# REPORTHINK.AI ROLE TO REDUCES SUSTAINABILITY REPORT INFORMATION ASYMMETRY

**SUCI NASEHATI SUNANINGSIH[1] , MUMPUNI WAHYUDIARTI SITORESMI[2] , SUAMANDA IKA NOVICHASARI[3] , WILDAN YUDHANTO[4]**

[1,2]Tidar University, Department of Accounting, Indonesia

[3]Tidar University, Department of Information Technology, Indonesia

[4]Tidar University, Department of Management, Indonesia

E-mail: [1]sucinasehati@untidar.ac.id, [2]mumpuni@untidar.ac.id, [3]manda@untidar.ac.id, [4]wildanyudhanto@untidar.ac.id,

## ABSTRACT

This research aims to examine the effect of Reporthink.AI on information asymmetry. This research uses 120 companies that are listed on the Indonesian Stock Exchange ESG Leader Index. Implementation of Reporthink.AI is measured by a dummy variable. Information asymmetry is measured by bid-ask spread. Data analysis uses fixed-effect regression. Based on data analysis, Reporthink.AI brings significant reduction in information asymmetry, validating its value as a technological advancement for enhanced transparency and credibility for company disclosures. This research has some contributions. First, this research contributes to the literature, especially contributes to extend the signalling theory in the context of AI and sustainability reporting. Second, this research gives new evidence of Reporthing.AI on information asymmetry, especially in the Indonesian Stock Exchange.

**Keywords:** *ESG Leader Index, Information Asymmetry, Machine Learning, Reporthink.AI, Sustainability Report*

## 1. INTRODUCTION

The study was conducted to address the persistent problem of information asymmetry in sustainability reporting, which undermined investor trust and distorted the allocation of capital in green finance. Although sustainability reports were designed to provide transparency on environmental, social, and governance (ESG) practices, their effectiveness remained limited by selective disclosure, lack of standardization, and greenwashing. These weaknesses created uncertainty for investors who sought to support genuinely sustainable firms and hindered the development of efficient sustainable capital markets.

Green investment was increasingly perceived as a commitment to sustainability and responsible investment rather than merely a profit-seeking activity [1]. Investors emphasized companies and projects engaged in environmental protection, such as renewable energy, clean technology, and carbon reduction. Green investors supported a transition toward a low-carbon economy as awareness of climate change and its financial risks grew. Extreme weather and regulatory changes affected traditional industries such as oil and gas, shifting investor sentiment toward sustainable investments. Government interventions, including carbon pricing and policies defining ESG (Environmental, Social, and Governance), also made investing in sustainable ventures easier and more attractive.

Performance considerations further drove this trend, as green investments increasingly proved competitive compared to many traditional sectors [2], [3]. The younger generation of investors, in particular, shaped the market by building demand for sustainable products such as green bonds and ESG funds. Nonetheless, obstacles remained, including greenwashing—where firms exaggerated their environmental achievements—and market volatility [4]. Despite these challenges, green investment continued to gain traction and reshaped finance so that profit was increasingly aligned with planet-friendly concerns.

A critical problem underlying these developments was information asymmetry between companies and investors. Companies often failed to fully disclose their environmental impacts, making it difficult to assess whether they could genuinely

be classified as green [5]. Although ESG reporting improved over time, the lack of standardized practices across industries and countries still produced inconsistencies and ambiguities. Some companies engaged in greenwashing, portraying themselves as environmentally responsible without meaningful changes in operations. This misled investors, reduced market efficiency, and channeled funds to undeserving entities. For green investors, overcoming information asymmetry required greater reliance on independent ESG ratings, third-party audits, and regulatory advances mandating clear and comparable sustainability reporting [6]. Addressing this issue was essential to building trust in the investor community and ensuring that capital allocation supported environmental progress.

Sustainability reports emerged as an important tool to reduce information asymmetry [8]. These reports were intended to provide insight into a company's ESG practices, including environmental impact management, resource use, carbon emissions, and social responsibility. However, the absence of standardization and regulatory enforcement limited their effectiveness. Companies often enjoyed wide discretion in deciding what to disclose and how to present it, encouraging selective reporting or overt greenwashing. As a result, sustainability-oriented investors were unable to distinguish reliably between genuinely responsible companies and those that merely projected an eco-friendly image [9]. The fragmentation of different reporting frameworks further complicated comparability across firms and industries. For sustainability reports to diminish information asymmetry effectively, they needed to be regulated, standardized, and verifiable so that investors could base decisions on accurate and comparable data [8], [10].

In response to these challenges, the Indonesia Stock Exchange (IDX) launched Reporthink.AI in 2024, an artificial intelligence (AI) system designed to assist listed companies in preparing sustainability reports. Reporthink.AI offered several advantages. Its automation features accelerated the reporting process, thereby improving the timeliness of disclosures [11], which enhanced their relevance for investor decision-making [12], [13]. The system was integrated with established frameworks such as the Global Reporting Initiative (GRI), the Sustainable Development Goals (SDGs), and Indonesian Financial Services Authority Circular Letter No. 16/SEOJK.04/2021, ensuring compliance with both international standards and national regulations [12], [13]. Furthermore, Reporthink.AI introduced a novel feature in which

the CEO delivered a voice message explaining the company's sustainability performance, thereby strengthening the firm's corporate identity [12]. The launch of Reporthink.AI constituted a unique intervention, as no prior study had empirically examined the impact of AI-enabled sustainability reporting tools on information asymmetry and investor responses in an emerging market.

The benefits of Reporthink.AI represented a positive signal for investors and were expected to elicit favorable market responses. Enhanced timeliness, improved relevance, stronger corporate identity, and regulatory compliance enabled investors to make better use of sustainability information, potentially leading to increases in stock prices [14]. In addition, Reporthink.AI helped mitigate greenwashing practices by generating standardized and verifiable disclosures, reducing the risk of misrepresentation [15], [16]. Prior studies demonstrated that high-quality information positively influenced investor reactions (Amsl et al. [17]; Wang and Li [18]; Berry et al. [19]). Likewise, AI adoption was shown to reduce information risk for capital market investors [20]–[26]. From the perspective of signalling theory, Reporthink.AI enhanced the signalling process by reducing information asymmetry and strengthening the credibility of sustainability reporting.

Based on these considerations, this research aimed to examine the effect of Reporthink.AI on information asymmetry in the Indonesian capital market. The study made several contributions. First, it extended the application of signalling theory to the intersection of AI and sustainability reporting. Second, it provided new empirical evidence on how Reporthink.AI influenced information asymmetry in the Indonesian Stock Exchange. In doing so, the study addressed a significant research gap, as previous literature had not explored the specific role of AI-powered sustainability reporting systems in emerging markets.

The originality of this study lay in its research questions and methodological approach. It asked whether the adoption of Reporthink.AI reduced information asymmetry and improved investor confidence in the Indonesian capital market—questions that had not been tested in the literature. Prior research established that high-quality and timely information influenced investor reactions positively [17]–[19], but no empirical evidence existed on how AI systems specifically shaped the signalling process in sustainability reporting. By grounding the analysis in signalling theory, the study extended theoretical applications into a new technological and institutional context.

In terms of methodology, the study was innovative in its intervention design. Unlike earlier research that relied solely on conventional ESG reporting measures or survey data, this study leveraged the introduction of Reporthink.AI as a natural experiment in the Indonesian Stock Exchange. This approach allowed the evaluation of market responses to AI-generated sustainability reports, providing real-time evidence on their impact on information asymmetry. By integrating AI adoption, regulatory compliance, and investor reactions into a unified framework, the study advanced both the literature on sustainable finance and the practice of capital market governance.

The results contributed novel insights by demonstrating that Reporthink.AI enhanced the timeliness, comparability, and credibility of sustainability reporting, thereby reducing information risk and strengthening investor trust. These findings not only filled a critical research gap but also established a new pathway for examining how digital innovation can transform the alignment between financial markets and sustainability objectives.

## 2. LITERATURE REVIEW

### 2.1 Signaling Theory

According Signaling theory functioned in situations where one party, most often the firm, sent credible signals to another party, typically investors, to reduce uncertainties and influence decision-making [27]. In the context of sustainability reporting, companies possessed more information about their environmental, social, and governance (ESG) practices than external stakeholders. This asymmetry posed challenges for investors who sought to assess the actual sustainable performance of firms.

An AI-powered reporting tool, namely Reporthink.AI, was one of the newest introductions by the Indonesia Stock Exchange to address information asymmetry in sustainability reporting. The integration of Reporthink.AI with international frameworks such as the Global Reporting Initiative (GRI) and national regulations such as OJK Circular No. 16/SEOJK.04/2021 was designed to enhance the credibility and comparability of sustainability disclosures. By improving the quality and consistency of information, Reporthink.AI enabled companies to send stronger and more credible signals to the market regarding their sustainability orientation [12], [13]. Furthermore, the inclusion of a personalized voice message from the CEO humanized the signal, strengthened corporate identity, and facilitated the building of

investor trust. In line with signaling theory, high-quality and timely disclosures enabled through Reporthink.AI were likely interpreted as positive by investors.

### 2.2 Reporthink.AI

Reporthink.AI is Reporthink.AI was an AI-based platform developed by PT IDX Solusi Teknologi Informasi (IDXSTI), a subsidiary of the Indonesia Stock Exchange (IDX). It was designed to assist listed companies in efficiently preparing sustainability reports in compliance with both local regulations and international standards. Launched in November 2024, Reporthink.AI aligned with the GRI standards and with OJK regulation SEOJK No. 16/SEOJK.04/2021 [12], [13]. By automating the reporting process, the platform allowed users to upload relevant data and receive a complete sustainability report within approximately 24 hours, provided that the data submitted was comprehensive [12], [13].

The platform incorporated several advanced features, including multilingual support, interactive reporting through the "Smart Document" format, and the innovative "Report by Voice" function, which allowed reports to be narrated using the CEO's voice [12], [13]. Data security was a key priority, with the system designed in accordance with global standards such as the General Data Protection Regulation (GDPR) and Indonesia's Personal Data Protection Law. In addition, certified Data Protection Officers (DPOs) oversaw data governance to ensure secure handling of sensitive information. By leveraging AI, Reporthink.AI enabled companies to fulfil their sustainability reporting obligations more effectively and focus on core business development without being burdened by complex administrative processes.

### 2.3 Information Asymmetry

Information Information asymmetry referred to a condition in which one party in a transaction possessed more or better information than another, creating an imbalance that often resulted in suboptimal decision-making, market inefficiencies, or exploitation [28]. In financial markets and corporate governance, this imbalance frequently existed between company insiders (e.g., managers or controlling shareholders) and external stakeholders (e.g., investors, regulators, or the public). When firms failed to disclose accurate, timely, and comprehensive information, investors were disadvantaged, making it difficult to assess the true value, risk, or sustainability of an investment [29]. As a consequence, assets could be

mispriced, capital costs could increase, and market confidence could diminish.

Information asymmetry was particularly critical in ESG reporting, where selective disclosures or qualitative judgments could obscure the real impact of a firm's operations. Thus, reducing information asymmetry through transparent reporting practices, third-party audits, and regulatory enforcement was essential to building trust, improving market efficiency, and

ensuring informed decision-making among stakeholders [30], [31]. Technological tools such as Reporthink.AI played a significant role in mitigating this asymmetry by standardizing disclosures, improving data accuracy, and enhancing accessibility of sustainability information for all stakeholders [32], [33].

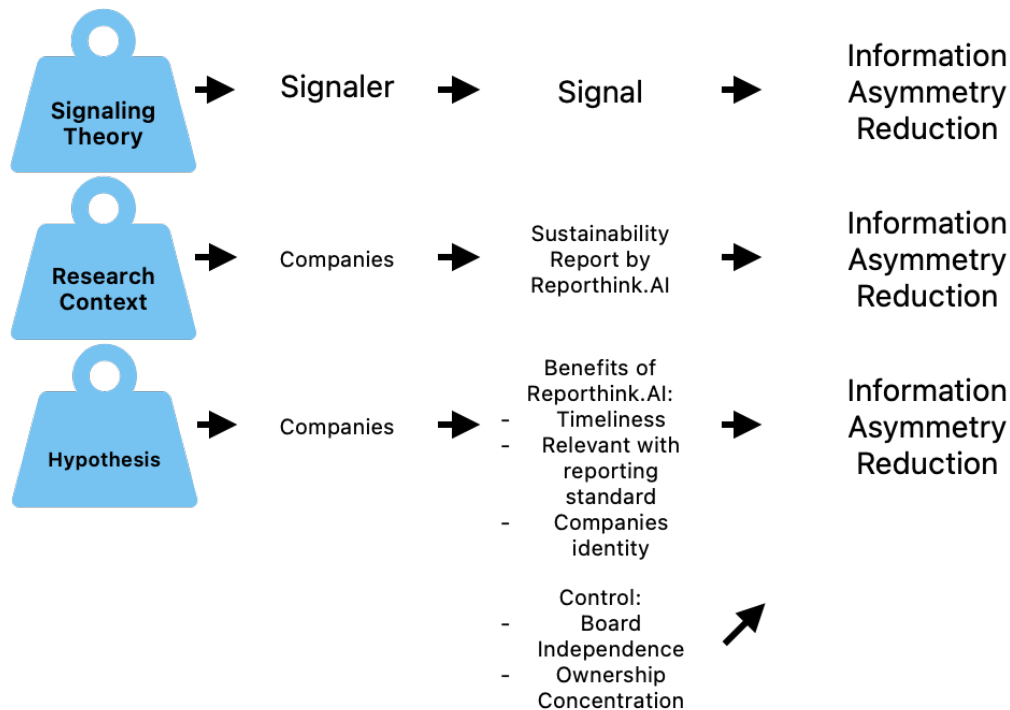**2.4 Research Framework Hypothesis Development**



*Figure 1: Research Framework*

The implementation of Reporthink.AI represented a significant contribution to reducing information asymmetry in corporate sustainability reporting, particularly when viewed through the lens of signaling theory. In markets where insiders held more information than external investors or stakeholders, this asymmetry distorted decision-making and undermined market efficiency. Signaling theory, as discussed by Connelly et al. [27], proposed that entities with superior but unobservable qualities could send credible signals to differentiate themselves from others.

For sustainability reporting, companies that invested in transparent and standardized disclosures effectively signaled their commitment to accountability, governance, and long-term performance. Reporthink.AI strengthened this mechanism by enabling firms to produce structured,

data-driven sustainability reports aligned with international standards such as GRI and in compliance with national regulations like SEOJK No. 16/SEOJK.04/2021. Unlike manually prepared reports, which were prone to managerial bias, greenwashing, or inconsistent disclosure, AI-generated reports reduced human error and increased perceived objectivity, thereby enhancing credibility in the eyes of external stakeholders.

In addition, Reporthink.AI enhanced accessibility through features such as "Smart Document" and "Report by Voice," which made reports easier to navigate and comprehend, even for non-technical stakeholders. Previous studies demonstrated the benefits of AI for investors in capital markets: Chopra and Sharma [23] highlighted its role in predicting market movements; Das [22] showed that AI supported

algorithmic trading; Jain and Vanzara [20] found that AI assisted in transforming historical data into profitable decisions; Lin and Marques [24] noted that AI facilitated investment strategy development; and Muhammad et al. [21] identified its potential to predict future stock price movements.

In summary, Reporthink.AI functioned not only as a technical tool for streamlining reporting but also as a strategic mechanism for reducing information asymmetry. By enabling credible signaling, promoting standardized and accessible disclosures, and aligning with both theoretical insights and empirical evidence on corporate transparency, the platform enhanced trust, reduced uncertainty, and facilitated more informed decision-making in capital markets.

Ha: Reporthink.AI reduced information asymmetry.

## 3. METHOD

This study adopted a quantitative research design with an explanatory approach, aimed at testing the effect of the implementation of Reporthink.AI on information asymmetry in companies listed on the Indonesia Stock Exchange (IDX). The research protocol was structured in four stages: population and sampling, data collection, variable operationalization, and data analysis.

### 3.1 Population and Sample

The population of this study consisted of companies listed on the Indonesia Stock Exchange (IDX), as Reporthink.AI was specifically designed for issuers on the IDX. The research sample was determined using a purposive sampling method, with criteria aligned with the research context. The criteria were as follows: (1) Companies included in the ESG Leader Index. The selection of the ESG Leader Index was based on two considerations. First, the study focused on the responses of green investors who integrated sustainability factors into their investment decisions. Investors interested in stocks listed in the ESG Leader Index were regarded as green investors who prioritized ESG performance. Second, the ESG Leader Index provided ESG risk scores, which served as indicators of sustainability quality and were used in this study as a proxy for information quality. (2) Companies listed during the period 2021–2024. The selection of this timeframe was based on the introduction of the ESG Leader Index and the implementation of SEOJK No. 16/SEOJK.04/2021, both of which began in 2021. The final sample consisted of 120 firm-year observations, as summarized in Table 1.

*Table 1: Sample.*

| Year | Total Companies Listed on the ESG Leader Index |
|---|---|
| 2021 | 30 |
| 2022 | 30 |
| 2023 | 30 |
| 2024 | 30 |
| Net Sample | 120 |

### 3.2 Data Collection Method

The study employed both primary and secondary data. Primary data were obtained directly from the IDX through interviews conducted during official field visits. These data included information regarding the benefits, implementation processes, types of information disclosed, relevant industries, and the adoption of Reporthink.AI among listed companies.

Secondary data were collected from third-party sources using documentation methods. These included stock price data, ESG risk scores, and ESG disclosure data. Publicly available sources such as www.idx.co.id and corporate websites were utilized, as well as subscription-based platforms such as www.ticmi.co.id and www.esgi.ai.

### 3.3 Variables

The study employed independent, dependent, and control variables. The independent variable was the implementation of Reporthink.AI, measured using a dummy variable, where a value of 1 was assigned to the implementation period (2024), and a value of 0 was assigned to the pre-implementation period (2021–2023).

The dependent variable was information asymmetry, which represented the level of risk borne by investors when making decisions based on available information. Information asymmetry was measured using the bid-ask spread, defined as the difference between the lowest ask price and the highest bid price at the time of sustainability report publication. It was calculated as in equation 1 [34].

$$Bid - Ask\ Spread = \frac{(the\ lowest\ ask\ price - the\ highest\ bid\ price)}{(the\ lowest\ ask\ price + the\ highest\ bid\ price)/2} \quad (1)$$

The study also incorporated control variables to account for changes in information asymmetry influenced by other factors. Control variables included board independence and ownership concentration. Independent board members, who were not part of company management, provided objective perspectives and acted in the interests of shareholders [35]. Their impartial oversight contributed to more accurate and transparent disclosures, reducing hidden agendas and manipulation [36]. Board independence was measured as the proportion of independent commissioners to the total number of commissioners [37].

When ownership was concentrated among a small number of large shareholders, these investors typically gained greater access to internal information and had stronger incentives to monitor management [38], thereby reducing information asymmetry between insiders and major shareholders [39]. Ownership concentration was measured as the proportion of shares held by the largest single shareholder [40].

### 3.4 Data Analysis

The data analysis applied regression testing to examine the effect of Reporthink.AI implementation on information asymmetry. The analysis was preceded by classical assumption testing to ensure robustness.

A fixed-effect panel regression model was employed at the company level, based on the rationale that each firm possessed unique strategies and business activities, which influenced the contextual relevance of sustainability disclosures. The regression model was formulated in equations 2.

$$ASYM = a + b1AI + b2IND + b3CON + \sum company + e \quad (2)$$

ASYM was information asymmetry. AI was Reporthink.AI. INDP was board independence. CON is ownership concentration. Σcompany was company fixed-effect. Hypothesis was accepted if coefficient of b1 was negative and significant.

## 4. RESULTS AND DISCUSSION

### 4.1 Descriptive Statistics

*Table 2: Descriptive Statistics.*

| Variable | Average | | | t-Statistics |
|---|---|---|---|---|
| | All N=120 | Before Reporthink.AI N=90 | After Reporthink.AI N=30 | |
| Information Asymmetry | 0.006 | 0.007 | 0.005 | 2.175** |
| Board Independence | 0.477 | 0.477 | 0.479 | |
| Ownership Concentration | 0.572 | 0.569 | 0.581 | |
| **Significant in 0.05 | | | | |

Table 2 presents descriptive statistics for key governance and information variables before and after the adoption of Reporthink.AI. The table compares average values across all observations (N=120), before implementation (N=90), and after implementation (N=30), along with t-statistics to assess the significance of any changes.

The first variable, Information Asymmetry, shows a notable decrease following the adoption of Reporthink.AI. Before implementation, the average level of information asymmetry was 0.007, which dropped to 0.005 after implementation. The t-statistic for this change is 2.175, which is statistically significant at the 0.05 level. This suggests that the use of Reporthink.AI is associated with a meaningful reduction in information asymmetry, potentially indicating improved transparency and communication between management and stakeholders.

Board Independence shows minimal change between the two periods. The average value remained virtually unchanged, from 0.477 before implementation to 0.479 after. Similarly, Ownership Concentration experienced only a slight

increase, rising from 0.569 before Reporthink.AI to 0.581 after.

**4.2 Classical Assumptions**

*Table 3: Classical Assumptions.*

| Test | Result |
|---|---|
| Kolmogorov-Smirnov | Significance > 0.05 |
| VIF | VIF < 10 |
| Glejser | Significance > 0.05 |
| Run | Significance > 0.05 |

Table 3 summarizes the diagnostic tests conducted to ensure that the classical assumptions of linear regression are met, thus validating the reliability and robustness of the regression results. These assumptions include normality of residuals, absence of multicollinearity, homoscedasticity, and the randomness of residuals. The outcomes of the respective tests, Kolmogorov-Smirnov, Variance Inflation Factor (VIF), Glejser, and Run Test, are all within acceptable thresholds, indicating no violation of these assumptions.

Firstly, the Kolmogorov-Smirnov test is used to assess whether the residuals of the regression model follow a normal distribution. The reported result shows that the significance level is greater than 0.05, indicating that the residuals do not deviate significantly from normality. This supports the assumption of normality, which is important for conducting valid hypothesis testing in regression.

Secondly, the Variance Inflation Factor (VIF) values for all independent variables are reported to be less than 10, which suggests that multicollinearity is not a concern in the model. VIF values above 10 would indicate a high correlation between independent variables, which can distort coefficient estimates and reduce the interpretability of the model. So, the VIF result confirms that the independent variables are not excessively correlated.

Thirdly, the Glejser test, which examines the presence of heteroscedasticity (non-constant variance of residuals), also shows a significance level greater than 0.05. This result indicates homoscedasticity, meaning that the variance of the residuals is consistent across observations. Homoscedasticity is critical for ensuring that standard errors are unbiased and that the inference drawn from the regression is reliable.

Lastly, the Run Test is used to evaluate the randomness of the residuals. A significance value greater than 0.05 implies that the residuals are randomly distributed, suggesting no autocorrelation or systematic pattern. This supports the assumption that the residuals are independently distributed, another key condition for unbiased and efficient regression estimates. This adds credibility to the results and interpretations derived from the regression analysis, as it indicates that the estimates are unbiased, consistent, and efficient.

**4.3 Regression Analysis**

*Table 4: Regression Analysis.*

| Variable | Coefficient | t-Statistics |
|---|---|---|
| Constant | 0.009 | |
| Reporthink.AI | -0.002 | -2.321** |
| Board Independence | -0.003 | -1.277 |
| Ownership Concentration | 0.004 | 2.339** |
| F-Statistics | 4.449* | |
| Adjusted R-Squared | 0.080 | |
| *Significant in 0.01, **Significant in 0.05 | | |

Table 4 presents the results of a multiple regression analysis examining the effect of Reporthink.AI on information asymmetry. The dependent variable in this model is information asymmetry, and the key independent variables include the implementation of Reporthink.AI. The regression output provides coefficient estimates, t-statistics for hypothesis testing, the F-statistic for overall model significance, and the adjusted R-squared value indicating model fit.

The overall significance of the regression model is indicated by the F-statistic of 4.449, which is significant at the 0.01 level, suggesting that the model is statistically meaningful and that at least one independent variable is significantly related to the dependent variable. Finally, the adjusted R-squared value of 0.080 indicates that the model

explains about 8% of the variation in information asymmetry. While this is a modest level of explanatory power, it is not uncommon in cross-sectional corporate governance studies where many factors influence the outcome.

The variable of main interest, Reporthink.AI, has a negative coefficient of -0.002 and a t-statistic of -2.321, which is statistically significant at the 0.05 level. This indicates that the adoption of Reporthink.AI is significantly associated with a reduction in information asymmetry. In practical terms, firms that implemented this AI-based reporting system experienced, on average, lower levels of asymmetric information, likely due to improvements in disclosure quality, transparency, or data accessibility.

## 4.4 Discussion

This research offers strong empirical support for the proposition that the implementation of Reporthink.AI significantly reduces information asymmetry in corporate sustainability reporting. This finding is particularly meaningful when viewed through the lens of signaling theory. In environments characterized by information imbalances, where insiders possess more information than external stakeholders, credible signaling becomes critical. Sustainability disclosures, when transparent and standardized, act as signals that convey a company's commitment to accountability, governance quality, and long-term strategic orientation.

Companies adopting this AI-based reporting tool are able to send stronger and more credible signals to the market. Unlike traditional reports that may suffer from subjective bias or inconsistent formats, Reporthink.AI produces structured, data-driven reports aligned with international standards like the Global Reporting Initiative (GRI) and complies with local regulations such as SEOJK No. 16/SEOJK.04/2021. This standardization reduces the room for greenwashing or selective disclosure and enhances the overall integrity and comparability of sustainability information.

From a signaling perspective, firms that voluntarily invest in Reporthink.AI are likely perceived as having higher-quality governance and transparency practices. The tool's advanced features, such as "Smart Document" navigation and "Report by Voice" accessibility, broaden the audience of users who can effectively interpret sustainability disclosures, including non-technical investors. This further strengthens the signal by

democratizing access to information and reducing interpretive barriers.

The results also align with a growing body of literature exploring the role of AI in enhancing capital market efficiency. Studies by Chopra and Sharma (2021), Das (2024), Jain and Vanzara (2023), and Lin and Marques (2024) highlight how AI technologies assist investors in predicting market trends, analysing historical data, and formulating strategies. Muhammad et al. (2024) further emphasize AI's capacity to forecast stock price movements, underscoring how improved information flows, such as those enabled by Reporthink.AI, can directly benefit market participants. So, by reducing asymmetry in sustainability-related disclosures, Reporthink.AI contributes to a more informed investment environment, reducing uncertainty and enabling better capital allocation.

Reporthink.AI is more than just a reporting utility, it is a strategic communication tool that facilitates stronger market signals, improves information quality, and supports more efficient, transparent, and accessible capital markets. Its contribution to reducing information asymmetry reinforces the broader potential of AI in enhancing corporate sustainability practices and investor confidence.

## 5. CONLUSION

This study investigates the impact of Reporthink.AI on information asymmetry in corporate sustainability reporting. The findings show that the application of Reporthink.AI brings a significant reduction in information asymmetry, validating its value as a technological advancement for enhanced transparency and credibility in company disclosures. From the signaling theory viewpoint, Reporthink.AI enables companies to signal their good governance, accountability, and long-term performance by creating streamlined and standardized sustainability reports. The automatization and increased accessibility functions of Reporthink.AI improve the integrity and coverage of such disclosures, generating a genuine signal to external parties and capital market agents.

Several themes emerge from this study that require deeper exploration. The first theme is technological innovation in sustainability reporting. The results confirm that Reporthink.AI significantly reduces information asymmetry, positioning it as a critical technological tool for improving transparency and credibility. However, adoption is treated as a binary factor, overlooking

variations in intensity and sophistication of use. This raises the need for further investigation into how the degree of AI integration—such as advanced analytics, natural language processing, or customizable reporting templates—affects the quality and effectiveness of disclosures.

The second theme is signaling through AI-driven reporting. Consistent with signaling theory, Reporthink.AI allows firms to send credible signals of governance quality and long-term performance to stakeholders. While the study confirms the signaling effect, an important question remains as to whether these signals retain their credibility over time. Future research should examine whether widespread adoption risks producing standardized or "boilerplate" signals that reduce differentiation among firms.

The third theme relates to contextual and institutional factors. The findings are shaped by the Indonesian market, where regulatory frameworks, governance norms, and investor expectations may differ from those in other jurisdictions. This limitation highlights the importance of cross-country comparative studies that explore how different institutional environments mediate the impact of AI-driven reporting on information asymmetry.

The fourth theme involves governance characteristics beyond those examined in this study. While this research focuses on certain governance variables, such as board independence, other factors—including firm size, industry affiliation, or market volatility—are likely to influence the effectiveness of AI-based reporting. Expanding the set of governance and firm-level moderators would provide a more comprehensive understanding of the dynamics at play.

The final theme concerns methodological advancement. This study employs a quantitative design with panel regression, but qualitative approaches such as interviews or surveys with report preparers, regulators, and users could enrich the analysis. Such methods would offer deeper insights into how Reporthink.AI influences internal reporting practices and how stakeholders perceive AI-generated sustainability reports.

The results of this research carry both practical and policy implications. For companies, the findings highlight the strategic advantage of investing in AI-powered reporting systems to strengthen credibility and transparency in sustainability disclosures, thereby reducing information asymmetry and building trust with stakeholders. For regulators and standard setters, the study underscores the need to promote and facilitate technologies that align with sustainability reporting guidelines and enhance disclosure effectiveness. Investors and analysts also benefit from standardized, accessible, and reliable data, which improve decision-making and mitigate risks linked to asymmetric information.

Despite its contributions, this study faces several limitations. The relatively small sample size—particularly in the post-implementation group (N=30)—may constrain the generalizability of the results. The research also considers only a limited set of governance variables, without accounting for other relevant influences such as firm size or market volatility. Additionally, Reporthink.AI adoption is treated as a binary variable, without measuring the intensity or quality of use. Finally, the study focuses on a single national and regulatory setting, restricting the transferability of findings to other contexts.

Future research can build on this study by expanding the sample size and including more industries and jurisdictions to enhance generalizability. Examining the longitudinal effects of Reporthink.AI adoption over several reporting cycles will help assess its long-term impact on transparency and stakeholder trust. Future studies may also evaluate how different levels of AI integration shape reporting outcomes, and compare the effectiveness of various AI tools for sustainability reporting. Incorporating qualitative insights from interviews or surveys with key stakeholders could also reveal nuanced perspectives on how AI influences reporting behaviors and perceptions.

Taken together, these themes suggest that while Reporthink.AI demonstrates strong potential in reducing information asymmetry and enhancing reporting transparency, further research is necessary to understand its long-term credibility, cross-market applicability, integration depth, and interaction with broader governance structures. Addressing these areas will not only advance academic understanding but also provide meaningful guidance for firms, regulators, and investors navigating the intersection of digital innovation and sustainable finance.

**REFERENCES:**

[1] J. Ye and E. Dela, "The Effect of Green Investment and Green Financing on Sustainable Business Performance of Foreign Chemical Industries Operating in Indonesia: The Mediating Role of Corporate Social Responsibility," *Sustainability*, vol. 15, no. 14, p. 11218, Jul. 2023, doi: 10.3390/su151411218.

[2] C. Fu, L. Lu, and M. Pirabi, "Advancing green finance: a review of sustainable development," *Digital Economy and Sustainable Development*, vol. 1, no. 1, p. 20, Oct. 2023, doi: 10.1007/s44265-023-00020-3.

[3] M. U. Rehman, N. Nautiyal, and X. V. Vo, "Is it just green? Asymmetry behavior of returns in green investments," *International Review of Economics & Finance*, vol. 100, p. 104088, Jun. 2025, doi: 10.1016/j.iref.2025.104088.

[4] S. Treepongkaruna, H. H. A. Yong, S. Thomsen, and K. Kyaw, "Greenwashing, carbon emission, and ESG," *Bus Strategy Environ*, vol. 33, no. 8, pp. 8526–8539, Dec. 2024, doi: 10.1002/bse.3929.

[5] S. Zhao, M. Wang, Q. Zhu, Q. Zhou, and R. Mao, "Effects of information asymmetry on green advertising for remanufacturing within a closed-loop supply chain," *Transp Res E Logist Transp Rev*, vol. 188, p. 103618, Aug. 2024, doi: 10.1016/j.tre.2024.103618.

[6] Y. Tan and Z. Zhu, "The effect of ESG rating events on corporate green innovation in China: The mediating role of financial constraints and managers' environmental awareness," *Technol Soc*, vol. 68, p. 101906, Feb. 2022, doi: 10.1016/j.techsoc.2022.101906.

[7] I. Itan, S. Sylvia, S. Septiany, and R. Chen, "The influence of environmental, social, and governance disclosure on market reaction: evidence from emerging markets," *Discover Sustainability*, vol. 6, no. 1, p. 347, Apr. 2025, doi: 10.1007/s43621-025-01085-0.

[8] A. R. Al Natour, R. Meqbel, S. Kayed, and H. Zaidan, "The Role of Sustainability Reporting in Reducing Information Asymmetry: The Case of Family- and Non-Family-Controlled Firms," *Sustainability*, vol. 14, no. 11, p. 6644, May 2022, doi: 10.3390/su14116644.

[9] L. Wu, X. Yi, K. Hu, O. Lyulyov, and T. Pimonenko, "The effect of ESG performance on corporate green innovation," *Business Process Management Journal*, vol. 31, no. 8, pp. 24–48, Jun. 2024, doi: 10.1108/BPMJ-04-2023-0237.

[10] M. Kartini, S. Sarumpaet, and D. Sukmasari, "The Effect of Sustainability Assurance on Asymmetry Information : Evidence Indonesia," *International Journal of Research Publication and Reviews*, vol. 5, no. 3, pp. 4398–4407, Mar. 2024, doi: 10.55248/gengpi.5.0324.07115.

[11] M. G. Fadillah, "Genjot ESG, BEI Luncurkan Kecerdasan Buatan Reportthink.AI." Accessed: Mar. 20, 2025. [Online]. Available: https://investor.id/market/380598/genjot-esg-bei-luncurkan-kecerdasan-buatan-reportthinkai

[12] M. B. R. Attia, N. Lassoued, and H. Sassi, "Financial reporting timeliness and the value relevance of earnings: Evidence from banks in the MENA countries," *The International Trade Journal*, vol. 33, no. 3, pp. 277–301, May 2019, doi: 10.1080/08853908.2018.1459212.

[13] Y. Hema, "Entitas Usaha BEI, IDXSTI Luncurkan Layanan Reporthink.AI." Accessed: Mar. 20, 2025. [Online]. Available: https://investasi.kontan.co.id/news/entitas-usaha-bei-idxsti-luncurkan-layanan-reporthinkai

[14] I. Sulemana, L. Cheng, A. O. Agyemang, A. Osei, and T. M. Nagriwum, "Stakeholders and sustainability disclosure: Evidence from an emerging market," *Sustainable Futures*, vol. 9, p. 100445, Jun. 2025, doi: 10.1016/j.sftr.2025.100445.

[15] G. Liu, H. Qian, Y. Shi, Y. Zhang, and F. Wu, "Does ESG report greenwashing increase stock price crash risk?," *China Journal of Accounting Studies*, pp. 1–25, Jan. 2024, doi: 10.1080/21697213.2024.2303070.

[16] S. Yildirim, "Greenwashing: a rapid escape from sustainability or a slow transition?," *LBS Journal of Management & Research*, vol. 21, no. 1, pp. 53–63, Sep. 2023, doi: 10.1108/LBSJMR-11-2022-0077.

[17] S. Amsl, I. Watson, C. Teller, and S. Wood, "Presenting products on websites – the importance of information quality criteria for online shoppers," *International Journal of Retail & Distribution Management*, vol. 51, no. 9/10, pp. 1213–1238, Nov. 2023, doi: 10.1108/IJRDM-04-2023-0266.

[18] J. Wang and A. Li, "The Impact of Green Advertising Information Quality Perception on Consumers' Response: An Empirical Analysis," *Sustainability*, vol. 14, no. 20, p. 13248, Oct. 2022, doi: 10.3390/su142013248.

[19] C. Berry, J. Kees, and S. Burton, "Response satisficing and data quality in marketing:

measurement and effects of satisficing on objective knowledge, experimental results, and replicability of findings," *Journal of Marketing Theory and Practice*, vol. 33, no. 1, pp. 11–28, Jan. 2025, doi: 10.1080/10696679.2024.2385374.

[20] R. Jain and R. Vanzara, "Emerging Trends in AI-Based Stock Market Prediction: A Comprehensive and Systematic Review," in *The 4th International Electronic Conference on Applied Sciences*, Basel Switzerland: MDPI, Nov. 2023, p. 254. doi: 10.3390/ASEC2023-15965.

[21] D. Muhammad, I. Ahmed, K. Naveed, and M. Bendechache, "An explainable deep learning approach for stock market trend prediction," *Heliyon*, vol. 10, no. 21, p. e40095, Nov. 2024, doi: 10.1016/j.heliyon.2024.e40095.

[22] S. K. Das, "The Role of AI in Financial Markets: Impacts on Trading, Portfolio Management, and Price Prediction," *Journal of Electrical Systems*, vol. 20, no. 6s, pp. 1000–1006, Apr. 2024, doi: 10.52783/jes.2804.

[23] R. Chopra and G. D. Sharma, "Application of Artificial Intelligence in Stock Market Forecasting: A Critique, Review, and Research Agenda," *Journal of Risk and Financial Management*, vol. 14, no. 11, p. 526, Nov. 2021, doi: 10.3390/jrfm14110526.

[24] C. Y. Lin and J. A. L. Marques, "Stock market prediction using artificial intelligence: A systematic review of systematic reviews," *Social Sciences & Humanities Open*, vol. 9, p. 100864, 2024, doi: 10.1016/j.ssaho.2024.100864.

[25] S. Bahoo, M. Cucculelli, X. Goga, and J. Mondolo, "Artificial intelligence in Finance: a comprehensive review through bibliometric and content analysis," *SN Business & Economics*, vol. 4, no. 2, p. 23, Jan. 2024, doi: 10.1007/s43546-023-00618-x.

[26] P. Weber, K. V. Carl, and O. Hinz, "Applications of Explainable Artificial Intelligence in Finance—a systematic review of Finance, Information Systems, and Computer Science literature," *Management Review Quarterly*, vol. 74, no. 2, pp. 867–907, Jun. 2024, doi: 10.1007/s11301-023-00320-0.

[27] B. L. Connelly, S. T. Certo, C. R. Reutzel, M. R. DesJardine, and Y. S. Zhou, "Signaling Theory: State of the Theory and Its Future," *J Manage*, vol. 51, no. 1, pp. 24–61, Jan. 2025, doi: 10.1177/01492063241268459.

[28] B.-A. Piuaru, B. Tescaşiu, G. Epuran, M. H. Mosora, and I. S. Ivasciuc, "Information Asymmetry in the European Funds Market: Impact on Resource Allocation and Sustainable Development," *Sustainability*, vol. 16, no. 24, p. 11101, Dec. 2024, doi: 10.3390/su162411101.

[29] M. Yoro, "Impact of Financial Reporting Transparency on Investor Decision-Making," *American Journal of Accounting*, vol. 6, no. 1, pp. 25–36, Feb. 2024, doi: 10.47672/ajacc.1785.

[30] H. Biehl, C. Bleibtreu, and U. Stefani, "The real effects of financial reporting: Evidence and suggestions for future research," *Journal of International Accounting, Auditing and Taxation*, vol. 54, p. 100594, Mar. 2024, doi: 10.1016/j.intaccaudtax.2023.100594.

[31] J. Rajabalizadeh and H. Schadewitz, "Audit report readability and information efficiency: evidence from the Tehran Stock Exchange," *Journal of Accounting in Emerging Economies*, vol. 15, no. 2, pp. 491–516, Mar. 2025, doi: 10.1108/JAEE-08-2024-0344.

[32] Z. Sun, S. Che, and J. Wang, "Deconstruct artificial intelligence's productivity impact: A new technological insight," *Technol Soc*, vol. 79, p. 102752, Dec. 2024, doi: 10.1016/j.techsoc.2024.102752.

[33] O. Vyshnevskyi, "AI as a Mitigator of Information Asymmetry within Platform Strategiarchy Logic," *Economic Herald of the Donbas*, vol. 4, no. 78, pp. 5–11, 2024, doi: 10.12958/1817-3772-2024-4(78)-5-11.

[34] B. Chen, W. Chen, and X. Yang, "Does Information Asymmetry Affect Firm Disclosure? Evidence from Mergers and Acquisitions of Financial Institutions," *Journal of Risk and Financial Management*, vol. 18, no. 2, p. 64, Jan. 2025, doi: 10.3390/jrfm18020064.

[35] A. Arora, "Do independent directors enhance better corporate governance in companies in India?," *Public Administration and Policy*, vol. 27, no. 2, pp. 154–166, Sep. 2024, doi: 10.1108/PAP-05-2023-0057.

[36] E. F. Attia, T. H. Ismail, and M. Mehafdi, "Impact of board of directors attributes on real-based earnings management: further evidence from Egypt," *Future Business Journal*, vol. 8, no. 1, p. 56, Dec. 2022, doi: 10.1186/s43093-022-00169-x.

[37] K. R. Ariani, R. Wijayanti, Mujiyati, F. A. Prasetyo, and M. C. M. D. los Santos, "Board

of Commissioners' Relationship and Climate Change Disclosure: Evidence from Mining Companies," *Riset Akuntansi dan Keuangan Indonesia*, vol. 8, no. 2, pp. 218–227, Sep. 2023, doi: 10.23917/reaksi.v8i2.3047.

[38] H. Al Lawati and Z. Sanad, "Ownership Concentration and Audit Actions," *Adm Sci*, vol. 13, no. 9, p. 206, Sep. 2023, doi: 10.3390/admsci13090206.

[39] P. C. Bishwas and M. S. Hossain, "Does ownership concentration have an impact on financial performance of firms?," *Future Business Journal*, vol. 11, no. 1, p. 86, Apr. 2025, doi: 10.1186/s43093-025-00491-0.

[40] T. R. Wulandari and D. Setiawan, "Ownership concentration, foreign ownership and tunneling in Indonesia," *Rajagiri Management Journal*, vol. 17, no. 1, pp. 21–36, Jan. 2023, doi: 10.1108/RAMJ-12-2020-0068.