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Exploring the Relationship Between ESG Performance and Institutional Ownership: Evidence from Poland

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Abstract:

Purpose: *This study aims to investigate the relationship between Environmental, Social, and Governance (ESG) performance and institutional ownership among companies listed on the Warsaw Stock Exchange (WSE).*
Design/Methodology/Approach: *Utilizing a fixed-effects regression model, the analysis examines the impact of ESG scores on the number of institutional investors. The dataset comprises 37 publicly listed companies over the period from 2018 to 2021, with a focus on the individual contributions of environmental, social, and governance scores to institutional ownership dynamics.*
Findings: *The results reveal a nuanced relationship between ESG performance and institutional investor behaviour. Specifically, a higher Environmental Score is associated with a decrease in institutional investors, suggesting that investors may perceive enhanced environmental commitments as potential risks. Conversely, a stronger Governance Score correlates positively with institutional ownership, indicating that robust governance practices attract more institutional investors. The Social Score, however, does not show a statistically significant relationship with institutional ownership, suggesting that social factors may be less prioritized by institutional investors in this context.*
Practical Implications: *These findings imply that institutional investors in Poland may prioritize governance over environmental and social factors when making investment decisions. This could inform corporate strategies aimed at enhancing governance practices to attract institutional investment.*
Originality/Value: *This research contributes to the growing body of literature on ESG integration in investment strategies, particularly within the Polish market. It highlights the complexities of institutional investor preferences regarding ESG factors, providing insights that can guide both corporate governance and investment practices.*

Keywords: *ESG performance, institutional ownership, corporate governance, investment strategies.*

JEL Codes: *G15, G23, G32, M14.*
Paper Type: *Research Article.*

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1. Introduction

The integration of Environmental, Social, and Governance (ESG) factors into investment strategies has emerged as a pivotal area of research, reflecting a significant shift in how institutional investors approach their portfolios. This study aims to explore the relationship between ESG performance and institutional ownership, particularly in the context of Poland, where the adoption of sustainable investing practices is gaining momentum.

Understanding the dynamics of ESG integration is crucial, as it not only influences investment decisions but also contributes to the broader discourse on corporate responsibility and sustainability. The research question guiding this study is: How does ESG performance impact institutional investment decisions, and what implications does this have for corporate governance and financial outcomes? The importance of this research lies in its potential to inform both investors and policymakers about the value of ESG considerations in fostering long-term value creation.

By examining the interplay between ESG metrics and institutional ownership, this study seeks to contribute to the existing literature on sustainable finance and corporate governance. The methodology employed includes a comprehensive analysis of ESG data sourced from the Refinitiv database, alongside statistical tests to evaluate the relationships between variables.

The novelty of this research is underscored by its focus on the Polish market, which has been relatively underexplored in the context of ESG investing. The study delineates its scope by focusing on institutional investors and their investment behaviors, while also acknowledging the limitations posed by the availability of comprehensive ESG data.

The theoretical framework is grounded in the principles of sustainable finance, which advocate for the incorporation of ESG factors into investment decision-making processes. This research not only addresses the pressing questions surrounding ESG integration but also highlights the need for further exploration of the materiality of ESG issues in different market contexts.

2. Literature Review

The integration of Environmental, Social, and Governance (ESG) factors into investment strategies has garnered significant attention in recent years, driven by the increasing recognition of their impact on financial performance and corporate governance. A growing body of literature supports the notion that strong ESG performance correlates positively with improved financial outcomes.

For instance, Almeyda and Darmansya (2019) found that companies with robust ESG metrics tend to attract more institutional investment, particularly during periods of market volatility. This observation is crucial as it underscores the resilience of firms that prioritize sustainability, thereby enhancing their appeal to long-term investors (Cristea *et al.*, 2022).

Davis and Easton (2015) further elucidate this relationship by highlighting that firms demonstrating superior ESG practices are often rewarded with lower capital costs and higher stock valuations. Their research indicates that institutional investors are increasingly inclined to incorporate ESG factors into their investment decisions, recognizing that these metrics can serve as indicators of a company's long-term viability and ethical standing.

This trend is echoed by Park and Oh (2022), who argue that both institutional and individual investors should leverage ESG data to inform their investment strategies, thereby driving significant changes in corporate behavior.

Moreover, the literature reveals that the performance of sustainable investments is not uniform across different regions. Madison and Schiehll (2021) emphasize that while some markets present better opportunities for risk-adjusted returns through ESG strategies, the materiality of ESG issues can vary significantly.

This variability necessitates a nuanced understanding of how ESG factors influence investment decisions in diverse market contexts. The authors advocate for a focus on financially relevant ESG factors to optimize investment outcomes, suggesting that investors must navigate the complexities of regional dynamics when integrating ESG considerations into their strategies.

The role of private equity firms in the ESG landscape is also noteworthy. Research by Serafeim (2010; 2015) highlights that these firms recognize the financial benefits associated with ESG integration, particularly during economic downturns when Corporate Social Responsibility (CSR) initiatives are highly valued (Pagkalou *et al.*, 2024).

The findings suggest that private equity firms that actively engage with portfolio companies on ESG issues can foster better governance practices, ultimately leading to improved financial performance. This aligns with the observations made by Rau and Yu (2023), who contend that institutional investors' active involvement in ESG engagement contributes to enhanced oversight and accountability within organizations.

Furthermore, the methodological rigor of literature reviews in this domain has been emphasized by various authors. For instance, Aveyard and Bradbury-Jones (2019) discuss the proliferation of terms and approaches used in literature reviews,

advocating for systematic methodologies that minimize bias and enhance the quality of reviews.

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This perspective is supported by Gentles *et al.* (2016), who outline principles and strategies for conducting systematic reviews, emphasizing the importance of clarity and rigor in research design. Such methodological considerations are vital for ensuring that the findings of ESG-related research are robust and reliable. In summary, the literature on ESG integration in investment strategies highlights the growing importance of these factors in shaping institutional investment decisions.

The positive correlation between strong ESG performance and financial outcomes underscores the need for investors to prioritize sustainability in their portfolios. However, the complexities involved in integrating ESG factors necessitate a nuanced understanding of regional dynamics and the materiality of ESG issues. As the field continues to evolve, methodological rigor in literature reviews will play a crucial role in advancing knowledge and informing best practices in sustainable investing.

3. Research Methodology

This study employs a mixed-methods approach to explore the relationship between Environmental, Social, and Governance (ESG) performance and institutional ownership in Poland. The methodology is structured to provide a comprehensive analysis of the interplay between ESG metrics and investment behaviors of institutional investors, utilizing both quantitative and qualitative data sources.

The primary data for this research is sourced from the Refinitiv database, which provides extensive ESG ratings and financial performance metrics for publicly listed companies in Poland. The ESG scores encompass three individual pillars: environmental, social, and governance, allowing for a nuanced analysis of how each dimension influences institutional investment decisions (Martínez-Ferrero and Lozano, 2021).

The dataset includes information on institutional ownership percentages, the number of institutional investors and ESG ratings for a sample of firms listed on the Warsaw Stock Exchange (WSE) over the past five years.

The qualitative insights are gathered through a review of relevant literature that highlight the practices of institutional investors in Poland. This qualitative component aims to contextualize the findings within the broader landscape of ESG integration and investment behavior. The literature review draws on studies that examine the motivations and challenges faced by institutional investors when considering ESG factors in their investment decisions (Friede *et al.,* 2015; Eliwa *et al.,* 2021).

The quantitative analysis involves several statistical techniques to examine the relationship between ESG performance and institutional ownership.

The research introduces a fixed-effects model, reflecting differences in the mean values of the endogenous variable across the panel's cross-sectional entities. Given the variability in the average number of institutional investors among companies listed on the Warsaw Stock Exchange (WSE), the model accounts for this phenomenon by applying different constant values. A commonly used formula for the fixed-effects model (Maddala, 2006) is:

$$y_{it} = \alpha_i + \beta' X_{it} + \varepsilon_{it}$$

Where: β is the vector of parameters associated with the regressors, X_{it} represents the matrix of observations on the exogenous variables, and ϵ_{it} is the error term. The α_i represents the time-invariant but cross-sectionally varying fixed effects, specific to each entity in the panel (i.e., individual entities). The measurement of variables “X” and “y” in panel data is conducted over time "t" as well as across numerous cross-sectional entities.

This model is also referred to as the least squares with dummy variables (LSDV) model, as it can be estimated using ordinary least squares (OLS) methods. The model assumes that the individual effects are not random and can be estimated. Greene (2002) simplifies this model by omitting the time operator "t" when dealing with multiple cross-sectional units "N", focusing instead on a single explanatory variable X_i, as shown below:

$$\begin{bmatrix} y_1 \\ y_2 \\ \vdots \\ y_N \end{bmatrix} = \begin{bmatrix} X_1 \\ X_2 \\ \vdots \\ X_N \end{bmatrix} \beta + \begin{bmatrix} 1 & 0 & \cdots & 0 \\ 0 & 1 & \cdots & 0 \\ & & \vdots & \\ 0 & 0 & \cdots & 1 \end{bmatrix} \begin{bmatrix} \alpha_1 \\ \alpha_2 \\ \vdots \\ \alpha_N \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \vdots \\ \varepsilon_N \end{bmatrix} \quad \textit{where: } i = 1, 2, 3, \ldots, N$$

In this case, the parameter β is a scalar due to the presence of only one explanatory variable for all N cross-sectional entities. To generalize the formula to account for multiple explanatory variables, for instance, "k" variables, results in the creation of a matrix $X_{(Nxk)}$ and a corresponding parameter vector $\beta_{(kx1)}$.
When the matrix representation is expanded to include the time dimension "t", the number of rows in the matrix of explanatory variables "X" and the vector of dependent variables "y" increases. Moreover, the identity matrix associated with the vector of individual effects α no longer consist simple ones on the diagonal but instead unit vectors of dimension (T×1), where the time index "t" ranges from 1 to T.

4. Research Results and Discussion

This research aims to understand how ESG ratings affect ownership distribution, especially among institutional investors. The central hypothesis posits that companies with higher ESG scores are likely to attract more institutional investors, leading to a more dispersed ownership structure and reduced concentration of control by individual or family shareholders.

The empirical study utilizes panel data from 37 companies listed on the Warsaw Stock Exchange (WSE) over the period 2018 to 2021. The endogenous variable is defined as the number of institutional investors for each company (denoted as $INST\_NUM_{it}$), while the set of exogenous variables includes three widely recognized ESG scoring metrics: Environmental (E_Score_{it}), Social (S_Score_{it}), and Governance (G_Score_{it}).

The ESG data were sourced from the Refinitiv database (formerly Reuters), ensuring a high level of reliability in the data collection process. The specified variables were subjected to unit root testing using selected panel data stationarity tests (Levin *et al.*, 1992; Phillips and Moon, 1999; Strzała, 2009) to determine whether the variables exhibited unit roots, indicating non-stationarity. All estimations were performed using the R computing environment, with cross-validation conducted through the E-Views software package.

Based on the conducted tests (Table 1), it was concluded that the examined variables are stationary at a significance level close to 0.05. Most of the tests performed allowed for the rejection of the null hypothesis of the presence of a unit root, even at significantly lower significance levels.

Table 1. *Panel unit root tests for the examined variables*

Method	**INST_NUM$_{it}$**		**E_SCORE$_{it}$**		**S_SCORE$_{it}$**		**G_SCORE$_{it}$**	
Null: Unit root (assumes common unit root process)	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.
Levin, Lin & Chu t	-12,6572	0,000	-22,9952	0,000	-37,2461	0,000	-64,419	0,000
Null: Unit root (assumes individual unit root process)	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.
ADF - Fisher Chi-square	89,6989	0,0564	163,117	0,000	116,403	0,0004	118,134	0,0005
PP - Fisher Chi-square	131,524	0,000	203,927	0,000	130,018	0,000	135,374	0,000

Source: *Authors' calculations.*

The only exception was the Augmented Dickey-Fuller test (Dickey and Fuller, 1979) which for the variable INST_NUM$_{it}$ (i.e., the number of institutional investors) returned a value of 0.0564, which is close to the critical significance level of 0.05 commonly used in economic studies (Enders, 2003).

It is worth noting that other stationarity tests discussed in the literature (Gajda, 2017) raise no concerns regarding the confirmation of the desired property (i.e., stationarity).

Due to the nature of the data, which was collected for multiple entities over successive years from 2018 to 2024, a panel data model with fixed effects was estimated in this study. The individual effects obtained for specific companies were statistically significant, with the exceptions of "Getin" and "Mostostal".

Including these individual effects allowed for a better representation of the variability in the phenomenon under study, namely the number of institutional investors. The preliminary form of the model indicates that the impact of the social dimension score (S_Score$_{it}$) on the dependent variable (INST_NUM$_{it}$) is not statistically significant (Table 2).

Table 2. *Preliminary fixed effects panel model*

Residuals:				
Min	1Q	Median	3Q	Max
-60.154	-11.020	0.393	11.362	63.805
Coefficients:				
	Estimate	Std. Error	t value	Pr(>|t|)
E_Score	-0.6979	0.2324	-3.002	0.003328 **

S_Score	-0.1906	0.4461	-0.427	0.670076
G_Score	0.3960	0.2082	1.902	0.059827 .

***Source**: Authors' calculations*

In the presented model (Table 2), individual effects were not included due to the limited scope of the study. However, these effects were incorporated into the final model (Table 3), in which only the explanatory variables related to the environmental score (E_Score_{it}) and the governance score (G_Score_{it}) were retained.

***Table 3.** Final Fixed Effects Panel Model*

Residuals:				
Min	1Q	Median	3Q	Max
-60.210	-11.254	0.872	11.684	65.092
Coefficients:				
	Estimate	Std. Error	t value	Pr(>|t|)
E_Score	-0.7550	0.1894	-3.987	0.000121 ***
G_Score	0.3865	0.2062	1.874	0.063562 .
Factor_Alior	111.9346	15.6525	7.151	1.04e-10 ***
factor_Asseco	109.7681	15.5903	7.041	1.79e-10 ***
factor_Azoty	64.0818	18.0922	3.542	0.000586 ***
factor_B_Handlowy	80.3249	19.3734	4.146	6.71e-05 ***
factor_Bogdanka	39.3853	16.2229	2.428	0.016830 *
factor_Boryszew	42.9960	14.4148	2.983	0.003525 **
factor_Budimex	114.3825	19.3251	5.919	3.81e-08 ***
factor_CCC	169.9654	19.9647	8.513	1.02e-13 ***
factor_CDP	239.5662	13.3838	17.900	< 2e-16 ***
factor_Ciech	70.5423	12.7927	5.514	2.38e-07 ***
factor_Dino	219.5690	14.6873	14.950	< 2e-16 ***
factor_Enea	82.7800	16.0470	5.159	1.12e-06 ***
factor_Energa	67.9330	16.6626	4.077	8.70e-05 ***
factor_Eurocash	75.3388	20.4829	3.678	0.000367 ***
factor_Getin	-8.8923	14.4134	-0.617	0.538554
factor_Globe	38.7058	15.3506	2.521	0.013133 *
factor_GPW	58.1611	16.6508	3.493	0.000691 ***
factor_Grenevia	50.2412	16.6452	3.018	0.003165 **
factor_JSW	111.6615	17.3729	6.427	3.52e-09 ***
factor_KGHM	245.4150	17.7716	13.809	< 2e-16 ***
factor_Kruk	191.8933	18.7183	10.252	< 2e-16 ***

factor_LPP	217.7575	19.9300	10.926	< 2e-16 ***
factor_mBank	146.7361	23.6347	6.209	9.92e-09 ***
factor_Millennium	147.8417	18.3183	8.071	1.00e-12 ***
factor_Mostostal	19.5832	16.4829	1.188	0.237381
factor_Neuca	56.1276	16.3267	3.438	0.000831 ***
factor_Orange	171.7079	21.6382	7.935	2.00e-12 ***
factor_Orlen	256.6840	21.9169	11.712	< 2e-16 ***
factor_PGE	172.0734	17.2442	9.979	< 2e-16 ***
factor_PKO_BP	264.9895	17.3748	15.251	< 2e-16 ***
factor_PKO_SA	250.9749	18.6494	13.458	< 2e-16 ***
factor_PKP	56.5276	14.4046	3.924	0.000153 ***
factor_Polsat	193.8302	17.2318	11.248	< 2e-16 ***
factor_PZU	267.8440	23.1596	11.565	< 2e-16 ***
factor_Santander	191.0125	23.7765	8.034	1.21e-12 ***
factor_Stalprodukt	42.5558	14.5192	2.931	0.004117 **
factor_Tauron	77.9323	17.4634	4.463	1.98e-05 ***

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1				
Residual standard error: 22.97 on 109 degrees of freedom				
Multiple R-squared: 0.9798, Adjusted R-squared: 0.9726				
F-statistic: 135.6 on 39 and 109 DF, p-value: < 2.2e-16				

Source: *Authors' calculations.*

The analytical representation of the estimated fixed effects panel model is as follows:

$$\widehat{\text{Inst\_num}}_{it} = -0{,}755 * E\_Score_{it} + 0{,}3865 * G\_Score_{it} + c_i$$

where:

- INST_NUM_{it} represents the endogenous variable, which is the number of institutional investors for the i-th company in year t;
- E_Score_{it} denotes the environmental score for the i-th company in year t;
- G_Score_{it} refers to the governance score for the i-th company in year t;
- c_i is the individual fixed effect for the i-th company.

It is noteworthy that the model demonstrates a relatively high fit to the empirical data, with an explanatory power exceeding 90 percent (as shown in Table 3). The estimate of the parameter associated with the variable E_Score_{it} is (-0.755), and this estimate is significantly different from zero at a significance level of less than 0.01.

The other exogenous variable, G_Score_{it}, has a relatively larger estimation error, with an empirical significance level (probability) of approximately 0.06. This error corresponds to a positive parameter value of 0.3865.

Thus, a one-unit increase in the governance score (G_Score_{it}) is expected to lead to an average increase of 0,3865 institutional investors ($INST\_NUM_{it}$) for a given company, assuming all other factors remain constant (ceteris paribus). Conversely, the negative estimate of the parameter (-0.755) for the variable (E_Score_{it}) indicates a negative relationship between the environmental score and the number of institutional investors. Specifically, a one-unit increase in the environmental score (E_Score_{it}) is expected to result in an average decrease of 0,755 institutional investors ($INST\_NUM_{it}$), again under the assumption of ceteris paribus.

As previously mentioned, the social dimension score (S_Score_{it}) does not have a statistically significant effect on the number of institutional investors in this model. The inclusion of individual effects led to a notable reduction in degrees of freedom. However, with a sample size of 148 observations, estimating individual effects was deemed highly relevant to the study's main objective and did not negatively impact the results.

The statistical significance of incorporating individual effects for cross-sectional entities was tested using the Wald test, which allows for a comparison between the fixed effects model and the pooled regression model (Baltagi, 2008).

As shown in Table 4, the high F-test value of 34.315 along with a very low empirical significance level, with a p-value of less than $2.2e^{-16}$, confirms the need to incorporate individual effects into the model.

Table 4. *F-test comparing the fixed effects model with the pooled regression model*
F test for individual effects

data: Inst_Num ~ E_Score + G_Score
F = 34.315, df1 = 37, df2 = 109, p-value < 2.2e-16
alternative hypothesis: significant effects

Source*: Authors' calculations.*

The study also attempted to estimate a random effects model, which accounts for individual effects as a part of the residual variability. However, associating individual effects with the residuals induces autocorrelation, requiring the use of Generalized Least Squares (GLS) for estimation. Ultimately, the estimated random effects model did not satisfy the necessary statistical assumptions and was excluded from the final report for brevity. Nevertheless, a Hausman test was performed (Maddala, 2006), to determine whether a fixed effect or random effects model was more appropriate.

Table 5. *Hausman test comparing the fixed effects model with the random effects model*

Hausman Test
data: Inst_Num ~ E_Score + G_Score
chisq = 26.418, df = 2, p-value = 1.834e-06

Source*: Authors' calculations*

Based on the results shown in Table 5, the null hypothesis is rejected in favor of the alternative hypothesis in the Hausman test. This conclusion is supported by the high test statistic value of 26.418 and the low p-value of $1.834e^{-6}$.

This findings indicate that the individual effects are correlated with the regressors, meaning that only the fixed effects model provides an unbiased estimator. Therefore, the fixed effects model is deemed the appropriate specification for this analysis (Mundlak,1978).

5. Conclusions, Proposals, Recommendations

This research offers valuable insights into the dynamics between Environmental, Social, and Governance (ESG) factors and the behavior of institutional investors concerning companies listed on the Warsaw Stock Exchange (WSE). Utilizing a fixed-effects model with an adjusted R-squared value exceeding 90%, the analysis reveals several key findings:

1. Environmental Score (E_Scoreit): The analysis indicates a negative and statistically significant coefficient (-0.755) for the environmental score, suggesting that companies with higher environmental ratings tend to attract fewer institutional investors. Specifically, an increase of one unit in the environmental score correlates with an average reduction of 0.755 institutional investors, holding other factors constant. This outcome implies that institutional investors may perceive enhanced environmental commitments as potential risks or costs, possibly due to the capital investments or operational changes necessary to comply with environmental regulations, which could adversely affect financial performance.

2. Governance Score (G_Scoreit): In contrast, the governance score presents a positive coefficient (0.3865), indicating that stronger governance practices are linked to a greater number of institutional investors. Although the p-value (0.0636) is marginally above the conventional significance threshold of 0.05, it suggests a noteworthy relationship. A one-unit increase in the governance score is associated with an average increase of 0.3865 institutional investors, ceteris paribus. This finding highlights the significance that institutional investors place on governance frameworks, likely viewing robust governance as crucial for mitigating management-related risks and ensuring organizational stability.

3. Social Score (S_Scoreit): The social score, however, did not demonstrate a statistically significant relationship with the number of institutional investors in this analysis. This outcome suggests that, at least during the period studied, institutional investors may prioritize environmental and governance factors over social dimensions. This could indicate either a lesser emphasis on social aspects or a more intricate relationship that warrants further exploration through alternative analytical frameworks.

4. Individual Company Effects: The incorporation of individual company fixed effects markedly improved the model's explanatory capacity, capturing unique characteristics of firms that influence institutional investor behavior. Nevertheless, companies such as "Getin" and "Mostostal" did not exhibit significant individual effects, indicating that firm-specific attributes may play a lesser role in attracting institutional investor interest for these entities.

In conclusion, the findings indicate that institutional investors in the Polish market tend to favor companies with strong governance practices, while those with a pronounced focus on environmental initiatives may face reduced investor interest. This trend may reflect a short-term orientation among institutional investors, prioritizing immediate financial stability over long-term sustainability objectives.

Despite the robustness of the model, this study is not without limitations. The sample is confined to 37 companies over a relatively brief period from 2018 to 2021, which may limit the generalizability of the findings to other markets or time periods.

Additionally, the model does not account for potential endogeneity issues, such as reverse causality, where the presence of institutional investors could influence ESG scores rather than vice versa. Furthermore, while the fixed-effects model addresses unobserved heterogeneity, it assumes that individual effects remain constant over time, potentially overlooking dynamic changes in company performance or shifts in investor preferences.

Future research could enhance this analysis by incorporating a larger dataset that encompasses more companies and extends the time frame beyond 2021 to capture long-term trends. Employing dynamic panel data models, such as the Arellano-Bond estimator, could also help mitigate endogeneity concerns.

Further investigation into the interplay between ESG factors and other financial performance indicators, such as return on assets (ROA) or return on equity (ROE), could yield a more comprehensive understanding of the determinants of institutional investment.

Lastly, cross-country comparisons could provide insights into how ESG considerations shape institutional investor behavior across varying regulatory landscapes.

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