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Sustainability Disclosure and Information Asymmetry of Listed Industrial Companies in Nigeria

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Abstract: This study delves into the nexus between sustainability disclosure practices and the level of information asymmetry within Nigerian industrial companies listed on the Nigerian Exchange Group (NGX). A robust analysis was conducted over a decade, utilizing a sample size of 13 representative industrial firms. The research findings unequivocally demonstrate that environmental, social, and governance (ESG) disclosure practices play a pivotal role in reducing information asymmetry within this critical sector of Nigeria's economy. The study revealed that ESG disclosure practices have a significant and positive impact on mitigating information asymmetry. Environmental disclosure provides stakeholders with vital insights into a company's ecological footprint, risk exposure, and commitment to sustainable practices. Social disclosure highlights ethical initiatives and community engagement, fostering investor confidence and reducing risk perception. Governance disclosure bolsters transparency and accountability, allowing investors to make informed decisions and minimizing corporate governance-related risks. This research underscores the strategic importance of ESG disclosure for Nigerian industrial companies, highlighting its potential to enhance investor trust, reduce risk premiums, and foster long-term sustainability. These findings carry profound implications for corporate practice, regulatory policy, and investor behavior, advocating for continued emphasis on sustainability disclosure practices to create a more transparent and responsible investment environment within the Nigerian industrial sector.

Keywords: Environmental Disclosure, Governance Disclosure, Social Disclosure, Sustainability Disclosure and Information Asymmetry

1. Introduction

In an era marked by heightened environmental awareness, growing social responsibility, and increasing demand for transparency, sustainability has become a paramount concern for industrial companies worldwide. In Nigeria, where the industrial sector plays a crucial role in the nation's economic development, the need for sustainability practices is especially pronounced [4]. The pressure to balance profit generation with environmental and social responsibilities is more pressing than ever. In this context, the concept of sustainability disclosure has gained prominence as a means of communicating a company's commitment to responsible practices and its progress toward sustainability goals [3].

Sustainability disclosure entails the systematic reporting of an organization's environmental, social, and governance (ESG) performance to various stakeholders, including investors, regulators, customers, and the public. These reports provide crucial insights into a company's sustainability efforts, impact on the environment, and its social and ethical responsibilities [9]. For investors, sustainability disclosures can be valuable in assessing the long-term viability of a company, its resilience to environmental risks, and its alignment with responsible investment criteria [6].

However, the effectiveness of sustainability disclosure in reducing information asymmetry and promoting transparency remains a subject of significant debate. Information asymmetry occurs when different parties involved in financial markets possess unequal access to information [5]. This can lead to inefficiencies, distorted decision-making, and potential market distortions. In the context of sustainability, information asymmetry arises when companies fail to adequately disclose their ESG performance, leaving stakeholders, particularly investors, with incomplete or inaccurate information [1, 8].

This paper delves into the complex relationship between sustainability disclosure and information asymmetry among industrial companies listed on the Nigerian Exchange Group (NGX). It seeks to address fundamental questions: To what extent do industrial firms in Nigeria engage in sustainability disclosure, and what impact does this have on reducing information asymmetry? Moreover, it investigates the factors that influence the level of sustainability disclosure within this sector and the implications for stakeholders, from investors to regulatory bodies.

As we embark on this exploration, it is important to recognize the unique challenges and opportunities facing industrial companies in Nigeria. The industrial sector spans diverse industries, from manufacturing and construction to energy and infrastructure development. Each sector carries its own sustainability challenges and priorities, making the alignment of disclosure practice with local and global sustainability goals a multifaceted endeavor [26].

This article is structured to provide a comprehensive analysis of sustainability disclosure practices within the Nigerian industrial sector. It will examine the extent and quality of sustainability reporting, identify factors influencing disclosure, explore the impact on information asymmetry, and ultimately offer insights into the role of sustainability disclosure in enhancing transparency and responsible investment practices in Nigeria. The findings presented herein aim to inform corporate decision-makers, investors, policymakers, and the broader public about the critical nexus between sustainability disclosure and information symmetry within the Nigerian industrial landscape.

In the dynamic landscape of Nigerian financial markets, characterized by a burgeoning industrial sector and growing emphasis on sustainability, the relationship between sustainability disclosure and information asymmetry among listed companies has emerged as a critical and underexplored issue. Information asymmetry, characterized by unequal access to information among market participants, can lead to inefficiencies, mispricing of securities, and suboptimal investment decisions [11, 17, 22]. Conversely, sustainability disclosure represents a mechanism through which companies communicate their commitment to environmental, social, and governance (ESG) responsibilities, potentially reducing information asymmetry by providing stakeholders with a more complete picture of their ESG performance [8].

Despite the growing recognition of the importance of sustainability and the need for transparency in financial markets, the specific dynamics governing the interaction between sustainability disclosure and information asymmetry among Nigerian listed companies remain insufficiently understood.

Several critical questions and challenges emerge; to what extent do Nigerian listed companies in the industrial sector engage in sustainability disclosure, and what is the quality of the information provided in their sustainability reports? Is there significant variation in disclosure practices among companies in different industries and of varying sizes? How does sustainability disclosure influence information asymmetry in Nigerian financial markets? Does enhanced sustainability disclosure lead to reduced information asymmetry, facilitating more efficient pricing of securities and informed investment decisions? What are the determinants of sustainability disclosure among Nigerian industrial companies? How do factors such as regulatory compliance, corporate governance practices, and stakeholder pressures influence the extent and quality of sustainability reporting? What are the perspectives of key stakeholders, including investors, financial analysts, and corporate sustainability officers, regarding the relationship between sustainability disclosure and information asymmetry? How do these perspectives align or diverge, and what implications do they hold for corporate practices and investor behaviour? What are the policy implications of the nexus between sustainability disclosure and information asymmetry in Nigeria? How can regulatory bodies, stock exchanges, and policymakers foster greater transparency and responsible reporting practices among listed companies, ultimately reducing information asymmetry?

The intersection of sustainability disclosure and information asymmetry in Nigerian listed companies presents a complex and multifaceted challenge that warrants rigorous investigation [2]. Understanding the nature and dynamics of this relationship is vital for companies seeking to navigate the evolving landscape of responsible business practices, investors aiming to make informed decisions, and regulatory authorities striving to enhance the integrity and efficiency of financial markets [19]. This study endeavors to address these critical questions, shedding light on the nuanced relationship between sustainability disclosure and information asymmetry and its implications for the Nigerian industrial sector and financial markets as a whole.

2. Conceptual Clarification

Sustainability Disclosure

Sustainability disclosure has gained substantial attention on the global stage, driven by increasing recognition of the intertwined challenges posed by environmental degradation, social inequalities, and governance deficiencies [3]. The concept of sustainability encompasses the principles of economic viability, environmental responsibility, and social equity, commonly referred to as the triple bottom line [18]. In this context, sustainability disclosure entails the systematic reporting of an organization's efforts, initiatives, and performance in these three dimensions.

The adoption of sustainability disclosure has proliferated worldwide, primarily due to several influential factors. First, mounting evidence suggests a positive association between sustainability performance and financial outcomes [5, 9, 23]. Second, a growing emphasis on responsible investing has prompted investors to seek comprehensive ESG information to assess a company's long-term value and risk profile [29].

Third, regulatory bodies and stock exchanges have implemented disclosure requirements and guidelines, such as the Global Reporting Initiative (GRI) framework and the Task Force on Climate-related Financial Disclosures (TCFD), to encourage transparency [20, 17].

While sustainability disclosure has made significant strides globally, its adoption and effectiveness in emerging markets like Nigeria present a unique context and set of challenges. Emerging markets are characterized by diverse industries, varying levels of economic development, and distinctive regulatory environments [15]. In these markets, sustainability disclosure may be influenced by factors such as resource constraints, lack of awareness, and differing stakeholder expectations [17].

The literature on sustainability disclosure in emerging markets underscores the importance of understanding the local context. Empirical studies have highlighted variations in disclosure practices among emerging economies and the significance of factors like industry type, firm size, and regulatory regimes [21, 28].

Information asymmetry

Information asymmetry is a fundamental concept in finance and economics, referring to a situation in which one party in a transaction possesses more or better information than the other party [17, 29]. In financial markets, information asymmetry can lead to adverse selection, moral hazard, and market inefficiencies. Investors, in particular, may face difficulties in evaluating firms and making informed investment decisions when information is unevenly distributed [11].

Research has shown that information asymmetry can result in a cost of capital increase for companies [21, 24]. In the context of sustainability disclosure, information asymmetry can manifest when companies fail to provide comprehensive and accurate ESG information, leaving investors with incomplete or inaccurate data. This can hinder investors' ability to assess the long-term sustainability and risk profile of a company [27].

Sustainability disclosure and information asymmetry

Sustainability disclosure plays crucial role in addressing information asymmetry in financial markets, especially as investors as increasingly consider ESG factors in their decision-making.

Comprehensive sustainability disclosure provides stakeholders, including investors, with a more complete picture of a company's ESG performance and its commitment to responsible business practices [13]. This transparency can reduce information asymmetry by bridging the gap between what companies know about their ESG performance and what stakeholders need to make informed decisions. Investors can use sustainability information to assess the long-term sustainability and risk profile of a company. When sustainability disclosure is robust and readily available, investors can make more informed investment decisions, contributing to efficient capital allocation [7, 9, 14].

By disclosing ESG risks and initiatives, companies can proactively address potential sources of information asymmetry. For instance, if a company reports on its efforts to manage environmental liabilities or ensure ethical supply chains, it can reduce the uncertainty associated with these risks [28]. Enhanced sustainability disclosure can also boost stakeholder confidence and trust in a company's management. When stakeholders perceive transparency in ESG matters, it can lead to more favorable relationships and support for the company's activities [19, 24, 30].

Sustainability disclosure serves as a means to reduce information asymmetry by providing stakeholders, particularly investors, with relevant information about a company's non-financial performance [29]. This transparency facilitates more informed decision-making, contributes to market efficiency, and supports responsible investment practices [24]. As sustainability continues to gain prominence in corporate reporting, its impact on addressing information asymmetry is likely to grow in significance. Consequently, it's imperative to examine the link between environmental, social and governance disclosure and information asymmetry;

Environmental disclosure and Information asymmetry

Environmental disclosure involves companies providing information about their environmental activities, performance, impacts, and initiatives in their financial and non-financial reports. Information asymmetry, on the other hand, refers to the unequal distribution of information among different stakeholders, leading to uncertainty and potential imbalances in decision-making [15, 25].

Environmental disclosure enhances transparency by providing stakeholders, including investors, regulators, and the public, with detailed information about a company's environmental practices and performance. It includes data on carbon emissions, resource use, waste management, and compliance with environmental regulations [21, 29]. When companies disclose their environmental performance and initiatives, they reduce information asymmetry by ensuring that stakeholders have access to critical information related to their environmental impact and sustainability practices. Environmental disclosure is particularly relevant for investors, including those focused on environmental, social, and governance (ESG) factors. Investors often assess a company's environmental performance when making investment decisions [28]. Transparent disclosure in this area helps reduce uncertainty and information asymmetry among investors.

Several countries have introduced mandatory environmental reporting requirements. Companies are legally obligated to disclose certain environmental information, including emissions data and sustainability performance [13]. This reduces the potential for information asymmetry, as stakeholders can rely on standardized disclosures. Even in the absence of mandatory requirements, companies can voluntarily participate in initiatives like the Global Reporting Initiative (GRI) or the Task Force on Climate-related Financial Disclosures (TCFD). These frameworks promote comprehensive environmental disclosure, reducing information gaps and asymmetry [12]. Effective environmental disclosure allows companies to identify and assess environmental risks and liabilities. When these risks are adequately disclosed, it prevents surprises and reduces information asymmetry, as stakeholders are aware of potential environmental challenges [31]. Non-compliance with environmental regulations can lead to legal consequences, regulatory actions, and reputational damage. Publicizing such events contributes to the reduction of information asymmetry, as they become part of the public record [18].

Consequently, environmental disclosure plays a crucial role in mitigating information asymmetry by promoting transparency, accountability, and stakeholder engagement. By providing comprehensive and accurate information about their environmental practices and performance, companies can reduce uncertainties and foster more informed decision-making among their stakeholders, ultimately contributing to sustainable and responsible business practices. This paper therefore hypothesises that;

Ho1: Environmental disclosure has no significant relationship with information asymmetry of listed industrial goods companies in Nigeria.

Social disclosure and information asymmetry

Social disclosure involves companies providing information about their social and ethical activities, initiatives, and impacts in their financial and non-financial reports. Information asymmetry, on the other hand, refers to the unequal distribution of information among different stakeholders, leading to uncertainty and potential imbalances in decision-making. Social disclosure enhances transparency by providing stakeholders, including investors, regulators, employees, and the public, with detailed information about a company's social and ethical practices [17]. It includes data on diversity and inclusion, employee well-being, community engagement, and ethical governance. When companies disclose their social practices and ethical initiatives, they reduce information asymmetry by ensuring that stakeholders have access to critical information related to their social impact and responsible business practices [16].

Social disclosure is particularly relevant for investors, including those focused on environmental, social, and governance (ESG) factors. Investors often assess a company's social performance when making investment decisions. Transparent disclosure in this area helps reduce uncertainty and information asymmetry among investors [27].

Effective social disclosure allows companies to identify and assess social risks and ethical challenges. When these risks are adequately disclosed, it prevents surprises and reduces information asymmetry, as stakeholders are aware of potential social and ethical issues [9]. Thus, Non-compliance with social and ethical regulations or ethical standards can result in legal consequences, regulatory actions, and reputational damage. Publicizing such events contributes to the reduction of information asymmetry, as they become part of the public record [29]. The paper therefore is of the view that;

Ho2: Social disclosure has no significant relationship with information asymmetry of listed industrial goods companies in Nigeria.

Governance disclosure and information asymmetry

Governance disclosure involves companies providing information about their corporate governance structures, policies, practices, and compliance in their financial and non-financial reports [10]. Information asymmetry, on the other hand, refers to the unequal distribution of information among different stakeholders, leading to uncertainty and potential imbalances in decision-making [22].

Governance disclosure enhances transparency by providing stakeholders, including investors, regulators, employees, and the public, with detailed information about a company's corporate governance framework. It includes data on board composition, executive compensation, audit committees, and adherence to governance codes. When companies disclose their governance structures and practices, they reduce information asymmetry by ensuring that stakeholders have access to critical information related to corporate oversight, compliance, and ethical governance [22].

Governance disclosure is particularly relevant for investors, as corporate governance practices can significantly impact a company's financial stability and reputation. Investors often assess a company's governance performance when making investment decisions. Transparent disclosure in this area helps reduce uncertainty and information asymmetry among investors [31].

Effective governance disclosure allows companies to identify and assess governance-related risks and ethical challenges. When these risks are adequately disclosed, it prevents surprises and reduces information asymmetry, as stakeholders are aware of potential governance issues. It is imperative to note that governance disclosure plays a crucial role in mitigating information asymmetry by promoting transparency, accountability, and stakeholder engagement [28]. By providing comprehensive and accurate information about their corporate governance structures, policies, and practices, companies can reduce uncertainties and foster more informed decision-making among their stakeholders, ultimately contributing to effective corporate governance and responsible business practices. The paper postulates the third hypothesis as thus;

Ho3: Governance disclosure has no significant relationship with information asymmetry of listed industrial goods companies in Nigeria.

Theoretical framework

Information Asymmetry Hypothesis

The theoretical framework underpinning the relationship between sustainability disclosure and information asymmetry posits that greater transparency through comprehensive sustainability reporting can mitigate information asymmetry [16, 17]. This hypothesis posits that information asymmetry can lead to adverse selection and moral hazard problems in financial markets. In the context of sustainability disclosure, it suggests that companies with poor ESG performance may be aware of their shortcomings while investors are not. By providing stakeholders with a more complete picture of a company's sustainability efforts and risks, disclosure can reduce uncertainty and information gaps. Sustainability disclosure can help mitigate adverse selection by providing information about a company's ESG performance [16]. When such information is disclosed, investors can make more informed decisions, reducing the potential for adverse selection issues associated with poor sustainability practices.

3. Methodology

This paper adopts a ex-post facto research design to comprehensively examine the relationship between sustainability disclosure and information asymmetry among industrial companies listed on the Nigerian Exchange Group (NGX). The research design made use of quantitative analysis of sustainability reports and financial data gathered through content analysis for a period of 10 years covering 2013 - 2022.

Quantitative data is collected from a sample of industrial companies listed on the NSE. The sample is selected based on criteria such as sector representation and availability of sustainability reports. Data for sustainability disclosure is primarily obtained from companies' annual sustainability reports, which are publicly available on corporate websites and through regulatory filings. Key sustainability disclosure indicators, including environmental, social, and governance (ESG) metrics, are identified and extracted from these reports. Financial data, including earnings reports and stock price information, are sourced from reputable financial databases and NSE publications. This data is crucial for analyzing the link between sustainability disclosure and information asymmetry in financial markets.

Variables and Measures

Dependent Variables

The dependent variable in this study is information asymmetry, which is quantified using bid-ask spreads. This financial market indicator reflects the degree of information asymmetry and its impact on stock trading behaviour.

Independent Variables

The primary independent variable is sustainability disclosure, operationalized through various ESG disclosure metrics extracted from sustainability reports. These metrics encompass environmental performance indicators, social responsibility initiatives, and governance practices.

Control Variables

Control variables are incorporated to account for factors that may influence information asymmetry independently of sustainability disclosure. These variables include firm size, turnover ratio and profitability.

Table 1. *Variable Specification.*

Independent Variables	Description of measurement	Code
Environmental Disclosure	Total GRI4 KPIs numeric scores for Environment	(ENV)
Social Disclosure	Total GRI4 KPIs numeric scores for society	(SOC)
Governance Disclosure	Total GRI4 KPIs numeric scores for Governance	(GOV)
Dependent Variables		
Information Asymmetry Proxies		
Absolute bid-ask spread	Weekly average differences between the best ask and the best bid prices; $ABS_w = \frac{1}{T}\sum_{t=1}^{T}(A_w - B_w)$	(ABS)
Control Variables		
Firm Size	The natural logarithm of assets	(SIZE)
Turnover Ratio	Cost of goods sold divided by inventory	(TOR)
Return on Equity	Net income divided by total equity	(ROE)

Source: Authors compilation (2023)

Model Specification

In an attempt to ascertain the relationship between sustainability disclosures and information asymmetry of listed industrial goods companies in Nigeria, the paper employed the following model:

$$Y = \beta_1X_1 + \beta_2X_2 + \beta_3X_3$$

Y = Response variable (information asymmetry)
$X_1 – X_3$ = Predictor variables (sustainability disclosure)
$\beta_1 - \beta_3$ = beta coefficients
INFOA = ABS
Thus;

$$ABS = ENVDI + SOCDI + GOVDI + SIZE + TOVR + ROE$$

Functional Form;

$$ABS = f(ENVDI + SOCDI + GOVDI + SIZE + TOVR + ROE)$$

Equation Form;

$$ABS_{it} = \beta_0 + \beta_1ENVDI_{it} + \beta_2SOCDI_{it} + \beta_3GOVDI_{it} + \beta_4SIZE_{it} + \beta_5TOVR_{it} + \beta_6ROE_{it} + \mu$$

Where;
ABS = Absolute bid-ask spread
ENVDI = Environmental Disclosure Index
SOCDI = Social Disclosure Index
GOVDI = Governance Disclosure Index
SIZE = Firm Size
TOVR = Turnover Ratio
ROE = Return on Equity
It = company *i* in time *t*
β_0 = Constant term
$\beta_1 - \beta_6$ = Regression coefficients
μ = Error term

4. Data Analysis

Table 2. *Descriptive Statistics.*

VARIABLES	N	Mean	S.D	Min	Max
ABS	130	17.93	23.46	11.46	42.92
ENVDI	130	13.33	18.97	2	3
SOCDI	130	19.53	28.61	2	3
GOVDI	130	7.86	16.65	1	3
SIZE	130	1.82	3.25	0.06	32.48
TOVR	130	2.44	0.33	2	3
ROE	130	7.20	1.42	4.62	31

Source: STATA (Version 14.2) Output

Table 2 shows the summary statistics of the nature of data used in conducting analysis in this study. The data were collected from 13 listed industrial goods companies for 10 years resulting to 130 observations. The statistics revealed that Absolute bid-ask spread (ABS) mean within the period of study was 17.93 with a standard deviation (SD) of 23.46, which is higher than the mean. This indicates a wide variation in the data for Absolute bid-ask spread (ABS) among the sampled companies for the period under consideration. Also, the mean value of Absolute bid-ask spread of 17.93 being above 1 indicates that the companies are doing well in reducing information asymmetry. The absolute bid-ask spread (ABS) also has a minimum and maximum value of 11.46 and 42.92 respectively. The table also showed Environmental Disclosure Index (ENVDI) with a mean 13.33 and a deviation of 18.97, which is higher than the mean. This shows that the data for ENVDI has a high variation among the sampled companies. The mean value on ENVDI of 13.33 being above 50% indicates that the company's disclosure on their environmental activities is quite commendable. Also, ENVDI has a minimum and maximum values of 2 and 3 respectively. The table furthermore showed that Social Disclosure Index (SOCDI) on average stood at 19.53 with a deviation of 28.61 which is higher than the mean. This indicates a wide variation in SOCD among the sampled companies for the period under study. The mean value on SCD of 19.53 being above 50% indicates that the companies did well in disclosure of their social activities. The statistics also showed SOCD with a minimum and maximum value of 2 and 3 respectively. The statistics also showed Governance Disclosure Index (GOVDI) with a mean of 7.86 and SD of 16.65. The deviation is higher than the mean indicating a wide variation in GOVD among the sampled companies in the period under study. The mean value on GOVD of 7.86 being above 50% indicates that the company's disclosure on their corporate governance activities is appreciative. Furthermore, the statistics revealed GOVDI with minimum and maximum values of 1 and 3 respectively. Additionally, firm size on average stood at 7.22 with standard deviation of 2.03 which is lower than the mean, this implies that there exists low variation in size among the sampled companies under consideration. The table further revealed minimum and maximum values of size as 4.81 and 31 respectively. Furthermore, the table showed that Turnover on average was 39.44 years with deviation of 14.19 indicating a low variation in age among the sampled companies. Minimum and maximum turnover of the companies was disclosed to be ₦17 million and ₦71 million respectively. Finally, profitability has a mean value of 16.39 with deviation of 23.99 which is greater than the mean. This indicates a wide variation in profitability among the sampled companies. The table also disclosed profitability with minimum and maximum values of 43.25 and 121.76 respectively.

Correlation Matrix

In order to check relationship existing between the study independent variables, the correlations statistics was employed to reveal the relationships existing among the study independent variables.

Table 3. *Correlation Matrix.*

	ENVDI	SOCDI	GOVDI	SIZE	TOVR	ROE
ENVDI	1.0000					
SOCDI	0.3991	1.0000				
GOVDI	0.4308	0.4744	1.0000			
SIZE	0.1028	-0.1386	-0.1493	1.0000		
TOVR	0.1772	0.1493	0.0351	0.2829	1.0000	
ROE	0.1833	-0.1737	-0.0776	-0.0544	0.0770	1.0000

Source: STATA 14.2 Output

Table 4. *Regression Result.*

Variables	Coefficients	Z	p>/z/
ENVDI	-0.0089	-2.37	0.021
SOCDI	-0.2397	-3.06	0.002
GOVDI	-0.1920	-2.93	0.003
SIZE	-0.8449	-2.04	0.041
TOVR	-0.9825	-2.42	0.015
ROE	0.1844	0.74	0.458
-cons	-1.5959	-6.68	0.000
R^2	0.4941		
F-Statistics	25.63		
Prob>F	0.0000		
Obs.	130		

Source: STATA (Version 14.2) Output

Table 3 presents the strength and type of relationship that exists between the study independent variables. A correlation coefficient which is above 0.75 is considered very high and could cause problems in the result. From table 3, all the variables are positively correlated indicating that they all move in the same direction. There exist no high correlations among the study variables as there exist no correlation that is above 75%. Therefore, the data is considered good for analysis.

Table 4 showed the regression result of sustainability disclosure and information asymmetry of listed industrial goods companies in Nigerian Exchange Group (NGX). The regression was conducted using data collected from 13 industrial goods companies for a period of 10 years, which resulted to a total number of 130 observations. The result disclosed R-square of 0.4941, implying that the relationship between the independent variables on the dependent variable employed in this study is 49.41%. This further indicates that the identified variables (environmental, social and governance disclosure) account for 49.41% of variation in the dependent variable information asymmetry among the companies under study, while the remaining 50.59 percent of the variation in information asymmetry is accounted for by other variables not included in the model. This indicates that ESG disclosure has moderate relationship with the reporting entity's information asymmetry. The table also showed F-statistics of 25.63, which signifies that the overall equation is significant at 0.0000 percent (below 1%) level, indicating that the model is fit to be used for interpretation.

The result showed that environmental disclosure (ENVD) has an insignificant negative relationship with information asymmetry with a coefficient of -0.0089. This means that any increase in ENVD by one unit will reduce information asymmetry of the sampled companies by 0.89%. The results of table 3 further revealed that social disclosure (SOCD) has a negative coefficient of -0.2397. This means that increase in SOCD leads to reduction in information asymmetry of the sampled companies by 23.97%. The regression results finally disclosed that governance disclosure with also a negative coefficient of -0.1920. This implies that a unit increase in governance disclosure leads to reduction in information asymmetry of the sampled companies by 19.20%. All things being equal, if the entire variables used in this study are held constant, ESG disclosure significantly reduces information asymmetry with a coefficient of 1.5959, z-value of 6.68 and p-value of 0.0000. This entails that increase in ESG disclosure will significantly reduce information asymmetry among the sampled companies.

4.1. Test of Hypotheses

The formulated hypotheses for this study are tested based on the GLS robust regression results presented in Table 4.

Ho1: Environmental disclosure has no significant relationship with information asymmetry of listed industrial goods companies in Nigeria.

Table 4 shows the z-value and the associated *p*-value for the test of this hypothesis. The first hypothesis of this study was tested using the critical region of non-rejection of the null hypothesis set at z-statistics of ±1.96 and 95% confidence interval. Given the calculated z-value of -2.37 which falls within the critical region of no rejection of the null hypothesis (±1.96) with *p-value* = 0.021 which is less than 5% level of significance, the study rejects the first null hypothesis and concludes that environmental disclosure significantly reduce information asymmetry of listed industrial goods companies in Nigerian Exchange Group (NGX).

Ho2: Social disclosure has no significant relationship with information asymmetry of listed industrial goods companies in Nigeria.

Table 4 also shows the z-value and the associated *p*-value for the test of this hypothesis. The second hypothesis of this study was tested using the critical region of non-rejection of the null hypothesis set at z-statistics of ±1.96 and 95% confidence interval. Given that the calculated value of z-value is -3.06 which falls outside the critical region of ±1.96, with *p-value* = 0.002 which is significant at 5%. This study failed to accept the second null hypothesis but rejects it and concludes that social disclosure significantly reduces information asymmetry of listed industrial goods companies listed in Nigerian Exchange Group (NGX).

Ho3: Governance disclosure has no significant relationship with information asymmetry of listed industrial goods companies in Nigeria.

Table 4 shows the z-value and the associated *p*-value for the test of this hypothesis. The third hypothesis of this study was also tested using the critical region of non-rejection of the null hypothesis set at z-statistics of ±1.96 and 95% confidence interval. Given that the calculated value of z-value = -2.93 which falls outside the critical region of ±1.96, with *p-value* = 0.003, lesser than 5% level of significance, this study fails to accept the third null hypothesis and concludes that governance disclosure significantly reduce information asymmetry of listed industrial goods companies listed in Nigerian Exchange Group (NGX).

4.2. Discussion of Findings

The findings drawn from the test of hypotheses are discussed in this section. The discussion of the findings is in accordance with the effect ESG disclosure have on information asymmetry of listed industrial goods companies in Nigeria.

Environmental disclosure and information asymmetry

The study found that environmental disclosure significantly reducing information asymmetry for listed industrial goods companies in Nigeria. This implies that when companies disclose environmental information, investors have access to more comprehensive data on a company's operations and risks. The significant effect can lead to increased investor confidence, as they can make more informed decisions about their investments. This can potentially attract more investment into the industrial goods sector in Nigeria. Companies that actively disclose their environmental performance and take steps to mitigate negative impacts can build a positive reputation. Lead to increased consumer trust, brand loyalty, and potential market advantages.

Social disclosure and information asymmetry

The paper found that social disclosure significantly reduces information asymmetry of listed industrial goods companies listed in Nigeria. This imply that social disclosure enables investors to assess a company's exposure to social and ethical risks, such as labor issues, human rights violations, and community relations. With reduced information asymmetry, investors can conduct more accurate risk assessments and develop strategies to manage and mitigate these risks effectively. Companies that actively disclose their social responsibility initiatives and ethical practices can build a positive reputation and enhance their brand value. A strong social responsibility image can attract socially conscious consumers and investors, potentially boosting sales and share prices. The findings can encourage industrial goods companies in Nigeria to adopt more responsible and sustainable business practices. Knowing that their social disclosures are under scrutiny can incentivize companies to improve their social and ethical performance. Beyond the business context, improved social disclosure can lead to positive societal outcomes. Companies that actively engage in social responsibility initiatives can contribute to community development, job creation, and the overall well-being of society.

Governance disclosure and information asymmetry

The study found that governance disclosure significantly reduce information asymmetry of listed industrial goods companies listed in Nigeria this imply that governance disclosure helps improve transparency and accountability within a company. When investors have access to comprehensive information about a company's governance structure, policies, and practices, it can lead to increased confidence in the management of the company. This can attract more investment into the industrial goods sector in Nigeria. Governance disclosure allows investors to assess a company's governance-related risks, such as conflicts of interest, board effectiveness, and ethical standards. Reduced information asymmetry enables investors to make more accurate risk assessments and better-informed investment decisions. This findings also imply that companies that actively disclose their governance practices can build a positive reputation for transparency and ethical behavior. A strong governance reputation can attract investors, customers, and business partners, enhancing the company's brand and market position.

5. Summary, Conclusion and Recommendations

The study conducted on sustainability disclosure which comprised of; environmental, social, and governance (ESG) disclosure in listed industrial goods companies in Nigeria has revealed significant effects on information asymmetry. ESG disclosure has emerged as a crucial factor influencing transparency and decision-making in this sector. Environmental disclosure has provided investors and stakeholders with valuable insights into a company's environmental performance, risk exposure, and commitment to sustainability. This has led to improved investor confidence, better risk assessment, and a more favorable reputation for environmentally responsible companies. Social disclosure, on the other hand, has shed light on a company's social responsibility initiatives, ethical practices, and engagement with communities and stakeholders. This has positively impacted investor confidence, risk assessment, and corporate reputation, while also contributing to societal well-being. Governance disclosure has strengthened transparency and accountability within companies, enabling investors to assess governance-related risks and management effectiveness. As a result, governance disclosure has improved investor confidence, mitigated corporate scandals, and aligned Nigerian industrial goods companies with international standards.

Conclusion

In conclusion, the study demonstrates that ESG disclosure plays a pivotal role in reducing information asymmetry in the Nigerian industrial goods sector. The effects of such disclosure are far-reaching, encompassing improved investor confidence, better risk assessment, enhanced corporate reputations, and market stability. ESG disclosure is not only a regulatory requirement but also a strategic imperative for companies seeking to attract responsible investors and foster long-term sustainability.

Recommendations

Based on the findings of this study, the following recommendations are offered:

1) Listed industrial goods companies in Nigeria should continue to enhance their ESG disclosure practices. This includes providing more detailed and transparent information on environmental, social, and governance aspects to reduce information asymmetry further.
2) Companies should invest in educating investors, stakeholders, and the public about the importance of ESG disclosure and its impact on decision-making. This can help create a more informed and responsible investment community.
3) Companies should consider conducting regular audits and third-party verification of their ESG disclosures to ensure accuracy and reliability, enhancing their credibility.
4) Companies should view ESG disclosure as an ongoing process of improvement. They should continuously assess their practices and align them with emerging international standards and best practices.
5) Regulators in Nigeria should continue to develop and enforce regulations related to ESG disclosure, ensuring that companies comply with reporting requirements. This will help maintain market integrity and transparency.
6) Investors should actively engage with companies on ESG issues, encouraging them to adopt responsible practices and improve disclosure. Responsible investment strategies can promote ESG considerations in decision-making.
7) Both companies and investors should recognize that the benefits of ESG disclosure are often realized over the

long term. A commitment to sustainability and responsible practices can contribute to the stability and growth of the industrial goods sector in Nigeria.

Incorporating these recommendations into corporate practices and regulatory frameworks can further enhance the positive effects of ESG disclosure, reduce information asymmetry, and foster a more sustainable and transparent industrial goods sector in Nigeria.

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