DOI: 10.55643/fcaptp.5.58.2024.4540

Michał Comporek
D.Sc. in Economics, Associate Professor of the Department of Business Analysis and Strategy, University of Lodz, Łódź, Poland;
e-mail: michal.comporek@uni.lodz.pl
ORCID: 0000-0002-1402-2505

ESG SCORES, EARNINGS MANAGEMENT AND FINANCIAL PERFORMANCE: EVIDENCE FROM POLAND

ABSTRACT

The paper's main aim is to investigate the relationship between the ESG activities scores and profitability metrics of 33 public companies listed on the Warsaw Stock Exchange. By utilizing the Refinitiv methodology, we answer whether a company's environmental, social and governance performance perspectives positively affect the ROA, ROE and ROC ratios or whether there is a negative relationship. A secondary objective of the research is to investigate the relationship between profitability and the magnitude of aggregate-based earnings management in the tested sample. The moderating effect of earnings manipulation on the links between ESG performance and a company's profitability metrics is a research gap that has not been well-studied to date.

This research demonstrates contradictory results: a positive relationship between the social dimension of ESG activities and the financial performance of companies was observed regarding ROE and ROC ratios. The negative impact of the environmental pillar rank on the ROA ratio was captured only in selected regression analyses. The governance pillar score did not statistically affect the tested profitability metrics. On the other hand, we gathered evidence that public companies with a high range of non-financial disclosures tend to alter earnings via accruals, and discretionary accruals statistically affect the ROA, ROE and ROC ratios. These finding contrasts previous research claiming that the earnings management phenomenon is a typical agency problem and that the policy of non-mandatory disclosures following the ESG assumptions could constrain the asymmetry of information and managerial information advantages.

Keywords: ESG, profitability, financial performance, earnings management, Warsaw Stock Exchange

JEL Classification: G32, M40

INTRODUCTION

Modern accounting requirements encourage companies to disclose environmental, social, and governance (ESG) performance information. Growing reporting obligations and the pressure to meet the information needs of all enterprise stakeholders contribute to the progressive development of social accounting on the micro-scale and its subsystems (Gray, 2001). They also allow for minimizing the conservative weaknesses of financial accounting, which do not adequately present how the company integrates with the society and environment in which it operates.

The increased awareness of ESG issues in modern business is reflected in the ongoing interest of investors in ESG-friendly assets (Siwiec and Karkowska, 2024), the development of ESG funds on global markets and the general perception of ESG considerations as an important opportunity for value creation (Mikołajek-Gocejna, 2024). However, the prior studies on the relationship between ESG activity and the company's financial performance provide inclusive findings. Some researchers demonstrate that greater transparency around ESG cuts capital constraints by reducing agency costs and informational asymmetry (Chang et al., 2014). It also positively affects stock returns (Chouaibi et al., 2022) and corporate efficiency (Xie et al., 2019). In contrast, others show the negative impact of ESG scores on generated free cash flows (Garcia and Orsato, 2020) and highlight the opportunities for inefficient capital allocation through investing in ESG activities

Received: 24/08/2024
Accepted: 17/10/2024
Published: 31/10/2024

(Haans et al., 2016). As noted by Berg et al. (2020) and Mikołajek-Gocejna (2024), the ambiguity of empirical results arises from the lack of consistent interpretation of ESG performance and methodology of its estimation and the use of diversified sources and reporting standards to score the magnitude of ESG activities.

At the same time, an important feature of the capital market is the obligation of companies to announce high-quality reported data. Executives tend to alter them in a deliberate way to meet stakeholders' expectations or achieve private benefits (Bachtijeva and Tamulevičiené, 2022). Accrual categories on a firm's profitability are particularly susceptible to intentional manipulation by managers. Beneish (2001) pointed out that the motives encouraging executives to manage earnings upward are loan agreements, management contracts, IPOs, SEOs and insider trading. On the other hand, managers strive to alter earnings downward before management buyouts and planned negotiations with trade unions. Regardless of the premises and directions of earnings management activities, poor quality of information describing the company's financial performance leads to lower information efficiency of the market and non-optimal decisions by investors. Hence, we are looking for an answer to the relationship between profitability metrics and earnings management in public companies that provide above-average non-financial disclosures. Demonstrating the moderating effect of earnings manipulation on the correlation between ESG performance and a company's profitability is a novelty of the paper.

This article fills the literature gap in research on reporting from corporate governance, environmental and social perspectives, which is still in its infancy concerning the Polish capital market. Undertaken analyses may interest wide groups of company stakeholders who seek information necessary to understand the firm’s development, generated profits, and connections with external conditions. By including the issue of earnings quality, these presented findings could also attract the attention of legislative bodies regulating financial reporting and auditing.

LITERATURE REVIEW

ESG performance and company’s profitability

The ESG concept is related to considering environmental, social and corporate governance aspects in investors' portfolio decisions (Matos, 2020). As Huang (2019) notes, the rationale for implementing ESG is the obligation to do good by companies. In turn, from an investor perspective, ESG can be perceived as a strategy outsiders use to assess corporate behaviour and the future financial performance of a company (Li et al., 2021).

Previous research has extensively investigated the relationships between ESG ratings and firms' financial performance. However, the vast majority of academic achievements refer to developed markets where environmental and social reporting has been growing for years. A closer look at studies on the impact of sustainable development activities on the profitability of public companies allows us to distinguish two groups of studies: those emphasizing positive and mixed links between the considered categories.

Zhao et al. (2018), based on 20 large listed power generation companies in China, discovered that ESG performance significantly and positively affects the return on capital employed (ROCE) ratio. Dalal and Thaker (2019) found positive associations between ESG scores and return on assets (ROA) ratio among 65 Indian firms listed on the NSE 100 ESG Index database. Using diverse methodological approaches, Hamdi et al. (2022) demonstrated that the effect of lagged ROA and ROE ratios on ESG performance in US companies is always positive and statistically significant. Siwiec and Karkowska (2024) evidenced the existence of a positive link between the evaluation of ESG practices and the ROA ratios in the case of 48 joint-stock companies operating in the Central and Eastern European Region. Similar observations regarding German and Turkish companies were presented by Velte (2017) and Özer et al. (2023). Kouzez et al. (2024) explored that higher engagement in ESG activities may contribute to the better financial performance of European lenders. However, this rule only applies to foreign-owned banks that see ESG investments as a tool for achieving legitimacy in foreign markets and strengthening their reputation. Bui et al. (2024) presented similar conclusions regarding Vietnamese commercial banks. Based on the Fair Finance Guide Methodology, they demonstrated positive effects of the overall ESG policy and environmental and governance disclosures on the ROE ratios in 2018-2022.

In contrast, Nollet et al. (2016), who examined 500 large-cap companies traded on American stock exchanges, suggested the occurrence of no significant relationships between corporate social performance and ROA and ROC ratios. Moreover, they provided evidence of mixed and U-shaped links between CSR activities and corporate financial performance. Tancke et al. (2023) confirmed no significant relationship between ESG performance and ROA ratio in the largest car manufacturers. They showed that in the tested sample, only one sub-component of the overall ESG score (social pillar) has a contradicting effect on the ROA ratio. Saha and Khan (2024) highlighted that ESG score has a contradictory impact on ROA and ROE ratios in Nordic companies. They showed that the country- and industry-level affect the relationships between the

DOI: 10.55643/fcaptp.5.58.2024.4540

above variables. For example, the relationship between ESG score and ROE in telecommunications, energy and utility companies is significantly negative, while for companies from the healthcare and basic materials sectors - significantly positive. Xie et al. (2019) showed that the impact of ESG performance on the profitability of companies from 74 countries depends on the scope of ESG disclosures. They demonstrated that a moderate disclosure level of ESG information has a significant and positive effect on corporate financial efficiency, in contrast to a high or low disclosure level. Moreover, they gathered evidence that ESG activities have non-negative relationships with the ROA ratio, and their direction strictly depends on the nature of the ESG disclosures. Agnese et al. (2023) confirmed positive correlations between ESG controversies and European banks' profitability during 2015-2022. They gathered evidence on the implementation of opportunistic behaviour of credit institutions based on alleged involvement in adverse impact activities and striving to prioritize profitability over ESG controversies. Yuen et al. (2022) highlighted that adopting good ESG standards is a significant cost for banks, reducing their profitability. They also suggested that implementing ESG activities could improve credit institutions' financial performance in the long term.

Earnings management and the company's profitability

Earnings management occurs when insiders alter a company's reported economic performance **to mislead some stakeholders or influence contractual outcomes** (Leuz et al., 2002). Incentives to manipulate earnings are related to several circumstances, ranging from the existence of explicit and implicit contracts and the need for obtaining external financing to cultural factors and regulatory environment (Gras-Gil et al., 2016). The dominant premise of manipulating earnings is the conflict of interest between managers and owners of the firm resulting from the agency theory. Managers tend to use control over entrusted resources to achieve private benefits at the expense of other stakeholders. When detecting unauthorized behaviours, the company's management could be disciplined. For this reason, executives are motivated to hide information about earnings management, even if these practices do not involve breaking accounting rules (Healy and Wahlen, 1999). On the other hand, the bonus plan hypothesis (Watts and Zimmerman, 1990) states that managers whose compensation is dependent on the results achieved by the company, are more likely to abandon conservative accounting policies, focusing on distortion the firm's profitability upward in the short term, using appropriate accounting techniques.

Preparing a classification of potential paths of accrual-based earnings management (AEM) is difficult because each accounting method or each estimate may have an integral connection with earnings manipulation. Moreover, in many cases, the implementation (one-time or aggregate) of earnings management may be aimed at achieving various goals from a specific moment of the company's functioning on the market. From the tool point of view, AEM involves the registration, recording and presentation of economic events using a creative interpretation of the applicable accounting principles (Ewert and Wagenhofer, 2005), and these procedures may result in both shifting revenue and cost streams in time (direct management) and misreporting (Degeorge et al., 1999).

The studies on the relationship between firms' profitability and AEM are part of the research trend concerning firm-specific parameters determining the magnitude of earnings manipulation. However, prior empirical analyses of the impact of earnings management on a company's profitability provide inconclusive results. Hanum et al. (2023), based on public companies from the Indonesian Stock Exchange, demonstrated positive relationships between earnings management and ROE and EPS (earnings per share) coefficients. In turn, they showed no relationship between the magnitude of earnings manipulation and profit margin and ROA ratios. An interesting finding from their study is that companies with low sales did not affect earnings management to manipulate reported data upward. Rahman and Iskandar (2021) and Widiasmara and Saputri (2021) found that profitability explained by the ROA coefficient does not influence the extent of accrual-based earnings management activities. They explain this in two ways: Firstly, due to many regulatory bodies and regulations to oversee dysfunctional acts public companies are cautious about altering earnings. Secondly, many investors could ignore information about ROA ratios while making capital allocation decisions. Kallunki and Martikainen (2003) confirmed that lagged earnings management practices are negatively related to the future profitability of Finnish firms. They also found that earnings management lagged by one year can be seen as a source of progressive information on the company's past profitability and stock price information when predicting future profitability. In contrast, Yamaguchi (2020) discovered that Japanese companies perceive industry average profitability as an important benchmark and tend to use earnings management activities to achieve a consistent profitability level. At the same time, the positive relationship between AEM and profitability is stronger in more competitive sectors of the economy.

AIMS AND OBJECTIVES

This paper investigates the relationship between individual pillars of ESG performance of public companies listed on the Warsaw Stock Exchange and their profitability metrics. Using the Refinitiv Eikon database, we answer whether ESG activities regarding environmental, social and governance perspectives positively affect the ROA, ROE and ROC ratios or whether there is a negative relationship. A secondary purpose of the paper is to investigate the relationship between profitability and the magnitude of accrual-based earnings management in the tested sample. The moderating effect of earnings manipulation on the links between ESG performance and a company's profitability metrics is a research gap that has not been developed in the literature to date.

Based on the arguments discussed above, we formulate the following hypotheses:

1. H.1. The environmental pillar score evaluated with Refinitiv methodology positively impacts the profitability metrics of public companies traded on the WSE.
2. H.2. The governance pillar score assessed by Refinitiv methodology positively affects the profitability metrics of public companies in the tested sample.
3. H.3. The social pillar score evaluated *via* Refinitiv methodology positively impacts the profitability of listed companies traded on the WSE.
4. H.4. The magnitude of accrual-based earnings management statistically affects the profitability of public companies characterized by a high degree of non-financial disclosures.

The research sample used in this paper comprises 33 non-financial companies whose ESG performance scores were provided by Refinitiv and whose shares were continuously traded in the Main Market of the WSE from 2018 to 2022. Additionally, all companies have a fiscal year ending on 31 December, and their financial data is publicly available. Finally, our study is based on 165 observations over the five-year reference period.

METHODS

ESG performance measures

The evaluation of ESG performance was provided by the ESG scores methodology developed by Refinitiv (Refinitiv, 2022). The three crucial dimensions of ESG activities include environmental (E), social (S), and governance (G) perspectives. A detailed view of the ESG themes covered in each category allows us to state that the E score takes into account the level of emissions, environmental innovation and resource utilization. The S score considers human rights, workforce, product responsibility and community issues. In contrast, the G score is based on CSR strategy, management structure, compensation and adherence to shareholder rights (Table 1). All scores assessing individual subcomponents of ESG performance are between 0 and 100, with 100 being the best possible score (Ehlers et al., 2024).

Table 1. ESG themes covered in each category by ESG score methodology developed by Refinitiv. *(Source: own elaboration based on Refinitiv (2022))*

Pillars	Categories	Abbreviation	Themes
Environment	Emission	E_E	Emissions; Waste; Biodiversity; Environmental management systems
	Innovation	E_I	Product innovation; Green revenues, research and development (R&D) and capital expenditures (Capex)
	Resource use	E_RU	Water; Energy; Sustainable packaging; Environmental supply chain
Social	Community	S_C	Equally important to all industry groups, hence a median weight of five is assigned to all
	Human rights	S_HR	Human rights
	Product responsibility	S_PR	Responsible marketing; Product quality; Data privacy
	Workforce	S_W	Diversity and inclusion; Career development and training; Working conditions; Health and safety
Governance	CSR strategy	G_CSR	CSR strategy; ESG reporting and transparency
	Management	G_M	Structure (independence, diversity, committees); Compensation
	Shareholders	G_S	Shareholder rights; Takeover defences

DOI: 10.55643/fcaptp.5.58.2024.4540

However, our study also includes an additional attribute distinguished in the Refinitiv Eikon database as an important feature of the company's sustainable development: the long-term return pillar (L). The L score reflects not only the long-term orientation of public companies but also includes issues of earnings quality region rank and credit combined region rank.

Accrual-based earnings management measures

The magnitude of accrual-based EM activities is estimated in three ways. Firstly, we used the Modified Jones model (Dechow et al., 1995), which is characterized by high explanatory power (Callao et al., 2017) and, due to its popularity ensures comparability with empirical findings presented by other researchers (Ali et al., 2022; Uddin, 2023). We estimate individual subcategories of accruals *via* a time series data approach, assuming that earnings management patterns are specific to each company (Taleatu et al., 2020). In this research, total accruals are a function of (Comporek, 2021):

- the change in cash-accruals revenue (ΔREV-ΔREC), reflecting changes in current accruals;
- depreciation expenses (PPE), controlling for any non-discretionary accrual changes related to depreciation expenses.

The Modified Jones model (1995) adopts the following formula (Equation 1):

$$\frac{TACC_t}{TA_{t-1}} = \alpha_1\left(\frac{1}{TA_{t-1}}\right) + \alpha_2\left(\frac{\Delta REV_t - \Delta REC_t}{TA_{t-1}}\right) + \alpha_3\left(\frac{PPE_t}{TA_{t-1}}\right) + \varepsilon_t, \quad (1)$$

where: $TACC_t$ – total accruals in period t (determined by the balance sheet approach or the cash flow approach); TA_t – total assets in year t; REV_t – revenues from sales in year t; REC_t – net receivables in year t; PPE_t – gross property, plant and equipment in year t; $\alpha_1, \alpha_2, \alpha_3$ – a firm-specific parameter (in the regression model); ε_t – a random error.

Secondly, in this research, we used the Shivakumar model (1996), which includes the operating cash flows as an additional explanatory variable. As indicated by previous studies (Comporek, 2019), accrual-based earnings management models based on cash flow statements may demonstrate better goodness-of-fit to the empirical data than the original version of the Jones model (1991). The Shivakumar model (1996) presents the following formula (Equation 2):

$$\frac{TACC_t}{TA_{t-1}} = \alpha_1\left(\frac{1}{TA_{t-1}}\right) + \alpha_2\left(\frac{\Delta REV_t}{TA_{t-1}}\right) + \alpha_3\left(\frac{PPE_t}{TA_{t-1}}\right) + \alpha_4\left(\frac{CFO_t}{TA_{t-1}}\right) + \varepsilon_t, \quad (2)$$

where: CFO_t – cash flow from operating activities in period t; other designations – as above.

Thirdly, for research purposes, we adopt the Dechow et al. model (2003), which includes a slope coefficient *k* that captures the expected change in accounts receivable for a given change in sales. If *k* = 1, the annual change in accounts receivable is nondiscretionary, whereas if *k* = 0, it is discretionary. The slope coefficient k is calculated as a parameter in this regression (Equation 3).

$$\Delta REC_t = \alpha_1 + k * \Delta REV_t + \varepsilon_t, \quad (3)$$

where: k – slope coefficient evaluating the expected change in accounts receivable for a given change in sales in period t; other designations – as above.

Thus, the Dechow et al. model (2003) eliminates the major drawback of the Modified Jones model (1995), in which any increase in receivables is treated as discretionary, which does not reflect the realities of economic transactions. The formula of the Dechow et al. model (2003) is presented as follows (Equation 4):

$$\frac{TACC_t}{TA_{t-1}} = \alpha_1\left(\frac{1}{TA_{t-1}}\right) + \alpha_2\left(\frac{(1+k) * \Delta REV_t - \Delta REC_t}{TA_{t-1}}\right) + \alpha_3\left(\frac{PPE_t}{TA_{t-1}}\right) + \alpha_4\frac{TACC_{t-1}}{TA_{t-2}} + \varepsilon_t, \quad (4)$$

We used the absolute values of discretionary accruals (DACC) to determine the magnitude of earnings management. In all three regression models used to extract particular subcategories of accruals, the value of DACC equals the random error in the examined model. When discretionary accruals deviate significantly from zero, it suggests a higher degree of accrual-based earnings manipulation in the company (Comporek, 2024).

Control variables and empirical model specification

We use the ordinary least square (OLS) with robust standard errors to investigate the relationships between tested variables. Firstly, we developed a model that examined the influence of ESG performance on companies' profitability metrics. The formula of the adopted model is as follows (Equation 5):

$$\begin{bmatrix} ROA_t \\ ROE_t \\ ROC_t \end{bmatrix} = \alpha_0 + \alpha_1 E_t + \alpha_2 S_t + \alpha_3 G_t + \alpha_4 L_t + \sum_{i=1}^{n=4} CONTROL\ VARIABLES + \varepsilon_t \quad (5)$$

where: E_t – environmental pillar performance in period t; S_t – social pillar performance in period t; G_t – governance pillar performance in period t; L_t – long-term returns pillar score in period t; other designations – as above.

Secondly, we improved the earlier regression model by including the variable describing earnings management's magnitude. In this way, we demonstrated the moderating effect of earnings manipulation on the correlation between ESG rankings and public companies' financial performance (Equation 6):

$$\begin{bmatrix} ROA_t \\ ROE_t \\ ROC_t \end{bmatrix} = \alpha_0 + \alpha_1 E_t + \alpha_2 S_t + \alpha_3 G_t + \alpha_4 L_t + \alpha_5 \begin{bmatrix} |DACC\_MF_t| \\ |DACC\_SH_t| \\ |DACC\_DE_t| \end{bmatrix} + \sum_{i=1}^{n=4} CONTROL\ VARIABLES + \varepsilon_t \quad (6)$$

where: $DACC\_MF_t$ - discretionary accruals extracted by the Modified Jones Model; $DACC\_SH_t$ - discretionary accruals extracted by Shivakumar model; $DACC\_DE_t$ - discretionary accruals extracted by Dechow et al. (2003) model; other designations – as above.

We used the company growth opportunities (GO), asset structure (TANG), leverage (LEV) and operational risk (EVOL) as control variables to describe company-specific attributes that could affect the company's profitability (Comporek, 2024). The calculation methodology for all variables is provided in Table 2.

Table 2. Calculation methodology for variables.

Variable	Definition
Dependent variables	
ROA/ROE/ROC	Return on Assets in year t / Return on Equity in year t / Return on Capital in year t
Independent variables	
E	The environmental pillar score measured in year t obtained from the Refinitiv Eikon database
S	The social pillar score measured in year t obtained from the Refinitiv Eikon database
G	The governance pillar score measured in year t obtained from the Refinitiv Eikon database
L	The long-term return pillar score measured in year t obtained from the Refinitiv Eikon database
DACC_MF/DACC_SH/DACC_DE	Discretionary accruals are separated, respectively, by the Modified Jones model (1995) / Shivakumar model (1996) / Dechow et al. model (2003). DACC equals the difference between the empirical and theoretical total accruals (TACC) value.
Control variables	
GO	The ratio of intangible assets to total assets in year t
TANG	The share of property, plant and equipment in total assets in year t
LEV	The ratio of the company's interest-bearing debt to total assets in year t
EVOL	Relative chain increases in operating profits in year t

If any of the ESG explanatory variables proved to influence the company's profitability statistically (at a significance level of 0.05), we applied in-depth empirical tests using the division of E, S and G variables into further categories presented in Table 1.

DOI: 10.55643/fcaptp.5.58.2024.4540

RESULTS

The first stage of empirical analyses examined the relationships between the variables under consideration. The correlation matrix presented in Table 3 indicates that the correlation coefficients between tested variables are considerably low, which provides no multicollinearity problem.

Table 3. The correlation matrix between tested variables. Note: correlations significant at the 0.01 level/(2-tailed) are marked in bold.

Variable	ROE	ROA	ROC	E	S	G	L	DACC_MJ	DACC_SH	DACC_DE	TANG	GO	LEV	EVOL
ROE	1													
ROA	**0.48**	1												
ROC	**0.83**	**0.83**	1											
E	0.05	-0.09	0.01	1										
S	0.13	0.06	0.15	**0.60**	1									
G	-0.07	-0.03	-0.08	-0.10	0.01	1								
L	**0.23**	**0.28**	**0.32**	0.04	**0.19**	-0.07	1.00							
DACC_MJ	0.07	**0.21**	0.13	0.02	0.04	-0.05	0.00	1						
DACC_SH	0.05	**0.21**	0.10	-0.02	0.04	-0.01	-0.03	**0.83**	1					
DACC_DE	0.07	**0.19**	0.12	0.04	0.03	-0.06	0.01	**0.93**	**0.80**	1				
TANG	-0.06	0.01	-0.02	0.04	0.13	-0.10	0.08	0.00	0.01	0.01	1			
GO	-0.10	-0.01	-0.07	0.11	0.14	-0.06	**0.34**	-0.1	-0.12	-0.12	-0.13	1		
LEV	**0.76**	-0.06	**0.34**	0.04	0.04	0.00	0.06	-0.04	-0.03	-0.05	-0.10	-0.05	1	
EVOL	0.05	0.01	0.01	0.01	0.13	0.02	0.04	0.02	0.02	-0.02	-0.12	0.02	0.01	1

Table 4 shows the regression analysis of the impact of individual ESG pillars on profitability metrics of public companies characterized by a wide spectrum of non-financial disclosures and included in the Refinitiv Eikon database. The obtained research results show that among the three main aspects of ESG activities, only social enhancements positively influence the financial performance improvement within the examined firms. Moreover, this observation concerns only the ROC ratio. In the case of the remaining two ESG pillars (E and G), none of them significantly impact a company's profitability.

Table 4. The effect of ESG performance on profitability metrics of public companies. Note: **/* indicate significance at the 0.01/0.05 levels, respectively.

Variables	Dependent variables					
	ROA		ROE		ROC	
	B	(St. Error)	B	(St. Error)	B	(St. Error)
Intercept	-0.017	0.038	-0.145	0.087	-0.067	0.048
E	-0.001	0.000	-0.001	0.001	-0.001	0.001
S	0.001	0.001	0.002	0.001	0.001*	0.001
G	0.000	0.000	-0.001	0.001	-0.001	0.001
L	0.002**	0.000	0.004**	0.001	0.003**	0.001
TANG	-0.019	0.029	-0.064	0.067	-0.040	0.037
GO	-0.131	0.089	-0.606**	0.205	-0.299**	0.113
LEV	-0.001	0.001	0.022**	0.001	0.003**	0.001
EVOL	0.000	0.002	-0.003	0.005	-0.001	0.003
R	0.339		0.797		0.509	
R^2	0.114		0.635		0.260	
Adj. R^2	0.069		0.616		0.222	
D-W	1.918		1.941		1.942	
Sig.	0.013		<0.001		<0.001	

The regression results of the ESG performance and the extent of earnings management activities on the value of ROA ratios are presented in Table 5. Due to the diversified approaches to assessing earnings manipulation in the tested sample, we run three regression models. The results obtained regarding the impact of individual pillars of ESG on ROA ratios were ambiguous. We demonstrate negative relationships between the environmental pillar of ESG and companies' profitability only when Shivakumar (1996) and Dechow et al. (2003) models estimate the magnitude of earnings management. The inclusion of the *DACC_SH* variable in the regression model allowed for statistical confirmation that enhancements in a social pillar of ESG positively affect the ROA ratios. On the other hand, we did not find a statistically significant relationship between the governance pillar score (*G*) and ROA ratios in any of the tested models.

The Analysis of Table 5 indicates several other findings worthy of comment. Firstly, we prove that the extent of accrual-based earnings manipulation statistically influences the value of reported ROA ratios regardless of the applied model for extracting discretionary and nondiscretionary accruals. Secondly, our study confirms that the long-term returns perspective (L) positively impacts the dependent variable ROA.

Table 5. The effect of ESG performance and earnings management on ROA ratios. Note: **/* indicate significance at the 0.01/0.05 levels, respectively.

Dependent variable - ROA								
Model specification								
(1)			(2)			(3)		
Variables	**B**	**(St. Error)**	**Variables**	**B**	**(St. Error)**	**Variables**	**B**	**(St. Error)**
Intercept	-0.049	0.036	Intercept	-0.025	0.035	Intercept	-0.035	0.035
E	-0.001	0.000	E	-0.001*	0.000	E	-0.001*	0.000
S	0.001	0.000	S	0.001*	0.000	S	0.001	0.000
G	0.000	0.000	G	-0.000	0.000	G	0.000	0.000
L	0.001**	0.000	L	0.001**	0.000	L	0.001*	0.000
DACC_MJ	0.657**	0.135	DACC_SH	0.569**	0.116	DACC_DE	0.792**	0.147
TANG	0.006	0.028	TANG	-0.002	0.027	TANG	0.008	0.027
GO	-0.15	0.084	GO	-0.182*	0.084	GO	-0.160	0.082
LEV	-0.001	0.001	LEV	-0.001	0.001	LEV	-0.001	0.001
EVOL	0.000	0.002	EVOL	0.000	0.002	EVOL	0.000	0.002
R	0.482		R	0.484		R	0.505	
R^2	0.232		R^2	0.234		R^2	0.255	
Adj. R^2	0.188		Adj. R^2	0.190		Adj. R^2	0.212	
D-W	2.061		D-W	2.072		D-W	2.031	
Sig.	<0.001		Sig.	<0.001		Sig.	<0.001	

The next research stage aimed to assess the effect of ESG performance and accounting-type earnings manipulation on the ROE ratio values (Table 6). Irrespective of the applied methods of extracting particular subcategories of accruals, this study showed that firms effectively managing the social pillar of ESG achieved higher returns on equity. However, we did not demonstrate similar relationships for the other two dimensions of ESG performance: the environmental pillar score (*E*) and the governance pillar score (*G*). As before, the extent of earnings management *via* accruals and the company's long-term orientation were statistically related to the profitability of examined companies (positive links). On the other hand, our investigation suggests that firms with lower growth opportunities (*GO*) and higher leverage (*LEV*) tend to report statistically greater values of ROE ratios.

DOI: 10.55643/fcaptp.5.58.2024.4540

Table 6. The effect of ESG performance and earnings management on ROE ratios. Note: **/* indicate significance at the 0.01/0.05 levels, respectively.

Dependent variable - ROE								
Model specification								
(1)			(2)			(3)		
Variables	B	(St. Error)	Variables	B	(St. Error)	Variables	B	(St. Error)
Intercept	-0.184*	0.087	Intercept	-0.154	0.085	Intercept	-0.167	0.085
E	-0.001	0.001	E	-0.001	0.001	E	-0.001	0.001
S	0.002*	0.001	S	0.003**	0.001	S	0.003**	0.001
G	-0.001	0.001	G	-0.001	0.001	G	-0.001	0.001
L	0.004**	0.001	L	0.004**	0.001	L	0.004**	0.001
DACC_MJ	0.808**	0.326	DACC_SH	0.681**	0.280	DACC_DE	1.006**	0.357
TANG	-0.034	0.067	TANG	-0.044	0.066	TANG	-0.029	0.067
GO	-0.630**	0.202	GO	-0.667**	0.203	GO	-0.643**	0.201
LEV	0.022**	0.001	LEV	0.022**	0.001	LEV	0.022**	0.001
EVOL	-0.002	0.005	EVOL	-0.002	0.005	EVOL	-0.003	0.004
R	0.806		R	0.805		R	0.808	
R^2	0.649		R^2	0.648		R^2	0.653	
Adj. R^2	0.628		Adj. R^2	0.628		Adj. R^2	0.632	
D-W	1.962		D-W	1.967		D-W	1.951	
Sig.	<0.001		Sig	<0.001		Sig	<0.001	

Our study also confirms the existence of positive relationships between the social area of ESG and corporate profitability in the last analyzed case. When we use the ROC ratio as the dependent variable, after controlling the factors that potentially influence the firm's financial performance, we found a positive association between the ROC variable and the ESG social pillar score (*S*) (Table 7). On the other hand, we did not find a statistically significant relationship between *ROC* and environmental (*E*) and governance (G) pillar scores. Finally, we showed that the magnitude of earnings management statistically impacts the ROC ratios in the tested sample irrespective of the applied accruals models.

Table 7. The effect of ESG performance and earnings management on ROC ratios. Note: **/* indicate significance at the 0.01/0.05 levels, respectively.

Dependent variable - ROC								
Model specification								
(1)			(2)			(3)		
Variables	B	(St. Error)	Variables	B	(St. Error)	Variables	B	(St. Error)
Intercept	-0.097*	0.047	Intercept	-0.074	0.046	Intercept	-0.085	0.046
E	-0.001	0.001	E	-0.001	0.001	E	-0.001	0.001
S	0.001*	0.001	S	0.002**	0.001	S	0.002*	0.001
G	0.000	0.001	G	0.000	0.000	G	0.000	0.000
L	0.002**	0.001	L	0.002**	0.001	L	0.002**	0.001
DACC_MJ	0.632**	0.175	DACC_SH	0.517**	0.151	DACC_DE	0.787**	0.191
TANG	-0.016	0.036	TANG	-0.025	0.036	TANG	-0.013	0.036
GO	-0.317**	0.109	GO	-0.345**	0.110	GO	-0.328**	0.108
LEV	0.004**	0.001	LEV	0.004**	0.001	LEV	0.004**	0.001
EVOL	0.000	0.002	EVOL	-0.001	0.002	EVOL	-0.001	0.002
R	0.563		R	0.558		R	0.577	
R^2	0.317		R^2	0.311		R^2	0.332	
Adj. R^2	0.277		Adj. R^2	0.271		Adj. R^2	0.294	
D-W	2.021		D-W	2.015		D-W	2.017	
Sig.	<0.001		Sig	<0.001		Sig	<0.001	

The last step of the analytical procedure assessed the impact of individual subcomponents of ESG factors on public companies' profitability metrics (Table 8). Following the methodological assumptions, since environmental (*E*) and social (*S*) pillar scores turned to affect the ROA, ROE or ROC ratios statistically, we run additional regression models taking into account the breakdown of E and S variables into particular categories (as presented in Table 1). As our in-depth analysis is exemplary, we included *DACC_SH* as a variable estimating the extent of accrual-based earnings management in the tested models. Considering the environmental perspective (*E*), only the emission ranking variable (*E_E*), which measures the firm's effectiveness and commitment to reducing emissions to the environment (Siwiec and Karkowska, 2024), negatively affects ROA ratios in the tested sample. In the case of the other two categories included in the assessment of ESG performance from an environmental perspective, we did not detect significant correlations. In turn, our examination of social factors (*S*) that influence the profitability metrics of public companies yielded slightly different results. We noticed that only the *S_C* variable, describing the firm's commitment to business ethics, positively affected the values of ROE and ROC ratios. We did not capture statistical dependencies for the remaining categories constituting the social pillar ranking (S).

Table 8. The effect of individual categories constituting the environmental (E) and social (S) pillar rankings on profitability metrics of public companies. Note: **/* indicate significance at the 0.01/0.05 levels, respectively.

Dependent variables								
ROA			**ROE**			**ROC**		
Model specifications								
Variables	**B**	**(St. Error)**	**Variables**	**B**	**(St. Error)**	**Variables**	**B**	**(St. Error)**
Intercept	-0.043	0.036	Intercept	-0.132	0.085	Intercept	-0.062	0.046
E_RU	0.000	0.000	E	-0.001	0.001	E	-0.001	0.001
E_E	-0.001*	0.000	*S_W*	0.002	0.001	*S_W*	0.001	0.001
E_I	-0.000	0.000	*S_C*	0.002*	0.001	*S_C*	0.001*	0.000
S_W	0.001*	0.000	*S_HR*	0.000	0.001	*S_HR*	0.000	0.000
S_C	0.000	0.000	*S_PR*	0.000	0.001	*S_PR*	0.000	0.000
S_HR	0.000	0.000	G	-0.001	0.001	G	-0.001	0.001
S_PR	0.001	0.000	L	0.003*	0.001	L	0.002**	0.001
G	0.000	0.000	DACC_SH	0.641*	0.285	DACC_SH	0.492**	0.153
L	0.001*	0.001	TANG	-0.086	0.070	TANG	-0.052	0.038
DACC_SH	0.534**	0.118	GO	-0.662**	0.204	GO	-0.341**	0.110
TANG	-0.018	0.031	LEV	0.022**	0.001	LEV	0.004**	0.001
GO	-0.158	0.088	EVOL	-0.003	0.005	EVOL	-0.001	0.002
LEV	-0.001	0.001						
EVOL	0.000	0.002						
R	0.510		R	0.809		R	0.574	
R^2	0.260		R^2	0.655		R^2	0.330	
Adj. R^2	0.191		Adj. R^2	0.628		Adj. R^2	0.277	
D-W	2.156		D-W	2.000		D-W	2.054	
Sig.	<0.001		Sig	<0.001		Sig	<0.001	

DISCUSSION

The obtained research results allow for a negative verification of the first research hypothesis (H.1), stating that the environmental pillar score positively impacts the profitability metrics of public companies traded on the WSE. We found no clear evidence of a robust relationship between the *E* variable and ROE and ROC ratios. In the ROA ratio case, we significantly captured the impact of environmental performance on firms' profitability only after including in the regression model variables describing the extent of earnings management. However, the relationship above was negative, which confirmed earlier observations by Nollet et al. (2016) and Mikołajek-Gocejna (2024). We assume that the strive of companies to minimize the negative impact of their activities on the natural environment contributes to high operating costs. The positive

DOI: 10.55643/fcaptp.5.58.2024.4540

effect of showing respect for the natural environment will bring benefits in the long term. Similarly, we rejected the second research hypothesis (H.2) that the governance pillar score (G) positively affects the financial performance of public companies. In none of the tested models did the category ranking the institutional framework and corporate governance mechanisms in the firm prove to have a statistical impact on the value of the ROA, ROE and ROC ratios. These findings contrast the research of Agnese et al. (2023).

On the other hand, we confirmed the third research hypothesis (H.3) that the social pillar score evaluated *via* Refinitiv methodology positively impacts the profitability of listed companies traded on the WSE. This observation applies especially to profitability assessment from the ROC and ROE ratios perspective and is consistent with the conclusions of Siwiec and Karkowska (2024) and Aydoğmuş et al. (2022). Our findings indicate that disclosures regarding a company's positive behaviour regarding respecting human rights, caring for local communities, and commitment to creating and delivering products in compliance with corporate ethics allow for stabilising business relationships and achieving higher financial performance.

The fourth hypothesis (H.4) that the magnitude of accounting-type earnings management impacts the profitability of firms' recognition by a high degree of non-financial disclosures is also true. Regardless of the model used to extract subcategories of accruals, we demonstrated that the *DACC* variable positively affects the ROA, ROE and ROC ratios in the tested sample. In other words, the higher the extent of earnings manipulation *via* accruals, the higher the profitability of public companies. It is an interesting finding because the earnings management phenomenon is a typical agency problem (Sun et al., 2024), and the policy of voluntary disclosures under ESG could constrain the asymmetry of information and managerial information advantages (Healy and Palepu, 2021). On the other hand, as Borralho et al. (2022) point out, managers concentrating on ESG activities are characterized by high ethics, so they should avoid engaging in earnings-altering practices. It is also worth emphasizing that by including the *DACC* variable we improved the goodness-of-fit of tested models to empirical data.

This research did not find statistical links between variables describing ESG performance and earnings management. However, our observations refer only to the results of empirical analyses based on Pearson linear correlation coefficients. Thus, this study leads to future studies on the relationships between corporate earnings manipulation and ESG in the Polish capital market. We also suggest further investigation into identifying relationships between public companies' profitability and individual categories of long-term returns pillar score (*L*).

This study should be viewed with consideration of several limitations. Firstly, the research sample is relatively small and consists of 33 companies. Although the Refinitiv Eikon database provides in-depth insight into firms' ESG performance (it captures over 600 firm-specific ESG measures, which are aggregated and assigned to one of three ESG pillar scores) (Mikołajek-Gocejna, 2024), it covers less than 10% of all companies listed on the Main Market of the WSE. This finding confirms that the practice of non-financial disclosures on the Polish capital market is only developing. Secondly, the specific nature of the Polish capital market, characterized by a high degree of concentration and operational independence of the WSE, may impact the obtained results. Thirdly, our investigation covers the years 2018-2022 and, therefore, takes into account the outbreak of the SARS-CoV-2 pandemic and its resulting economic turbulences. Comparable analyses conducted during economic prosperity years may provide different findings.

CONCLUSIONS

Investors' decisions that contribute to the effective allocation of capital in the market are taken based on information from various sources, of which the most reliable is the data reported in financial statements. However, in response to the global information needs of stakeholders, public companies are increasingly opting for non-financial disclosures that focus on their future-oriented prospects. Reporting initiatives behind the ESG acronym allow companies to increase their attractiveness to investors, enhance stakeholder trust, improve relations with regulators and stimulate constructive changes in managing environmental, social and governance issues.

This paper investigates the relationship between the ESG performance of public companies from the WSE and their profitability metrics. By utilizing ESG data provided by the Refinitive Eikon dataset we demonstrate contradictory results in assessing the impact of individual three pillars of ESG on the value of ROA, ROE and ROC ratios. Our study indicates primarily a positive relationship between the social dimension of ESG activities and the financial performance of companies as measured by ROE and ROC. The negative impact of the environmental pillar rank on the ROA ratio was captured only in selected regression analyses. The governance pillar score did not statistically affect any of the tested profitability metrics.

The inclusion of discretionary accruals in the set of variables is related to the fact that in light of the accounting scandals of recent years, interest in the phenomenon of earnings management has gained particular importance. Although earlier studies show that firms exhibiting higher ESG performance tend to yield earnings manipulation to a lesser degree, we gathered evidence that in public companies with a high range of non-financial disclosure, the magnitude of accrual-based earnings management is positively associated with their profitability metrics. This observation is also an interesting research area for further exploration, which can help harmonize financial statements with the social and managerial needs of the company.

This study cannot be generalized to all companies traded on the WSE. However, due to the clear research gap regarding the judgment of ESG activities and their influence on the financial performance of companies operating in the Polish capital market, conclusions derived from the research could interest investors, audit committees and sustainability reporting standards regulators.

ADDITIONAL INFORMATION

FUNDING

The Author received no funding for this research.

CONFLICT OF INTEREST

The Author declares that there is no conflict of interest.

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Компорек М.

ПОКАЗНИКИ ESG, УПРАВЛІННЯ ПРИБУТКАМИ ТА ФІНАНСОВІ ПОКАЗНИКИ: ДАНІ З ПОЛЬЩІ

Основна мета дослідження – вивчення взаємозв'язку між показниками діяльності ESG та показниками прибутковості 33 публічних компаній, що котируються на Варшавській фондовій біржі. Використовуючи методологію Refinitiv, ми відповідаємо на питання, чи позитивно впливають екологічні, соціальні та управлінські показники компанії на співвідношення ROA, ROE й ROC, чи існує негативний зв'язок. Другорядною метою дослідження є вивчення взаємозв'язку між прибутковістю та величиною управління сукупним прибутком у тестованій вибірці. Пом'якшувальний вплив маніпулювання прибутками на зв'язки між ефективністю ESG та показниками прибутковості компанії є прогалиною в дослідженнях, яка на сьогодні недостатньо вивчена. Це дослідження демонструє суперечливі результати: спостерігався позитивний зв'язок між соціальним виміром ESG-активностей та фінансовими показниками компаній щодо коефіцієнтів ROE й ROC. Негативний вплив рангу екологічної складової на коефіцієнт ROA був урахований лише в окремих регресійних аналізах. Оцінка компонента корпоративного управління статистично не вплинула на тестовані показники прибутковості. З іншого боку, ми зібрали докази того, що публічні компанії з високим спектром нефінансових розкриттів схильні змінювати прибуток через нарахування, а дискреційні нарахування статистично впливають на коефіцієнти ROA, ROE та ROC. Цей висновок контрастує з попередніми дослідженнями, які стверджували, що феномен управління прибутками є типовою проблемою агентства й що політика необов'язкового розкриття інформації відповідно до припущень ESG може обмежити асиметрію переваг інформації та управлінської інформації.

Ключові слова: ESG, прибутковість, фінансові показники, управління прибутками, Варшавська фондова біржа

JEL Класифікація: G32, M40

DOI: 10.55643/fcaptp.5.58.2024.4540