile | std. deviation | positive observ. |
| ROA       | -2.143                          | 1.025   | 0.008          | 0.039  | 0.089          | 0.133          | 81%              |
| ROE       | -4.239                          | 21.416  | 0.015          | 0.070  | 0.149          | 0.798          | 82%              |
| DACC      | -1.204                          | 0.627   | -0.047         | -0.005 | 0.043          | 0.107          | 47%              |
| SIZE      | 2.384                           | 7.662   | 4.934          | 5.299  | 5.795          | 0.684          | 100%             |
| LEV       | 0.004                           | 185.521 | 0.282          | 0.408  | 0.533          | 5.721          | 100%             |
| SG        | 0.000                           | 105.182 | 0.946          | 1.059  | 1.190          | 3.385          | 100%             |

Source: own study.

**Table 3.** Correlation matrix between discretionary accruals and the other tested explanatory variables

| Tested variables    |      | DACC          | ROA           | ROE          | SIZE          | LEV    | SG |
|---------------------|------|---------------|---------------|--------------|---------------|--------|----|
| Pearson correlation | DACC | 1             |               |              |               |        |    |
|                     | ROA  | <b>0.579*</b> | 1             |              |               |        |    |
|                     | ROE  | <b>-0.236</b> | <b>-0.318</b> | 1            |               |        |    |
|                     | SIZE | 0.045         | <b>0.187</b>  | -0.077       | 1             |        |    |
|                     | LEV  | <b>-0.262</b> | <b>-0.515</b> | <b>0.827</b> | <b>-0.135</b> | 1      |    |
|                     | SG   | -0.024        | -0.026        | -0.015       | -0.028        | -0.013 | 1  |

\*The bold font indicates correlations that are statistically significant at the  $p$ -value = 0.05.

Source: own study.

between discretionary accruals and financial leverage (correlation coefficient result as -0.262), and *ROE* coefficient (correlation coefficient result as -0.236). The presented research results therefore indicate the ambiguous impact of accrual-based earnings management practices on the financial performance of enterprises listed on the Warsaw Stock Exchange, hence the need to expand them with the use of the Jamkarani and Hozzi models.

Table 4 presents the results of the regressions (the Anova test, as well as model summary) which tested shaping the current value of the *ROA* coefficient as a dependent variable. The first finding worth commenting on is the goodness-of-fit of the examined model to empirical data. The results indicate that about 40% of the variation of the dependent variable (*ROA*) can be explained by the independent variables, suggesting that, simultaneously, the explanatory variables are significantly associated with the current value of the *ROA* coefficient. Furthermore, considering the resulting *F*-statistic and its *p*-value, it can be stated that the tested model has generally a high significance level. Taking the value of the Durbin-Watson test into

account (1.99), it can be noted that there is no first-order autocorrelation among residuals within models. Interestingly, the empirical evidence from the study indicates that – according to the first assumptions – the first research hypothesis was accepted. The obtained results clearly indicate that discretionary accruals (*DACC*) statistically significantly shape the current value of the *ROA* coefficient (as depicted in *p*-value close to 0). Based on the results of the regressions carried out, statistically significant relationships between the *ROA* coefficient and other independent variables were also noted in relation to: company size (*SIZE*), implemented financial strategy (*LEV*) and assets growth strategy (*SG*).

**Table 4.** The results of the ANOVA test and regression analysis (dependent variable – *ROA* current value)

| ANOVA                      | Sum of squares | Mean square | <i>F</i> | Sig.  |
|----------------------------|----------------|-------------|----------|-------|
| Regression                 | 7.459          | 1.243       | 115.997  | 0.000 |
| Residual                   | 11.093         | 0.011       |          |       |
| Total                      | 18.552         |             |          |       |
| Regression analysis        | Coefficient    | std. err.   | <i>t</i> | Sign. |
| (Constant)                 | -0.030         | 0.027       | -1.129   | 0.259 |
| DACC                       | -1.438         | 0.177       | -8.122   | 0.000 |
| SIZE                       | 0.026          | 0.005       | 5.446    | 0.000 |
| LEV                        | -0.146         | 0.017       | -8.802   | 0.000 |
| SG                         | -0.003         | 0.001       | -2.704   | 0.007 |
| DACC and SIZE              | 0.337          | 0.037       | 9.175    | 0.000 |
| DACC and LEV               | -0.147         | 0.019       | -7.845   | 0.000 |
| <i>R</i>                   | 0.634          |             |          |       |
| <i>R</i> square            | 0.402          |             |          |       |
| adjusted <i>R</i> square   | 0.399          |             |          |       |
| std. error of the estimate | 0.104          |             |          |       |
| Durbin-Watson              | 1.99           |             |          |       |

Source: own study.

Taking into considerations the research results presented in Table 5 (in particular the value of the *F*-statistic and *p*-value), it can be stated that the regression model explaining the shaping of the current value of the *ROE* coefficient (as the dependent variable) is characterized by a high significance level. As before, by using the Durbin-Watson test, the potential occurrence of autocorrelation of residual components was negated. Finally, consistent with *a priori* expectation, finding for the first research hypothesis suggest a significant relationship between the scope of earnings management and the current value of the *ROE* coefficient (as an indicator of a company’s financial performance) was confirmed (as depicted in *p*-value close to 0). However, in this case negative correlations were reported.

**Table 5.** The results of the ANOVA test and regression analysis (dependent variable – *ROE* current value)

| ANOVA                      | Sum of squares | Mean square | <i>F</i> | Sig.  |
|----------------------------|----------------|-------------|----------|-------|
| Regression                 | 464.73         | 77.456      | 399.57   | 0.000 |
| Residual                   | 201.79         | 0.193       |          |       |
| Total                      | 666.53         |             |          |       |
| Regression analysis        | Coefficient    | std. err.   | <i>t</i> | Sign. |
| (Constant)                 | -0.069         | 0.113       | -0.610   | 0.542 |
| DACC                       | -4.143         | 1.116       | -3.713   | 0.000 |
| SIZE                       | 0.049          | 0.020       | 2.419    | 0.016 |
| LEV                        | -0.255         | 0.072       | -3.531   | 0.000 |
| SG                         | -0.003         | 0.004       | -0.704   | 0.481 |
| DACC and SIZE              | -0.401         | 0.081       | -4.972   | 0.000 |
| DACC and LEV               | 0.778          | 0.209       | 3.725    | 0.000 |
| <i>R</i>                   | 0.835          |             |          |       |
| <i>R</i> square            | 0.697          |             |          |       |
| Adjusted <i>R</i> square   | 0.696          |             |          |       |
| Std. error of the estimate | 0.440          |             |          |       |
| Durbin-Watson              | 2.02           |             |          |       |

Source: own study.

The next stage of the research consists of the examinations of goodness-of-fit of the regression models useful for determining the future values of the *ROA* and *ROE* coefficients. Summary statistics for the regression analysis included in Tables 6 and 7 show that the degree of matching tested models to the empirical data were minor, although noticeable. The results point out that respectively a 13.5% (*ROA* future value) and a 4.3% (*ROE* future value) variation of the dependent variable can be explained by the independent variables, such as: discretionary accruals (*DACC*), firm size (*SIZE*), financial leverage (*LEV*) or increases in assets (*SG*). In general terms, the statistical usefulness of the two described models in detecting future financial performance seems not to be congruent for industrial enterprises listed in the Warsaw Stock Exchange.

Further analysis of Tables 6 and 7 indicates several other findings worthy of comment. First of all, in the studied sample there is no positive correlation between accrual-based management earnings and future financial performance. Both in the case of *ROA* and *ROE* coefficients, the discretionary accruals variable did not prove to have a statistically significant effect on the formation of dependent variables.

**Table 6.** The results of the ANOVA test and regression analysis (dependent variable – ROA future value)

| ANOVA                      | Sum of squares | Mean square | <i>F</i> | Sig.  |
|----------------------------|----------------|-------------|----------|-------|
| Regression                 | 1.877          | 0.313       | 25.438   | 0.000 |
| Residual                   | 12.016         | 0.012       |          |       |
| Total                      | 13.893         |             |          |       |
| Regression analysis        | Coefficient    | std. err.   | <i>t</i> | Sign. |
| (Constant)                 | -0.032         | 0.029       | -1.100   | 0.272 |
| DACC                       | 0.310          | 0.304       | 1.018    | 0.309 |
| SIZE                       | 0.027          | 0.005       | 5.257    | 0.000 |
| LEV                        | -0.166         | 0.019       | -8.721   | 0.000 |
| SG                         | -0.001         | 0.001       | -1.217   | 0.224 |
| DACC and SIZE              | -0.018         | 0.056       | -0.319   | 0.750 |
| DACC and LEV               | -0.183         | 0.021       | -8.618   | 0.000 |
| <i>R</i>                   | 0.368          |             |          |       |
| <i>R</i> square            | 0.135          |             |          |       |
| Adjusted <i>R</i> square   | 0.130          |             |          |       |
| Std. error of the estimate | 0.111          |             |          |       |
| Durbin-Watson              | 1.96           |             |          |       |

Source: own study.

**Table 7.** The results of the ANOVA test and regression analysis (dependent variable – ROE future value)

| ANOVA                      | Sum of squares | Mean square | <i>F</i> | Sig.  |
|----------------------------|----------------|-------------|----------|-------|
| Regression                 | 9.330          | 1.555       | 8.301    | 0.000 |
| Residual                   | 183.011        | 0.187       |          |       |
| Total                      | 192.341        |             |          |       |
| Regression analysis        | Coefficient    | std. err.   | <i>t</i> | Sign. |
| (Constant)                 | -0.212         | 0.114       | -1.860   | 0.063 |
| DACC                       | 1.837          | 1.187       | 1.547    | 0.122 |
| SIZE                       | 0.026          | 0.020       | 1.291    | 0.197 |
| LEV                        | 0.404          | 0.074       | 5.435    | 0.000 |
| SG                         | 0.001          | 0.004       | 0.177    | 0.859 |
| DACC and SIZE              | -0.275         | 0.219       | -1.256   | 0.209 |
| DACC and LEV               | 0.448          | 0.083       | 5.414    | 0.000 |
| <i>R</i>                   | 0.220          |             |          |       |
| <i>R</i> square            | 0.049          |             |          |       |
| Adjusted <i>R</i> square   | 0.043          |             |          |       |
| Std. error of the estimate | 0.433          |             |          |       |
| Durbin-Watson              | 1.96           |             |          |       |

Source: own study.

This provides grounds for negating the second research hypothesis. In the surveyed companies, there is a noticeable significant impact (at the acceptable level  $\alpha = 5\%$ ) of financial leverage on the formation of future *ROA* and *ROE* values, and, at the same time, a statistically significant impact of the size of business operations on future *ROE* values.

## 5. Conclusions

In the wide spectrum of financial indicators used in the assessment of the company performance, profitability analysis deserves special attention. It allows not only to determine the ability of individual assets and liabilities to generate profit, but also indirectly informs about the size of current and future benefits for shareholders from invested capital.

The empirical research allowed for the positive verification of the research hypothesis H.1, claiming that in public industrial joint-stock companies accrual-based earnings management practices statistically significantly shape the current value of *ROA* and *ROE* ratios. However, the obtained research results allow for the presumption that in the studied sample there is a significant positive association between accrual-based earnings management and current *ROA* value, and at the same time, the significant negative correlation among earnings manipulation and current *ROE* value. This explains that the variables have a relationship but they are in the opposite direction. On the contrary, the analysis of the conducted research contributed to the negative verification of the second research hypothesis H.2. The obtained research results show that in the tested companies there are statistically insignificant relationships between discretionary accruals and the future values of *ROA* and *ROE* (for the period  $t + 1$ ).

However, it should be clearly signalled that the presented research results cannot meet the condition of generalization. They merely exemplify the reflection on the impact of accrual-based earnings management practices on the company's financial performance, which in the long term should open up to a wider group of tested enterprises. It seems particularly important to examine the impact on discretionary accruals on *ROA* and *ROE* coefficients with regard to the characteristics of individual branches of industry.

## References

- Awais, M., Hunjra, A. I., Butt, S., and Ijaz, I. (2016). Earnings management and organizational performance: Pakistan vs India. *Basic Research Journal of Business Management and Accounts*, 4(9), 211-220.
- Buhovac, A. R., and Groff, M. Z. (2012). Contemporary performance measurement systems in Central and Eastern Europe: A synthesis of the empirical literature. *Journal of East European Management Studies*, (17), 68-103.

- Davidson, S., Stickney, C. P., and Weil, R. L. (1987). *Accounting: The language of business*. Sun Lakes: Thomas Horton and Daughters.
- Dechow, P., Sloan, R. G., and Sweeney, A. P. (1995). Detecting earnings management. *The Accounting Review*, 70(2), 133-168.
- DeFond, M. L., and Park, C. W. (1997). Smoothing income in anticipation of future earnings. *Journal of Accounting and Economics*, 23(2), 115-139.
- Hassan, M., and Ahmed, M. (2012). A review of dominant and emerging issues in corporate earnings management. *Southern Business Review*, 35(1), 15-36.
- Healy, P. M., and Wahlen, J. M. (1999). A review of the earnings management literature and its implications for standard setting. *Accounting Horizons*, 13(4), 365-383.
- Huang, X., and Sun, L. (2017). Managerial ability and real earnings management. *Advances in Accounting*, (39), 91-104.
- Jamkarani, R. G., and Hozi, T. (2016). Relationship Between the Accrual-Based Earnings Management and Future Financial Performance. *International Business Management*, 10(6), 1013-1019.
- Kohlbacher, M., and Reijers H. A. (2013). The effects of process-oriented organizational design on firm performance. *Business Process Management Journal*, 19(2), 245-262.
- Kołosowska, B., Chojnacka, E., Tokarski, A., and Tokarski M. (2012). *Strategie finansowania działalności przedsiębiorstw*. Warszawa: Oficyna a Wolters Kluwer Business.
- Krajewski, M., (2012). Kierunki oceny zarządzania wynikiem finansowym przedsiębiorstw. *Annales Universitatis Mariae Curie-Skłodowska, XLVI, 1 Sectio H*, 107-113.
- Lopes, A. P. (2018). Audit quality and earnings management: Evidence from Portugal. *Athens Journal of Business & Economics*, 4(2), 179-192.
- McKee, T. H. (2005). *Earnings Management. An Executive Perspective*. Indianapolis: Thomson.
- Niemiec, A. (2016). *System pomiaru dokonań w przedsiębiorstwach*, Warszawa: CeDeWu.
- Piosik, A. (2016). *Kształtowanie wyniku finansowego przez podmioty sprawozdawcze w Polsce*, Katowice: Wydawnictwo Uniwersytetu Ekonomicznego.
- Ronen, J., and Yaari, V. (2008). *Earnings Management: Emerging Insights in Theory, Practice, and Research*. New York: Springer.
- Schipper, K. (1989). Commentary on Earnings Management. *Accounting Horizons*, (3), 91-103.
- Świdarska, G., and Więclaw, W. (2012). *Sprawozdanie finansowe według polskich i międzynarodowych standardów rachunkowości*. Warszawa: Difin.
- Umobong, A., and Ogbonna G. N. (2017). The Effect of Income Smoothing and Earnings Quality on Financial Performance of Firms. *International Journal of Business & Law Research*, 5(1), 17-29.
- Wójtowicz, P. (2010). *Wiarygodność sprawozdania finansowego wobec aktywnego kształtowania wyniku finansowego*. Kraków: Wydawnictwo Uniwersytetu Ekonomicznego.