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The Influence of Environmental, Social, Governance (ESG) Disclosure on Investment Efficiency

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Abstract

Purpose – This study aims to determine the influence of Environmental, Social, and Governance (ESG) disclosure on investment efficiency in the emerging market of Indonesia.

Design/methodology/approach – The sample in this study consists of 39 non-financial companies listed on the Indonesia Stock Exchange with ESG scores from Refinitiv Eikon. This study utilizes unbalanced data with 178 firm-year observations and is analyzed using panel regression.

Findings – This study's findings diverge from previous research. Our results indicate a significant negative influence of ESG disclosure on investment efficiency. Consequently, increased ESG disclosure can be anticipated as a mechanism of greenwashing. Moreover, ESG disclosure has failed to address agency problems and information asymmetry, leading to a decline in investment efficiency.

Originality/value – To the best of the author's knowledge, this research is the first to examine and offer a unique perspective on the relationship between ESG disclosure and investment efficiency by focusing on Indonesia's context as an emerging market. The study not only fills a gap in the existing literature but also provides valuable insights into the specific challenges and opportunities faced by Indonesian companies in implementing ESG practices.

Research limitations/implications – Research on ESG disclosure remains limited in Indonesia, primarily because many companies have not yet disclosed their ESG practices, which are also voluntary disclosures. Consequently, the availability of data from companies disclosing ESG information is scarce. This study's findings could motivate companies to adopt more comprehensive and accurate ESG reporting practices aligned with international reporting standards. Furthermore, the findings of this research can contribute to the growing body of ESG (non-financial disclosure) literature, particularly those exploring the potential negative influence of ESG disclosure.

Keywords: ESG disclosure, investment efficiency, greenwashing, refinitiv eikon

Article Type: Research Paper.

Introduction

In recent decades, a growing global consciousness regarding sustainability has emerged. The escalating prevalence of environmental degradation, social inequities, and corporate governance failures has prompted a heightened focus on these issues (Ji et al., 2023). Concurrently, investors and stakeholders have exerted increasing pressure on corporations to enhance transparency and accountability in managing their environmental and social impacts (Aydoğmuş et al., 2022). In response to these evolving expectations, the environmental, social, and governance (ESG) concept has been developed as a structured approach to address these challenges (Li et al., 2023). The ESG concept is also part of the response to climate change and aligns with the Sustainable Development Goals (SDGs) and international reporting standards (Pwc, 2022).

Fundamentally, the ESG concept aligns closely with corporate social responsibility (CSR) (Tsang et al., 2023; Gillan et al., 2021). However, the 2008's financial crisis underscored the inadequacy of CSR alone in ensuring long-term corporate sustainability and resilience amid a rapidly evolving landscape. In China, companies that have demonstrated a positive commitment to ESG disclosure have experienced enhanced sustainable growth, characterized by reduced financing constraints and improved human capital (Wang et al., 2022). Consequently, the integration of ESG disclosure has fortified the measurement of corporate sustainability within the decision-making process (Li et al., 2023; Almeyda & Darmansyah, 2019; Hayat & Orsagh, 2015).

In Indonesia, sustainability reporting has been mandated by the Financial Services Authority Regulation No. 51/POJK.03/2017. This regulation has spurred Indonesian companies to increasingly adopt ESG disclosure practices, as evidenced by Harymawan et al. (2021) who found that Indonesian non-financial companies with high-quality ESG disclosures were less likely to experience financial distress. In line with these findings, Chen et al. (2023) and Marzuki et al. (2023) further emphasize that successful implementation of ESG practices is positively correlated with long-term financial performance. A growing body of evidence suggests that companies prioritizing environmental and social responsibilities exhibit superior financial performance (World Economic Forum, 2023).

The integration of ESG factors into investment practices can be traced back to 2006 with the publication of the United Nations Principles for Responsible Investment (UNPRI) (United Nations, 2006). The prominence of ESG in contemporary investment decision-making is further evidenced by the latest findings from 2022 PwC's Global Investor Survey, which reveal ESG as a paramount consideration for investors (Pwc, 2022). Empirical studies suggest that investors perceive ESG practices as investments (Aydoğmuş et al., 2022) with the potential to generate positive Net Present Value (NPV) (Ronen, 2024), thereby enhancing investment efficiency (Biddle et al., 2009). Nevertheless, it is crucial to emphasize that positive NPV is not the sole determinant of investment efficiency. Companies must also ensure that their investments avoid underinvestment or overinvestment. Investment efficiency is a critical determinant of return on capital (Biddle et al., 2009), driving a higher cost to equity compared to the costs incurred for the investment (Abbas et al., 2018). High investment efficiency is associated with lower agency problems, aligning management and investor interests, and reducing the risk of deviations from the desired investment level (Omran, 2009).

Biddle et al. (2009) posit that investment efficiency also is a critical determinant of gross domestic product (GDP). A low GDP rate is typically associated with a high Incremental Capital-Output Ratio (ICOR) (Suandi & Delis, 2020). In 2023, Indonesia's relatively high ICOR of 7.6 suggests a subdued GDP rate, averaging around 5% annually (CNN Indonesia, 2023). An optimal ICOR is generally

considered to be between 3 and 4 (Imelda, 2019). Despite Indonesia achieving the second-highest Foreign Direct Investment (FDI) in Southeast Asia in 2022 (UNCTAD, 2023), the sustainability of this foreign investment is contingent upon domestic investment efficiency. The high level of ICOR and the large amount of foreign investment in Indonesia make research related to investment efficiency important.

According to Ellili (2022), ESG disclosure as non-financial information can significantly enhance transparency, thereby mitigating information asymmetry and agency costs, ultimately leading to more efficient investment. However, ESG disclosure may be used as a "greenwashing mechanism" by managers to manipulate corporate reputation and create a false impression of strong ESG practices (Ness & Mirza, 1991). Such practices, which are often misleading, can harm stakeholders, including the environment and investors (Jensen & Meckling, 1976). This opportunistic behavior can lead to misallocation of corporate resources and investment inefficiencies. To address this issue, companies can implement ESG disclosure by adhering to one or more of the primary ESG reporting standards, such as the Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), International Financial Reporting Standards (IFRS), Carbon Disclosure Project (CDP), or Task Force on Climate-related Financial Disclosures (TCFD). Moreover, Zhang et al. (2021) argue that ESG disclosure is a form of managerial signaling, demonstrating a positive attitude towards investors and ethical concerns to enhance corporate credibility and reputation.

The empirical literature exploring the nexus between ESG disclosure and investment efficiency remains relatively scant. Studies by Ellili (2022) and Hammami & Zadeh (2020) in developed markets found a positive correlation. However, Aryonanto & Dewayanto (2022) did not find a significant relationship in Indonesia. Furthermore, Al-Hiyari et al. (2022) found a positive correlation in several emerging markets. This study is crucial given the prevalence of information asymmetry and agency problems in emerging markets (Zamir et al., 2022) like Indonesia.

This research examines the relationship between ESG disclosure and investment efficiency, aiming to fill a gap in the existing literature on non-financial disclosure and contribute to the accounting literature in several ways. Firstly, this study goes beyond previous research on CSR disclosure and investment efficiency (Liu & Tian, 2021; Zhong & Gao, 2017) by utilizing ESG disclosure, which encompasses environmental, social, and governance factors. Secondly, this study focuses on ESG disclosure as non-financial information, while previous studies have primarily examined financial reporting quality and other financial information about investment efficiency (Chen et al., 2011; Biddle et al., 2009). The ESG score used in this study is sourced from Refinitiv Eikon, which provides a comprehensive dataset covering over 90% of the global market capitalization and more than 630 ESG metrics. By examining ESG disclosure as a voluntary disclosure (Dhaliwal et al., 2011), this study will demonstrate its implementation in non-financial firms in Indonesia. This research is expected to assist policymakers and companies in understanding the importance of best practices in ESG disclosure to prevent greenwashing and ensure compliance with standards. To the best of the author's knowledge, this is the first study in Indonesia to focus on the relationship between ESG disclosure and investment efficiency, and it can serve as a reference for future research. Using panel data regression analysis, the results indicate that ESG disclosure hurts investment efficiency. By examining the impact of ESG disclosure on investment efficiency, this research aims to contribute empirical evidence to the ongoing debate on the role of ESG disclosure. A key question is whether ESG disclosure can effectively mitigate information asymmetry and agency issues, thereby enhancing investment efficiency.

Literature Review

Agency Theory

Jensen & Meckling (1976) propose that agency theory explains the principal-agent relationship, where shareholders, as principals, engage management as agents through a contractual arrangement. Managers, acting as agents, provide financial statement to shareholders to showcase the company's performance and prospects. However, not all company information is disclosed in these reports, creating an information asymmetry favoring managers (Hammami & Zadeh, 2020). Information asymmetry and agency problems can lead to moral hazard and adverse selection issues, resulting in inefficient investment decisions such as overinvestment or underinvestment (Lara et al., 2016; Fazzari et al., 1988; Myers & Majluf, 1984).

In this research, ESG disclosure as non-financial information plays an important role in reducing information asymmetry and agency problems, thus increasing investment efficiency. ESG disclosure can mitigate overinvestment (Cook et al., 2019; Samet & Jarboui, 2017) by enhancing managerial oversight and limiting opportunistic behavior (Al-Hiyari et al., 2022). Previous studies have shown that enhanced CSR disclosure significantly contributes to increased investment efficiency (Liu & Tian, 2021) by reducing information asymmetry (Krüger, 2015; Cho et al., 2012; Dhaliwal et al., 2011).

Investment Efficiency

Investment efficiency is a fundamental financial issue for companies and has a significant impact on future company growth (Li et al., 2023). Biddle et al. (2009) conceptualize investment efficiency as a firm's ability to undertake positive net present value (NPV) projects in a frictionless market, absent adverse selection or agency costs. Investment inefficiency is defined as a deviation (either underinvestment or overinvestment) from the predicted optimal investment level (Al-Hiyari et al., 2022). Underinvestment occurs when firms fail to undertake positive NPV projects, while overinvestment happens when firms invest in negative NPV projects.

Environmental, Social, and Governance (ESG) Disclosure

ESG, an acronym for Environmental, Social, and Governance, is a concept that emphasizes sustainability and contains non-financial information. Barman (2018) explains that the environmental pillar focuses on a company's efforts to minimize its environmental impact, while the social pillar pertains to its ability to manage relationships with stakeholders such as employees, suppliers, customers, and the local community. Governance refers to a company's policy for ensuring good corporate governance. Currently, the most widely adopted standard for measuring corporate sustainability and accountability is ESG disclosure (Howard-Grenville, 2021). Voluntary ESG disclosures have successfully incentivized numerous companies to disclose their ESG information. Moreover, companies that undertake ESG disclosures will receive ESG scores.

Hypothesis Development

Based on agency theory, this study hypothesizes that ESG disclosure has a positive impact on investment efficiency (Jensen & Meckling, 1976). Ellili (2022) further elaborates on two potential mechanisms through which ESG disclosure can mitigate information asymmetry and enhance investment efficiency: the crowding-out effect of resources (Biddle et al., 2009) and the information communication effect (Makosa et al., 2020). Supporting this, Liu & Tian (2021) find empirical evidence that CSR disclosure is associated with reduced agency problems and improved investment efficiency, particularly in instances of underinvestment.

Previous studies have consistently demonstrated a positive correlation between ESG disclosure and investment efficiency. For instance, Ellili (2022) found this relationship to be significant in the United Arab Emirates, while Hammami & Zadeh (2020) observed the same in Canada. Moreover, Al-Hiyari et al. (2022) extended these findings to seven emerging markets: Brazil, Chile, India, Malaysia, Mexico, South Africa, and Turkey. As the second largest recipient of FDI in Southeast Asia, Indonesia shares similarities with the UAE, ranked 19th globally in terms of FDI inflows in 2020 (Ellili ,2022) and seven emerging markets studied by Al-Hiyari et al. (2022) which collectively attracted a combined total of approximately US$156.8 billion in FDI in 2020. These findings underscore the importance of investigating investment efficiency in countries with high levels of FDI.

The findings of Liu & Tian (2021) and Zhong & Gao (2017) prove that CSR disclosure has a positive impact on investment efficiency and supports the agency theory. Companies that disclose CSR can reduce information asymmetry and agency problems, and reduce inefficient investment, especially in cases of underinvestment. Gillan et al. (2021) mentioned that CSR disclosure and ESG disclosure can be substituted because both types of non-financial disclosure contain information about the company's social and governance actions. CSR information only contains implicit information about governance problems that are not directly related to the environmental and social efforts of the company. Meanwhile, ESG disclosure explicitly covers various types of non-financial information, including environmental, social, and governance. Departing from this, this study will go further than previous studies that only examine the influence of CSR disclosure to also compare the influence of ESG disclosure on investment efficiency, because ESG disclosure covers various types of implicit and explicit non-financial information. We expect that companies with higher levels of ESG disclosure will exhibit lower levels of information asymmetry and higher investment efficiency. In light of the aforementioned argument, this study proposes the following research hypothesis:

H1: There is a positive relationship between ESG disclosure and investment efficiency.

Methods

Data

his study quantitatively examines the causal link between ESG disclosure and investment efficiency, hypothesizing that firms with higher levels of ESG disclosure will exhibit greater investment efficiency. The study population consisted of all non-financial companies listed on the Indonesia Stock Exchange (IDX) during the five years from 2018 to 2022. Employing purposive sampling, a sample of 39 non-financial companies was selected. Unbalanced panel data was utilized to enhance the dataset and obtain a larger sample size, resulting in 178 observations.

Variables

1. Investment Efficiency
   Investment efficiency is measured using a model developed by Biddle et al. (2009). To estimate deviations from expected investment, we employ a firm-specific investment model that regresses investment on sales growth as a proxy for growth opportunities. The residuals from this model serve as a firm-specific measure of investment efficiency. The model is specified as follows:

$$Investment_{i,t+1} = \beta 0 + \beta 1 * Sales\ Growth_{i,t} + \varepsilon_{i,t+1}$$

   $Investment_{t+1}$ is calculated as the total new capital expenditure on property, plant, and equipment (PPE) divided by the lagged total PPE. $Sales\ Growth_t$ represents the percentage change in sales from period $t-1$ to period t. Firms are categorized into three quartiles based on the distribution of residuals. Those with the most negative residuals are designated underinvestment, while those with the most positive residuals are classified as overinvestment. The middle quartile firm serves as the benchmark group.

2. ESG Disclosure
   ESG disclosure in this study was measured using ESG scores provided by Refinitiv Eikon, which comprises three pillars: environmental, social, and governance scores. In this study, we observe that companies often prioritize one or two of the ESG pillars over others (Amel-Zadeh & Serafeim, 2018), leading to an imbalance in their ESG performance. To address this issue, we employ Refinitiv ESG scores, which provide a balanced assessment by calculating the arithmetic mean of the three pillars (Iazzolino et al., 2023). This approach allows us to compare companies' overall ESG disclosure more accurately, regardless of their specific areas of focus. The weights of the three ESG score pillars are normalized to a percentage ranging from 0 to 100. By leveraging self-reported data, ESG scores provide a transparent and comparable means of assessing a company's relative disclosure in environmental, social, and governance matters (Melinda & Wardhani, 2020).
3. Control Variables
   Control variables are used to isolate the causal relationship between ESG disclosure and investment efficiency. This is necessary because investment efficiency may not solely be influenced by ESG disclosure, but also by other factors. The control variables used in this study follow those employed by Ellili (2022).

Table 1. The Control Variables

Variables	Notation	Measure
Financial resources	SLACK	Cash/fixed assets
Assets' tangibility	TANG	Fixed assets/total assets
Age	AGE	Age of the company
Company Performance	ROA	Net income/total assets

Source: Adopted from Ellili (2022).

The panel data regression equation used in this study is:

$$INVEFF_{i,t+1} = \alpha_{i,t} + \beta 1ESG_{i,t} + \beta 2SLACK_{i,t} + \beta 3TANG_{i,t} + \beta 4AGE_{i,t} + \beta 5ROA_{i,t} + \varepsilon_{i,t+1}$$

Results

Descriptive Statistics Analysis

As depicted in Table 2, the dataset comprises 178 observations. Descriptive statistics reveal that the distribution of the dependent variable, investment efficiency (INVEFF), was quite wide, spanning from -15.99503 to 26.31585. The average investment efficiency was negative at -0.148546, indicating a prevalence of underinvestment among non-financial firms in Indonesia. The mean ESG disclosure score for the sample firms was 49.3323, with a standard deviation of 18.79685, indicating a moderate level of ESG reporting practices within the sample.

Table 2. The Descriptive Statistics Results

	N	Min.	Max.	Median	Mean	Std. Dev.
INVEFF (Y)	178	-15.99503	26.31585	-2.420364	-0.148546	8.573703
ESG (X1)	178	10.11	87.72	47.21	49.3323	18.79685
SLACK (C1)	178	0.004803	3.199249	0.326885	0.549673	0.651952
TANG (C2)	178	0.007287	0.803381	0.330196	0.36911	0.213592
AGE (C3)	178	7	89	40	39.9382	16.46608
ROA (C4)	178	-0.185812	0.358018	0.062473	0.077964	0.07821

(Source: Data processed with Eviews 12 Year 2024)

Table 3. The Pearson Correlation Coefficients Between the Variables

Covariance Analysis: Ordinary
Sample: 2018-2022
Included observations: 178

Correlation	INVEFF	ESG	SLACK	TANG	AGE	ROA
INVEFF	1.000					
ESG	-0.1729	1.000				
SLACK	0.0909	0.2776	1.000			
TANG	0.0013	-0.1014	-0.6307	1.000		
AGE	-0.1597	0.3970	0.0446	-0.0538	1.000	
ROA	0.1076	0.2051	0.2153	-0.1299	0.1954	1.000

(Source: Data processed with Eviews 12 Year 2024)

A series of diagnostic tests, including Chow, Hausman, and Lagrange Multiplier tests, were conducted to select the most appropriate panel data regression model specification, ensuring the robustness of the subsequent analysis. Following the results of the diagnostic tests, the random effects model was chosen as the most suitable specification. This model was chosen because it allows for both individual-specific effects and time-invariant effects, making it suitable for our dataset.

Table 4. The Panel Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.673132	3.887245	1.202171	0.2309
ESG	-0.110168	0.049790	-2.212630	0.0282
SLACK	2.861804	1.315391	2.175629	0.0309
TANG	3.060951	4.957202	0.617476	0.5377
AGE	-0.064602	0.070140	-0.921043	0.3583
ROA	7.976550	8.986983	0.887567	0.3760
R-squared				0.067449
Adjusted R-squared				0.040340
F-statistic				2.488064
Prob(F-statistic)				0.033248

(Source: Data processed with Eviews 12 Year 2024)

Model Test

Coefficient of Determination Test (R^2)

A coefficient of determination test was conducted to quantify the proportion of variance in the dependent variable that can be explained by the independent variable(s), thus assessing the model's goodness of fit. The results indicated a high coefficient of determination, suggesting that the model provides a strong fit to the data. The model's explanatory power is limited, as evidenced by the adjusted R-squared value of merely 0.04, suggesting that only 4% of the variation in the dependent variable can be accounted for by the independent variables included in the analysis. The residual variance, constituting 96% (100% - 4%) of the total variance, is attributable to factors not accounted for by the variables included in this model.

Overall F-test

Based on Table 3, the calculated F-statistic is 2.488064 with a corresponding p-value (F-statistic) of 0.033248. When compared to the significance level of 0.05, the p-value (F-statistic) of 0.033248 is smaller than 0.05. Additionally, the calculated F-statistic of 2.488064 is more than the F-table 2.423887. The overall model is statistically significant, suggesting that the independent variables collectively success to explain a significant proportion of the variance in the dependent variable.

Partial T-test

A partial t-test was conducted to examine the individual significance of each independent variable in the model. The table above reveals a p-value of 0.0282 for ESG disclosure, which is statistically significant at the 5% level. The calculated t-statistic of (2.212630 > 1,973534) also exceeds the t-table. This indicates that ESG disclosure has a significant influence on investment efficiency. However, the negative coefficient of -0.110168 for ESG disclosure suggests an inverse relationship with investment efficiency. This finding contradicts the first hypothesis (H1) which stated that ESG disclosure would positively impact investment efficiency. Therefore, H1 is rejected.

Discussion

The panel data regression analysis presented in Table 4 provides evidence for the initial hypothesis (H1). The coefficient estimate for the ESG variable is 0.110168, which is statistically significant at the 5% level (p-value = 0.0282). Contrary to the H1, which postulated a positive association between ESG disclosure and investment efficiency, the empirical evidence from Indonesian non-financial firms demonstrates a significant inverse relationship. The findings of this study also diverge from those of Ellili (2022), Al-Hiyari et al. (2022) and Hammami & Zadeh (2020), which indicated a positive and significant impact of ESG disclosure on investment efficiency. This finding implies that as ESG disclosure increases, investment efficiency tends to decline. This negative influence of ESG disclosures can be attributed to several factors, posing significant challenges for future ESG disclosure.

Firstly, ESG disclosure still poses a challenge for companies in Indonesia, making them susceptible to greenwashing practices in disclosing actual ESG information (Al-Hiyari et al., 2022). Moreover, ESG disclosures that solely rely on self-reported ratings are particularly vulnerable to greenwashing (Edmans, 2023). Greenwashing is the selective disclosure of positive information about environmental, social, and governance performance while withholding negative information on these three pillars (Lyon & Maxwell, 2011). The voluntary nature of ESG disclosure (Dhaliwal et al., 2011) and the lack of oversight of ESG rating agencies (Tsang et al., 2023) can create a gap for managers to manipulate ESG information and company reputation (Xue et al., 2023; Ness & Mirza, 1991). Consequently, the disclosed ESG information often does not reflect the company's actual ESG performance and increases information asymmetry. Moreover, managers tend to adopt and disclose cost-effective ESG initiatives, while in fact, implementing ESG practices requires significant costs (Xue et al., 2023), but it is very easy to increase their ESG scores (Uyar et al., 2020) to meet stakeholder expectations regarding ESG performance (Parguel et al., 2011). This raises doubts about the credibility of companies with high ESG scores and hinders efforts to achieve sustainability goals. Despite numerous international reporting standards that can be used as guidelines for ESG disclosure, the phenomenon of greenwashing persists. This is due to the inconsistency or lack of uniform and mandatory international reporting standards (Uyar et al., 2020), allowing managers the flexibility to select the ESG metrics and data they disclose and report information that benefit them.

Secondly, ESG disclosure has not been able to overcome opportunistic managerial behavior related to free cash flow misuse, which can lead to resource misallocation and inefficient investment (Al-Hiyari et al., 2022). Pressure from investors and stakeholders to disclose ESG information encourages managers to make suboptimal investment decisions. Managers may use greenwashing mechanisms to increase stock returns (Yadav et al., 2024), obtain bonuses (Menla Ali et al., 2024), or avoid sanctions (Murphy & McGrath, 2013). Although these decisions may benefit the company in the short term, they can harm it in the long term. By providing the wrong incentives, greenwashing practices can encourage managers to focus more on appearance than on actual ESG performance. In addition, there are many cases where managers do not face significant consequences for engaging in greenwashing practices, so the government needs to establish strict regulations and sanctions to prevent companies from doing so (Sun & Zhang, 2019).

Our findings align with Lin et al. (2021), who demonstrated that CSR disclosure can lead to overinvestment (Masulis & Reza, 2015) in US firms. Additionally, Al-Hiyari et al. (2022) concluded that ESG performance can mitigate information asymmetry and agency problems, but this effect is more pronounced in addressing underinvestment rather than overinvestment issues. As shown in Table 4, financial resources have a significant positive influence on investment efficiency. In contrast, while assets' tangibility, leverage, size, and company performance exhibit a positive relationship with investment efficiency, these relationships are not statistically significant. Furthermore, age has a negative but insignificant relationship with investment efficiency. These findings suggest that an increase in financial resources empowers companies to make more efficient investment decisions.

Conclusion

This study investigated the influence of environmental, social, and governance (ESG) disclosure on investment efficiency in non-financial companies listed on the Indonesia Stock Exchange from 2018 to 2022. The findings reveal a significant negative correlation between ESG disclosure and investment efficiency. While higher ESG disclosure is expected to enhance investment efficiency, the results suggest that ESG information disclosed has not been effective in mitigating information asymmetry and agency problems, leading to decreased investment efficiency.

This research has implications for regulators in developing a comprehensive international ESG reporting framework to enhance transparency and accountability, and in strengthening oversight of ESG rating agencies to ensure that their assessments are independent and objective. Moreover, investors can use this research to monitor managers' ESG practices and ensure alignment with their ESG disclosures. For managers or companies, this research can motivate them to disclose ESG information by international reporting standards and actual ESG practices to avoid accusations of greenwashing. Finally, the negative correlation between ESG disclosure and investment efficiency is a novel finding in this research, providing a valuable reference for future studies.

The restricted scope of this study, as evidenced by the small sample and limited literature, necessitates additional research to validate the results and explore their broader implications. Future studies could address these limitations by increasing the sample size, utilizing alternative ESG score sources, and investigating other potential determinants of the correlation between ESG disclosure and investment efficiency.

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