## Michał Comporek

University of Lodz, Department of Business Analysis and Strategy
e-mail: michal.comporek@uni.lodz.pl
ORCID: 0000-0002-1402-2505

# THE RELATIONSHIP BETWEEN REAL EARNINGS MANAGEMENT AND OPERATIONAL FINANCIAL SECURITY IN INDUSTRIAL LISTED COMPANIES

**Abstract:** A company's financial result is a multidimensional and diverse category of primary importance for the continuation and development of the business entity's activity. The varied expectations of individual groups of enterprise stakeholders regarding the quality of information contained in the reported data imply that managers often face various types of market and contractual 'challenges' affecting the directions and scale of the intentional shaping of the company's financial results. The main purpose of the paper is to present the relationships between real earnings management practices and the operational financial security of industrial listed companies. The research was carried out on a sample of 72 public enterprises classified into twelve industries whose shares were traded on the Warsaw Stock Exchange for at least twelve years in the period 2003-2018.

**Keywords:** real earnings management, operational financial security, industrial enterprises, Warsaw Stock Exchange.

## 1. Introduction

Real earnings management (REM) appears as a departure from normal operational practices, motivated by managers' desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations (Roychowdhury, 2006, p. 367). Apart from the motives and reasons for REM in an economic entity, it seems right to state that each time the main goal of

implementing this type of earnings management is to present the financial situation of the company in a 'better light' in the eyes of its stakeholders.

The analysis of REM's impact on the prism of the company's financial performance may be particularly important from the perspective of assessing the company's financial security, identified with the level of financial position, which provides a stable security of its strategic and balanced financial interests from identified real and potential, external and internal threats, the parameters of which are determined on the basis of its financial philosophy, and create the necessary preconditions of financial support of its sustainable growth in current and future periods (Blank, 2013; Delas, Nosova, and Yafinovych, 2015, p. 253). The development and maintenance of the required level of financial security is a prerequisite to provide the company with a sense of certainty in its functioning, while guaranteeing its preservation in the near future. It is also a *sine qua non* condition of fulfilling other overarching goals of the enterprise, with the maximization of benefits for its owners by achieving the highest possible return on invested capital.

The main purpose of the study is to examine the relationships between the scale and directions of total REM practices (measured by the Roychowdhury methodology) and diagnostic variables illustrating the level of operational financial security of industrial public companies (which include: financial liquidity, current asset productivity, operating profitability and implemented strategies for managing short-term reserves). The set research goal was operationalized by the hypothesis claiming that in industrial enterprises listed on the Warsaw Stock Exchange, the implemented REM practices have a negative impact on the operational financial security of these companies. A broader description of the research procedure and methodology is expressed in a further part of the paper.

## 2. Real earnings management – definition and main features

One of the most holistic approaches to defining the phenomenon of earnings management identifies it with 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 a (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 (Piosik, 2016, p. 20). The highlighted research perspective allows to separate two main interpretative contexts of purposeful shaping of the financial result. One of them, referring to the REM concept, still seems to be insufficiently recognized and differently perceived in the literature on the subject matter. This remark can be highlighted, among others, in the presented examples of the heterogeneous approaches to terminology of REM practices (Table 1).

**Table 1.** Selected definitions of REM found in accounting or financial literature

| Author(s) | Definition of real earnings management |
|---|---|
| Schipper (1989) | *Real earnings management is accomplished by timing the investment or financing decisions to alter the reported earnings or some subset of it.* |
| Janin (2000) | *Real transaction-based earnings management is a business activity with a direct influence on future operating cash flows.* |
| Ewert, Wagenhofer (2005) | *Real activities management occurs when managers undertake transactions that are inefficient from the firm's perspective, but generate a desired profit or loss in the current period.* |
| Roychowdhury (2006) | *Real earnings management is defined as "departures from normal operational practices, motivated by managers' desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations".* |
| Sellami (2015) | *Real activities management is defined as a "change on the timing or structuring of management decision (real business decisions related to the operating, investing or financing activities), that have a direct impact on cash flows and thus in earnings, motivated by managers' desire to mislead stakeholders about the real performance of the company".* |
| Huang, Sun (2017) | *Real earnings management is defined 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 expenditure, research and development expenditure, selling, general and administrative expenditures) to improve reported margins. In other words, real earnings management is the management action that deviates from normal business practices and has suboptimal business consequences.* |

Source: own study.

Business practices that fall under the concept of REM are clearly different from accrual-based earnings management, based on solutions that use flexibility in the selection of accounting policies. Primarily, their characteristic features are: more difficult and cost-intensive implementation; clearly negative consequences for the future value of enterprise, lower risk of detecting the 'intentionality' of low motives of actions taken; possibility of implementation throughout the entire accounting year, or the limited scope of external control (Comporek, 2019, p. 144; Vladu, 2015, p. 414). Due to the fact that REM activities are not in practice subject to the jurisdiction of any existing control system, they are less frequently the object of external monitoring by society, the media, etc., and negatively affect the future financial results of the company, their implementation seems to be clearly harmful from the perspective of the company's financial security. The graphical reflection of the discrepancies recorded between the two dimensions of shaping the financial result (i.e. accounting type and real type) presented in Figure 1 postulates the need for their further separate analysis in terms of: possible techniques of impact on the financial
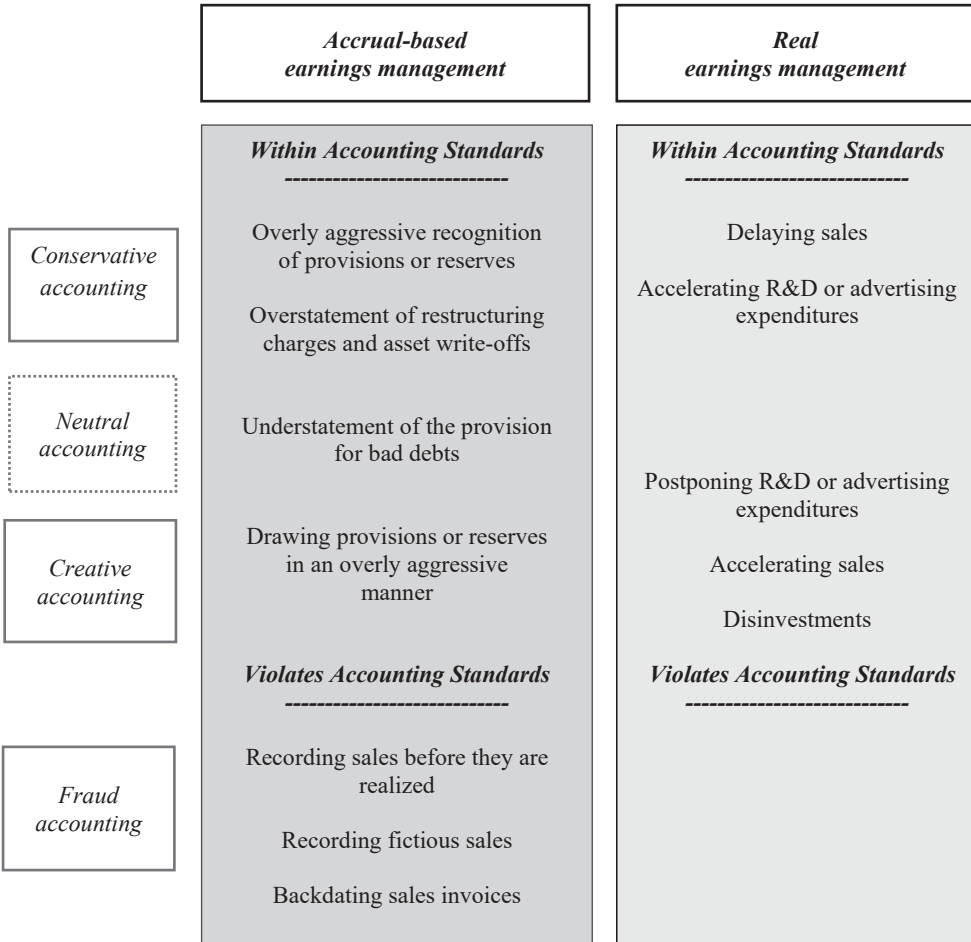
| Accrual-based earnings management | Real earnings management |
|---|---|
| **Within Accounting Standards**<br>`--------------------------` | **Within Accounting Standards**<br>`--------------------------` |
| Overly aggressive recognition of provisions or reserves<br><br>Overstatement of restructuring charges and asset write-offs | Delaying sales<br><br>Accelerating R&D or advertising expenditures |
| Understatement of the provision for bad debts | |
| Drawing provisions or reserves in an overly aggressive manner | Postponing R&D or advertising expenditures<br><br>Accelerating sales<br><br>Disinvestments |
| **Violates Accounting Standards**<br>`--------------------------` | **Violates Accounting Standards**<br>`--------------------------` |
| Recording sales before they are realized<br><br>Recording fictitious sales<br><br>Backdating sales invoices | |

Left-side labels: *Conservative accounting*, *Neutral accounting*, *Creative accounting*, *Fraud accounting*

**Fig. 2.** Placing selected earnings management activities in the spectrum of practices related to financial data manipulation

Source: own study based on: (Dechow and Skinner, 2000, p. 239).

result, applied methods of estimating earnings management, or an assessment of the influence of REM activities on the company's financial performance.

## 3. Data sample and research methodology

Empirical research was been carried out on the industrial public companies listed in the Warsaw Stock Exchange whose shares were traded for at least 12 years within the 2003-2018 reference horizon. Hence the study examined 72 listed companies

from twelve branches of industry, providing a sample of 1113 observations. The conducted research is based on the Notoria Service SA database.

The first stage of empirical research was aimed at assessing the scope and directions of REM practices in the studied sample. For this purpose, the authors was used a holistic approach proposed by Rochowdhury (2006), which allows to separate three perspectives for REM activities by distinct econometric models and, finally, extract:

- abnormal level of cash flow from operations (*OCF_EM*), whose value represents the residual component of the model describing the shaping of operational cash flows using such exogenous variables as: sales revenues and change in sales revenues, represented by the equation:

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

where: $OCF_{i,t}$ – operating cash flows of company $i$ in year $t$; $REV_{i,t}$ – sales revenues of company $i$ in year $t$; $TA_{i,t}$ – mean value of total assets of company $i$ in year $t$; $a_i$, $i = 0,1, \ldots, k$ are specific regression parameters while $\varepsilon_{i,t}$ denotes error term in the regression model.

- abnormal level of production cost (*PROD_EM*), estimating by using the following regression model:

$$\frac{PROD_{i,t}}{TA_{i,t-1}} = \alpha_0 + \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{REV_{i,t}}{TA_{i,t-1}}\right) + \alpha_3\left(\frac{\Delta REV_{i,t}}{TA_{i,t-1}}\right) + \alpha_4\left(\frac{\Delta REV_{i,t-1}}{TA_{i,t-1}}\right) + \varepsilon_{i,t},$$

where: $PROD_{i,t}$ – production costs (including: cost of goods sold and value of goods and materials sold at purchase prices increased by a change in inventories) of company $i$ in year $t$; other designations – as above.

- abnormal level of discretionary expenses (*DISC_EM*), calculated as the difference between the forecasted value and the actual value of discretionary expenses of the enterprise scaled with the average value of total assets from the previous period:

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

where: $DISC_{i,t}$ – discretionary expenses (equated with: sales costs, general and administrative expenses and research and development expenditures) of company $i$ in year $t$; other designations – as above.

Then the above three Roychowdhury models were used to determine the value of one coherent indicator, illustrating (in a holistic way) the scale of the implemented actions aimed at shaping the financial result by REM. The analytical formula of this measure takes the following form (see: Cohen and Zarowin, 2010, pp. 2-19; Belal, 2018, pp. 440-456):

$$TOT\_REM_{i,t} = -OCF\_EM_{i,t} + PROD\_EM_{i,t} - DISC\_EM_{i,t}.$$

This measure was calculated by multiplying OCF_EM and DISC_EM by negative one (−1) so that the larger their value, the higher their upward REM, and then adding together all the resulting amounts, plus the value of PROD_EM to derive one single comprehensive measure of REM. Given the way the TOT_REM is defined, the higher the value it yields, the higher the upward REM is expected to be for a firm (Ferentinou and Anagnostopoulou, 2016, p. 11).

In turn, diagnostic imaging of operational financial security of industrial enterprises was carried out using thirteen economic ratios, more widely exposed, among others by Karbownik (2014, pp. 23-66). The analytical formulas of these indicators are more precisely presented in Table 2:

**Table 2.** Measures used to assess the operational financial security of industrial enterprises

| Indicator | Analytical formula | Indicator's character | Designation |
|---|---|---|---|
| Current ratio | $CA_t / CL_t$ | accrual | *m1* |
| Quick ratio | $(CA_t - Inv_t - SDE_t)/CL_t$ | accrual | *m2* |
| Cash ratio | $STI_t/CL_t$ | accrual | *m3* |
| Operating-cash-flow-to-current-liabilities ratio | $OCF_t /CL_t$ | cash | *m4* |
| Productivity of current assets ratio | $REV_t/CA_t$ | accrual | *m5* |
| Profit margin on sales ratio | $PoS_t /REV_t$ | accrual | *m6* |
| Return on current assets ratio | $PoS_t/TA_t$ | accrual | *m7* |
| Operating-cash-flow-to-sales-revenues ratio | $OCF_t/REV_t$ | cash | *m8* |
| Operating-cash-flow-to-total-assets ratio | $OCF_t/TA_t$ | cash | *m9* |
| Financial collateral with short-term reserves (provisions) ratio 1 | $SR_t/TA_t$ | accrual | *m10* |
| Financial collateral with short-term accrued liabilities ratio 1 | $SAL_t/TA_t$ | accrual | *m11* |
| Financial collateral with short-term reserves (provisions) ratio 2 | $\Delta SR_t/TA_t$ | cash | *m12* |
| Financial collateral with short-term accrued liabilities ratio 2 | $\Delta SAL_t/TA_t$ | cash | *m13* |

where: $CA_t$ – mean value of current assets in the year $t$, $Inv_t$ – mean value of inventory in the year $t$, $SDE_t$ – mean value of accruals and prepaid expenses in the year $t$, $STI_t$ – mean value of short--term investments in the year $t$, $CL_t$ – mean value of current liabilities in the year $t$, $PoS_t$ – profit (loss) on sales in the year $t$, $SR_t$ – mean value of short-term reserves (provisions) in the year $t$, $SAL_t$ – mean value of short-term accrued liabilities in the year $t$; other designations – as above.

Source: own study.

Furthermore, the executed analyses were based on the ordinary-least-square regression (OLS), ANOVA tests and Spearman rank correlation coefficients. In the paper, the following interpretation of calculated correlation coefficients should be adopted, namely:

- $r = 0$ – no correlation,
- $0 < |r| < 0.2$ – practically no correlation between the examined variables,
- $0.2 \leq |r| < 0.4$ – correlation clear, but low,
- $0.4 \leq |r| < 0.7$ – moderate correlation,
- $0.7 \leq |r| < 0.9$ – significant correlation,
- $|r| \geq 0.9$ – correlation very strong,
- $r| = 1$ – full correlation (Ostasiewicz, Rusnak, and Siedlecka, 2001, p. 311).

## 4. Empirical results

The results of the correlation analysis carried out for all the analyzed listed companies indicate that the relations between the implemented REM practices and operational financial security have a different strength (see Tables 3 and 4). Focusing on the relationships between real earnings management and the following areas: financial liquidity, productivity and profitability of conducted business activity (Table 3), first of all it is necessary to emphasize the occurrence of the clear correlations reported in the case of the relationship between the TOT_REM ratio and operating-cash-flow--to-current-liabilities ratio (*m4*). The strength of this negative relationship, measured by the Spearman rank correlation coefficients, was 36.7%. In turn, statistically significant correlations, however those with very low power, were proved in three other cases, namely between: TOT_REM ratio and cash ratio (m3), TOT_REM indicator and profit margin on sales ratio (*m6*) and TOT_REM and return on current assets ratio (*m7*). In-depth empirical studies on the relationships occurring between the analysed variables in public enterprises belonging to particular sector indices show the existence of differences in the nature and strength of the tested correlations. In general terms, the most frequently observed statistically significant relationships include the relationships between real earnings management and cash financial liquidity ratios (*m4*). At the same time, there were no statistically significant connections between REM practices and current ratio, quick ratio as well as the productivity of current assets ratio.

Further analysis of Table 4 indicates several other findings worthy of comment. It should be emphasized that in the entire surveyed group of enterprises there were statistically significant relationships (with clear or moderate power, $|r| > 0.4$) between TOT_REM indicator and cash sufficiency ratios (*m8* and *m9*). These relationships were also statistically confirmed in the cross-sectoral analysis, although – depending on the analyzed industry sector – the strength of correlations between considered variables could vary considerably. Generally, a negative correlation of TOT_REM ratio with operating-cash-flow-to-sales-revenues ratio (m*8*) and operating-cash-flow-

**Table 3.** Relationship between total real earnings management (TOT_REM) and selected financial liquidity, productivity and profitability ratios, investigated using the Spearman rank correlation coefficient

| Branch of industry | Current ratio (*m1*) | Quick ratio (*m2*) | Cash ratio (*m3*) | Operating-cash-flow-to--current-liabilities ratio (*m4*) | Productivity of current assets ratio (*m5*) | Profit margin on sales ratio (*m6*) | Return on current assets ratio (*m7*) |
|---|---|---|---|---|---|---|---|
| Total industrial companies | –0.011 | –0.014 | **–.070**\* | **–.367**\*\* | 0.052 | **–.187**\*\* | **–.167**\*\* |
| Chemical industry | 0.014 | –0.011 | –0.047 | **–.509**\*\* | 0.064 | **–.384**\*\* | **–.329**\* |
| Wood industry | 0.003 | –0.025 | –0.081 | **–.312**\*\* | –0.092 | –0.229 | –0.222 |
| Electromechanical industry | –0.073 | –0.070 | **–.161**\* | **–.466**\*\* | 0.068 | –0.146 | **–.188**\* |
| Pharmaceutical industry | 0.160 | 0.220 | 0.065 | **–.610**\*\* | 0.031 | 0.022 | –0.043 |
| Light industry | –0.105 | –0.073 | –0.144 | **–.407**\*\* | 0.007 | **–.256**\* | –0.213 |
| Building material industry | –0.071 | 0.006 | 0.070 | **–.292**\*\* | 0.101 | –0.080 | –0.062 |
| Metal industry | 0.026 | 0.027 | –0.039 | **–.327**\*\* | 0.053 | –.220\*\* | **–.179**\*\* |
| Automotive industry | –0.231 | –0.161 | –0.172 | **–.295**\* | 0.167 | –0.196 | –0.180 |
| Fuel industry | 0.140 | 0.099 | –0.015 | **–.539**\*\* | 0.051 | **–.445**\* | **–.484**\*\* |
| Food industry | 0.101 | 0.081 | 0.105 | **–.297**\*\* | –0.042 | –0.098 | –0.043 |
| Raw material industry | –0.257 | –0.275 | –0.304 | **–.521**\* | 0.232 | –0.432 | –0.339 |
| Plastics industry | –0.140 | –0.130 | **–.379**\*\* | **–.555**\*\* | 0.127 | **–.451**\*\* | **–.403**\*\* |
| \* Statistically significant relationships at significance level α = 0,05.  \*\* Statistically significant relationships at significance level α = 0,01. | | | | | | | |

Source: own study based on financial information from the *Notoria Serwis SA* database.

-to-total-assets ratio (*m9*) adversely indicates the impact of REM's practices on the entity's financial security in the area of cash efficiency. On the contrary, referring to the relationship between the TOT_REM indicator and financial collateral with short-term reserves (provisions) and accrued liabilities ratios, it should be noted that statistically significant relationships (usually in a negative direction) were noted in relation to companies belonging to selected branches of industry.

**Table 4.** Relationship between total real earnings management (TOT_REM) and selected financial collateral with short-term accrued liabilities and reserves (provisions) ratios, investigated using the Spearman rank correlation coefficient

| Branch of industry | Operating-cash-flow-to-sales-revenues ratio (m8) | Operating-cash-flow-to-total-assets ratio (m9) | Financial collateral with short-term reserves (provisions) ratio 1 (m10) | Financial collateral with short-term accrued liabilities ratio 1 (m11) | Financial collateral with short-term reserves (provisions) ratio 2 (m12) | Financial collateral with short-term accrued liabilities ratio 2 (m13) |
|---|---|---|---|---|---|---|
| Total industrial companies | −.420** | −.392** | −0.007 | −0.041 | −0.002 | −.075* |
| Chemical industry | −.489** | −.517** | 0.117 | 0.085 | −0.077 | 0.097 |
| Wood industry | −.419** | −.364** | −0.169 | −0.095 | 0.067 | 0.013 |
| Electromechanical industry | −.519** | −.557** | −0.005 | 0.043 | −0.048 | −.200** |
| Pharmaceutical industry | −.571** | −.613** | .409** | 0.031 | −0.129 | −.380* |
| Light industry | −.417** | −.372** | −0.124 | −.394** | 0.068 | 0.086 |
| Building material industry | −.360** | −.295** | 0.050 | −0.034 | 0.057 | −0.156 |
| Metal industry | −.388** | −.353** | −0.018 | −0.032 | 0.018 | −0.022 |
| Automotive industry | −.318* | −.319* | −0.047 | 0.200 | 0.227 | −0.112 |
| Fuel industry | −.530** | −.521** | 0.108 | −0.132 | −0.033 | −.523** |
| Food industry | −.358** | −.275** | −0.074 | −0.011 | −0.029 | 0.056 |
| Raw material industry | −.711** | −.475* | 0.401 | 0.248 | 0.145 | 0.072 |
| Plastics industry | −.655** | −.534** | −0.090 | −0.093 | 0.002 | −0.144 |

\* Statistically significant relationships at significance level $\alpha = 0{,}05$.
\*\* Statistically significant relationships at significance level $\alpha = 0{,}01$.

Source: own study based on financial information from the *Notoria Serwis SA* database.

# 5. Conclusion

A company financial result are one of the most important economic categories that can be considered as a fundamental verifier of the company's effectiveness in the market and an important criterion for assessing the efficiency of its management. Since the enterprise throughout the entire period of its operation remains under constant

assessment by various groups of enterprise stakeholders (i.e. owners, managers, the Treasury, banks, employees and creditors, etc.), there may be a temptation to artificially interfere in the value of the reported financial results. One of the paths for this type of harmful activities is REM.

The results of the empirical research presented in the paper allowed for the positive verification of the hypothesis that in industrial enterprises listed on the Warsaw Stock Exchange, the implemented REM practices have a negative impact on the operational financial security of these companies. The increase in the scale of REM practices contributes to the reduction of the company's cash liquidity, and also negatively affects its operating profitability and cash sufficiency. It is worth emphasizing that in the examined sample, the strength of statistical dependencies between REM indicators and the analysed operational financial security ratios was characterized by significant industry diversity. Particularly noteworthy is the strong correlation of the TOT_REM indicator with the measures of operational financial security, especially for companies in the electromechanical, pharmaceutical, fuel, raw material and plastics sectors.

A separate issue is the fact that the conducted research does not answer the question of whether the industry differences in shaping the relationship between the described variables are a derivative of the industry differentiation of technical and technological processes of production and market conditions of their operation, or the adopted strategies to stimulate the financial result in individual enterprises (e.g. the sampled firms can maintain individualized accruals patterns over time and even companies within the same branch of industry have varying characteristics).

The presented research results cannot fulfil the condition of generalization. They contain partial results, opening up prospects for further research on the determinants of real management practices, primarily taking into account the comprehensive comparison of the specifics of enterprises operating in various industries.

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## RELACJE MIĘDZY REALNYM ZARZĄDZANIEM ZYSKIEM A OPERACYJNYM BEZPIECZEŃSTWEM FINANSOWYM PRZEMYSŁOWYCH SPÓŁEK GIEŁDOWYCH

**Streszczenie:** Wynik finansowy przedsiębiorstwa jest wielowymiarową i zróżnicowaną kategorią o podstawowym znaczeniu dla kontynuacji i rozwoju działalności podmiotu gospodarczego. Zdywersyfikowane oczekiwania poszczególnych grup interesariuszy przedsiębiorstwa względem zakresu i jakości informacji zawartych w raportowanych danych powodują, iż menedżerowie niejednokrotnie stają w obliczu różnych rodzajów rynkowych i kontraktowych „wyzwań" wpływających na kierunki i skalę intencjonalnego kształtowania wyniku finansowego. Zasadniczym celem artykułu jest ukazanie relacji między praktykami z zakresu realnego zarządzania zyskiem a operacyjnym bezpieczeństwem finansowym przemysłowych spółek giełdowych. Badania empiryczne przeprowadzono na próbie 72 publicznych przedsiębiorstw zaklasyfikowanych do grona dwunastu branż przemysłu, których akcje były przedmiotem obrotu na Giełdzie Papierów Wartościowych w Warszawie przez co najmniej dwanaście lat w przyjętym horyzoncie odniesienia 2003-2018.

**Słowa kluczowe:** realne zarządzanie zyskiem, operacyjne bezpieczeństwo finansowe, spółki giełdowe, Giełda Papierów Wartościowych w Warszawie.