Effect of Economic and Social Sustainability Reporting on Firm Value of Listed Manufacturing Companies in Nigeria: Moderating Role of Information Asymmetry

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Abstract

This study investigates the moderating role of information asymmetry in shaping the effect of economic and social sustainability reporting on the firm value of listed manufacturing companies in Nigeria. Utilizing an ex-post facto research design, the study draws on a stratified sample of 29 manufacturing firms from a population of 43 listed on the Nigerian Exchange Group as of December 31, 2022. Spanning from 2007 to 2022, the study collects secondary data from annual reports, Nigeria All Share Index reports, and sustainability reports. Employing descriptive and inferential statistics, along with multiple regression techniques, the analysis considers Firm value (FV) as the dependent variable, Economic sustainability reporting (ECO) and Social sustainability reporting (SOC) as independent variables, and Information asymmetry (IA) as the moderating variable. Results indicate that economic sustainability reporting has a positive but insignificant effect on the firm value of listed manufacturing companies in Nigeria. In contrast, social sustainability reporting displays a negative and significant impact on firm value. Notably, information asymmetry shows a positive and significant effect on the relationship between social sustainability reporting and firm value, while it exhibits a positive but insignificant effect on the relationship between economic sustainability reporting and firm value. The study recommends that Nigerian manufacturing should enhance social sustainability reporting to mitigate information asymmetry and bolster firm value and should also improve economic sustainability reporting through the implementation of measures to reduce information asymmetry for long-term sustainable value creation.

Keywords: Firm Value, Economic Sustainability Reporting, Social Sustainability Reporting,

Manufacturing Companies

1.0 Introduction

In the intricate tapestry of financial markets, firm value acts as a guiding compass for investors, analysts, and stakeholders as they navigate the complex landscape of corporate worth. It encapsulates the collective assessment of these key players regarding an organization's current and future prospects (Lopez et al., 2007). Firm value transcends traditional financial metrics and is instead influenced by a multitude of factors, including strategic decisions, external economic conditions, and a company's broader social and environmental responsibilities (Carnevale et al., 2012). It is the comprehensive measure of a company's worth, considering aspects such as investor trust, access to capital, social reputation, environmental responsibility, and market competitiveness (Ammer et al., 2020). Various indicators, such as asset market value, liability market value, management efficiency, profit growth, and stock price fluctuations, are utilized to assess a company's valuation. However, this study primarily employs the quoted market value per share for each entity as the key measure of firm value due to its ability to promptly reflect investor and market sentiments.

Companies employ diverse strategies to attain an acceptable level of firm valuation. Among these strategies, the use of sustainability reporting stands out as a potent tool to enhance corporate value.

Sustainability reporting is a transparent process through which organizations communicate their economic, environmental, and social performance to a range of stakeholders, including shareholders, investors, customers, regulatory bodies, and the public (Kolk, 2008). This reporting mechanism encompasses the disclosure of data, metrics, and narratives, shedding light on a company's commitment to sustainable practices, ethical governance, and responsible corporate citizenship.

Globally, investors are increasingly factoring sustainability performance into their investment decision-making processes (Suryaningsih & Handayani, 2022). Consequently, corporate entities are considering sustainability initiatives as a strategic approach to enhance their appeal to the public and potential investors. However, when engaging in sustainability reporting, a significant disconnect can emerge between the information disseminated by corporate management through sustainability reports and what is available to primary external stakeholders, particularly investors. This disconnect raises complex issues related to the level of detail in disclosed information, the alignment of corporate actions with sustainability goals, and the capacity of external stakeholders to interpret and respond to the data. This phenomenon is termed 'information asymmetry,' highlighting the unequal access to information between corporate entities and external stakeholders (Afzal, 2015). It signifies that crucial information about a company's sustainability performance may not be adequately conveyed, impeding the effectiveness of sustainability reports.

Moreover, information asymmetry can significantly influence a company's value. The mere presentation of sustainability reports is insufficient to impact a firm's value unless these reports engage in meaningful dialogues with stakeholders. Addressing information asymmetry becomes a critical concern for companies seeking to maximize the benefits of sustainability reporting and enhance their market value.

In Nigeria, a country with abundant natural resources and a growing manufacturing sector, the influence of sustainability reporting on the firm value of companies within the sector is of paramount importance. The manufacturing industry plays a vital role in the Nigerian economy, contributing to employment, export earnings, and overall economic growth. However, companies in this sector face challenges related to environmental degradation, social inequality, and transparency in corporate practices. This study focuses on the economic and social aspects and their role in affecting the firm value of manufacturing companies (Emeka & Benjamin, 2019).

In the dynamic landscape of the Nigerian manufacturing sector, understanding the factors that influence firm value is of paramount importance, as it directly impacts the economic growth and sustainability of these companies in a country blessed with rich natural resources and emerging industrial potential.

According to Anudu (2020), the Nigerian manufacturing sector has grappled with a substantial decline in firm value, largely attributed to labor strikes initiated by dissatisfied employees. These labor strikes, stemming from concerns related to working conditions and compensation, not only garnered substantial negative media attention but also induced a palpable erosion of investor confidence in the Nigerian manufacturing sector. This decline in investor confidence was notably reflected in the remarkable 6.6% reduction in the total market capitalization of the manufacturing sector in 2020 (Agency report, 2017). This discernible trend underscores the critical role of social factors, specifically labor unrest, in exerting a significant and detrimental impact on the firm value of manufacturing companies.

Furthermore, findings from a report by Faminu (2021) accentuate the economic challenges faced by the Nigerian manufacturing sector. The Manufacturing Association of Nigeria (MAN) acknowledged the substantial outflow of manufacturing companies from the Nigerian market, with an increasing number of firms relocating to neighboring markets such as Ghana and Benin Republic, as reported by Agency report (2017). One prominent example is the case of Dunlop Nigeria Plc., which shut down its operations in

Nigeria and relocated to Ghana due to the high production costs and the economically unstable conditions within the Nigerian economy (Oyati, 2012). These circumstances have further exacerbated the difficulties faced by manufacturing companies in engaging in activities that promote economic sustainability.

In sum, the challenges faced by manufacturing companies in Nigeria, including labor strikes, economic instability, and the migration of firms to neighboring markets, have raised pressing concerns about their ability to maintain and enhance firm value. Therefore, this study aims to investigate if economic and social sustainability reporting have an effect on the firm value of listed manufacturing companies in Nigeria.
It is important to note that that numerous studies have It is important to note that numerous studies have been carried out on the effect of sustainability reporting and firm value which have yielded varying results with some results from researchers like Bose et al. (2017); Khan et al. (2011) and Wu & Shen (2013) showing a positive and significant relationship between sustainability reporting and firm value while some showing negative relationship or no relationship (Carnevale et al., 2012; Cormier & Magnan, 2007). In this regard, this study seeks to use information asymmetry as a moderator to examine the underlying mechanisms and conditions that affect the effect of sustainability reporting on firm value of listed manufacturing companies in Nigeria. This to best of the researcher's knowledge has not been used in the Nigerian context. Therefore, the main objective of this study is to examine whether information asymmetry moderates the effect of economic and social sustainability reporting on firm value of manufacturing companies in Nigeria.

In line with the above research objectives the following hypotheses are stated in the null form and to be tested

H_{O1}: Economic sustainability reporting has no significant effect on firm value of listed manufacturing companies in Nigeria.

H_{O2}: Social sustainability reporting has no significant effect on firm value of listed manufacturing companies in Nigeria.

H_{O3}: Information asymmetry has no significant effect on firm value of listed manufacturing companies in Nigeria.

H_{O4}: Information asymmetry has no significant effect on the effect of economic sustainability reporting on firm value of listed manufacturing companies in Nigeria.

H_{O5}: Information asymmetry has no significant effect on the effect of social sustainability reporting on firm value of listed manufacturing companies in Nigeria.

The study's findings carry significant implications for a range of stakeholders. Firstly, investors and shareholders can benefit from a deeper comprehension of how sustainability reporting impacts firm value, enabling them to make more informed investment decisions. Corporate managers and executives can glean valuable insights from the findings regarding the strategic alignment of sustainability practices with business objectives, potentially bolstering stakeholder trust and financial performance. Regulators and policymakers have the opportunity to employ these insights in refining regulations and policies concerning sustainability reporting, thereby fostering greater transparency and accountability within the manufacturing sector.

Moreover, industry associations and advocacy groups can leverage the findings to champion responsible business practices and advocate for broader adoption of sustainability reporting. Consumers and communities, in turn, can make more informed purchasing decisions with increased transparency, thereby supporting companies committed to sustainability and social responsibility. Overall, the significance of the findings transcends individual companies to impact the broader business landscape in Nigeria, facilitating sustainable development, ethical practices, and long-term value creation for all stakeholders involved.

Spanning a 15-year period from 2007 to 2022, the study comprises six sections: introduction, literature review, methodology, data presentation and analysis, conclusion, and recommendations.

2.0 Literature Review

This section discusses conceptual definitions, theoretical issues, and relevant empirical literatures. This would allow for a creation of in-depth understanding of the independent, dependent, and moderating variables related to the study.

2.1 Conceptual Review

The concept of firm value lacks a universally accepted definition, as various scholars have approached its delineation through differing criteria. The variance in definitions can be attributed to divergent interpretations of what constitutes value within a firm. In the early 1990s, Miller & Modigliani (1961) espoused the view that firm value represents the intrinsic worth of a company, irrespective of its capital structure. Their definition centers on the fundamental value of the firm, emphasizing its resilience to fluctuations in financing methods.

Conversely, in the period preceding the 2000s, Kaplan and Ruback (1995) adopted a financial perspective to define firm value as the market capitalization of a company, calculated by multiplying the number of outstanding shares by the market price per share. Their definition accentuates the significance of market dynamics and investor sentiment in shaping the determination of firm value, marking a composite perspective regarding its denotation.

Similarly, Srinivasan and Hanssens (2009) provided an alternative definition, characterizing firm value as the comprehensive economic worth of a company's assets and operations. This definition reflects the combined valuation of a company's assets, encompassing both tangible and intangible assets, as assessed by investors and stakeholders.

Another perspective on firm value is presented by Huynh et al. (2020), who define it as the collective evaluation by investors of a firm's present and future condition. This definition scrutinizes firm value from the standpoint of its performance within the business environment and is often manifested in the firm's share price.

Within the realm of academic discourse, the measurement of firm value has been undertaken through various metrics, including Tobin's q (Aondoakaa & Isaac, 2019), market capitalization (Yulianingsih et al., 2018), discounted cash flow analysis (Harymawan et al., 2020), price-to-earnings ratio (Sanusi & Sanusi, 2019), enterprise value (Syder et al., 2020), and market value per share (Gitahi et al., 2018). It is crucial to underscore that the choice of measurement method is contingent upon the specific characteristics of the firm under consideration and the intended purpose of the valuation technique (Zahirul Islam, 2012). For the purposes of this study, the measurement of firm value is anchored in the concept of market value per share. This selection is predicated on the premise that, unlike other metrics, market value per share provides a real-time reflection of the market's perception of a firm's worth at any given juncture.

As delineated by the Global Reporting Initiative (GRI, 2022), economic sustainability embodies the judicious utilization of extant resources through a spectrum of strategies, with the overarching aim of achieving a conscientious and advantageous equilibrium over the long term. This concept extends beyond the sole purview of a reporting company's fiscal performance to encompass a broader terrain, considering the company's influence on the economic well-being of its stakeholders, as well as its role within the local, national, and global economic systems in which it operates, as articulated by Bartlett (2012).

In a similar vein, Yusoff and Adamu (2016) expound on economic sustainability reporting, characterizing it as a practice wherein companies and organizations disseminate public disclosures concerning their economic performance and financial robustness. They underscore that economic sustainability reporting pivots on the provision of information to stakeholders concerning a company's financial stability, its proclivity for long-term economic viability, and its impact on the broader economy in a holistic sense.

The Global sustainability standards board (2023) provides a comprehensive definition of social sustainability reporting, characterizing it as the systematic process through which organizations disseminate information regarding their performance and influence across a diverse spectrum of facets associated with social sustainability. Within this framework, social sustainability reporting encompasses the disclosure of details concerning an organization's policies, initiatives, and undertakings that bear relevance to individuals, communities, and other pertinent stakeholders.

In an alternate view, Ali et al. (2017) elucidates the concept of social sustainability reporting, accentuating its pivotal role as a significant communication tool for companies to convey their unwavering commitments and advancements in the realm of sustainable and ethical business practices to a wide array of stakeholders, which encompasses shareholders, customers, employees, and local communities. This communication approach manifests itself through the provision of transparent insights into a company's societal and environmental impact, as well as their endeavors to ameliorate adverse consequences and contribute to positive societal outcomes.

It is noteworthy that this study employs the GRI Content Index, as offered by the Global Reporting Initiative, as the benchmark for measuring both economic and social sustainability reporting, thus aligning with a globally recognized framework.

For investors, the acquisition of pertinent and accurate information stands as the pivotal prerequisite in shaping their investment decisions, underpinning the foundational premise of an efficient market. Nonetheless, the pervasive observation of asymmetric information, as opposed to information efficiency, permeates many global marketplaces, with Nigeria constituting no exception to this phenomenon. Pioneered by Akerlof (1970), the concept of information asymmetry is defined as a scenario where sellers possess superior information concerning the quality of products, thus giving rise to the potential for adverse selection, particularly concerning lower-quality products. This disparity in information quality establishes a discernible advantage for one party over the other, as elucidated by Afzal (2015).

2.2 Theoretical Review

The information asymmetry theory delineates a scenario where one party involved in a transaction possesses a superior or more comprehensive set of information in comparison to the other party. This asymmetric distribution of information engenders an inherent imbalance of power and the potential for one party to exploit their informational advantage. Information asymmetry is a phenomenon frequently encountered in various contexts, including consumer-seller interactions, employer-employee relationships, organizational stakeholder dynamics, principal-agent relationships, and financial markets, as explicated by Cho et al.(2013).

The genesis of the Information Asymmetry Theory can be traced back to economist George Akerlof, who, in his seminal 1970 paper titled "The Market for Lemons: Quality Uncertainty and the Market Mechanism," formally delineated this theory. Akerlof's definition of information asymmetry theory involves a situation in which one party in a relationship possesses more extensive or superior information than the other (Akerlof, 1970). This theory is instrumental in elucidating the intricate interplay between sustainability reporting and its potential influence or lack thereof on firm value.

Furthermore, it is imperative to delve into the nuanced relationship between sustainability reports, information asymmetry, and firm value. The presence of information asymmetry within the context of sustainability reporting can significantly affect the understanding and evaluation of a firm's value. In cases where companies either intentionally or inadvertently withhold or manipulate information within their sustainability reports, stakeholders, particularly investors, may be operating with incomplete or even inaccurate data. Such information asymmetry can lead to a distortion in perceptions of a firm's economic and social performance. Consequently, the interplay between information asymmetry, sustainability reporting, and firm value warrants in-depth analysis and exploration within the Nigerian manufacturing sector, as it has the potential to influence investment decisions and stakeholder confidence. In essence, this research endeavors to shed light on the implications of information asymmetry in the context of sustainability reporting and its impact on the firm value of Nigerian manufacturing companies.

2.3 Review of Empirical Studies

Utami (2015) examined the influence of leverage, profitability, and the quality of sustainability disclosure on firm value in Indonesia between the years 2010 and 2016. The study adopted a causal research design, and the purposive sampling technique was adopted to arrive at a sample size of 143 firm years. The multiple regression analysis technique was used to analyze the data set gotten from the firm's annual report. The findings of the study revealed that economic sustainability reporting has no significant positive influence on the firm value of Indonesian firms. Utami's 7-year study in Indonesia is extended and enhanced in this research, which spans 15 years and includes the Nigerian context, thereby contributing valuable insights to the African perspective.

In contrast, Yusoff and Adamu (2016) investigated the economic sustainability activities of the top 100 companies in Malaysia and their relationship to the company's financial performance from 2009 to 2013. The research adopted the quantitative research type, and the exploratory research design was used in order to achieve the objective of the study. Secondary data was derived from the annual reports of the top 100 companies, and content analysis using the CSR index served as the basis from which the data was extracted for the research. A Simple regression was adopted as the data analysis technique, which produced findings that revealed that economic sustainable disclosures had a positive and significant effect on the firm performance of the top 100 Malaysian companies.

Similarly, Ellili and Nobanee (2022) investigated the degree of sustainability disclosure of listed banks in the UAE financial markets and the effects of sustainability disclosure on banking performance using a study period of 11 years (2003–2013). The sample size used by the study was stratified into 2 bank types: conventional banks and Islamic banks, which had 12 and 4 banks, respectively. Secondary data was extracted from the annual reports of the banks. The study made use of the generalized method of moments (GMM) to analyse the dynamic panel regression equation. The empirical results showed that sustainability disclosure levels are low. However, economic sustainability disclosure levels had a positive and significant impact on bank performance. Although the 11-year timeframe is robust, it does not align with the current economic conditions. To address this, the study will extend the timeline to 15 years, concluding in 2022.

Zahirul Islam (2012) examined the impact of social sustainability reporting on the financial value of listed banking companies on the Dhaka Stock Exchange, Bangladesh, between the periods of 2010 and 2011. The study used a combination of secondary data and primary data. Secondary data was derived from 30 annual reports from nine Bangladeshi banks, and primary data was derived from questionnaires answered by company employees and members of civil society groups. Regression analysis and coefficient variation were used to analyze the secondary and primary data, respectively. The study found social sustainability reporting has an effect on corporate financial performance, thus having an impact on the overall value of

the banks listed on the Dhaka Stock Exchange. The study reviewed here considers only a 2-year time period which this study improves upon by considering a 15-year time period and also dwells into the domain of manufacturing companies thereby expanding the knowledge base of the subject matter.

Also, Palmer (2012) investigated the impact of social sustainability reporting on sales and gross margins of listed firms in the USA between the years 2001 and 2005. The study measured corporate social responsibility using the Morgan Stanley Capital International ESG Index (MSCI ESG index), while sales and gross margin were measured using total sales to total assets and gross profit to total sales, respectively. A total of 333 firms were used for the study, and secondary data was derived from the firms' annual reports and MSCI index. Multiple regression and correlational analysis were used to analyze the data. The study findings revealed a clear and mutually beneficial relationship between corporate social sustainability reporting performance and corporate financial performance. This supports the notion that Sustainability programs yield positive effect on a company's financial results. Moreover, the results suggest that an increase in corporate social sustainability reporting performance reflected an improved company performance and, over time, enhances the company's market position and overall value.

In contrast, Wahyuandari et al. (2022) examined the influence of the disclosure of social sustainability reporting on the value of state-owned enterprises in Indonesia over a 5-year period (2014–2018). The study adopted the quantitative approach in sourcing its data (secondary data) and made use of the purposive sampling technique in reaching its determined sample size of 20 companies. The used SEM (structural equation modeling) with a variance-based approach as a method of analyzing the data. A variation-based approach and component-based partial least squares were also employed with the help of SmartPLS. The study showed that sustainability reporting, especially social sustainability reporting, has a significant negative effect on the firm value of state-owned companies listed in Indonesia, as most investors are more interested in financial factors than non-financial factors in the Indonesian market.

Huynh et al. (2020) examined the relationship between information asymmetry and firm value in Vietnamese firms from 2008 to 2017. The study utilized secondary data collected from the Vietnamese stock exchange. A sample size of 250 firms, excluding financial firms, was used for the analysis. The study used the pooled OLS and employed the REM and FEM to generate appropriate results based on the panel data extracted from the annual reports of the firms. A one-step GMM was used to exclude endogenous errors and test the sustainability of the model used for the estimation of the dataset. The findings of the study revealed that, fundamentally, information asymmetry in Vietnamese firms has a negative effect on firm value and thus must be managed.

3.0 Research Method

This study employs an ex-post facto research design to investigate the moderating effect of information asymmetry on the impact of economic and social sustainability reporting on the firm value of listed manufacturing companies in Nigeria. This design is suitable because it examines past events beyond the researcher's control. The study's population is drawn from manufacturing firms listed on the Nigerian Exchange (NGX) website. However, the NGX website lacks a specific classification for manufacturing firms. Instead, it categorizes Nigerian firms into agriculture, conglomerates, construction/real estate, consumer goods, financial services, healthcare, ICT, industrial goods, natural resources, oil and gas, and services.

To address this classification gap, the author adopts Shahin (2015) definition of manufacturing firms, which refers to organizations engaged in producing goods through the transformation of raw materials or components into finished products using physical and chemical processes. Companies falling under the NGX classifications of natural resources, services, construction/real estate, financial services, and ICT are

excluded from the potential manufacturing population. The remaining classifications, namely agriculture, conglomerates, consumer goods, healthcare, industrial goods, and oil and gas, are subjected to specific selection criteria to determine the final study population of 43 firms. These criteria involve identifying keywords such as "production" and "manufacturing" within the nature of the business section provided in each company's profile as published on the NGX website. Table 1 shows the population after selection criteria at a glance.

Table 1

Population after selection criteria Size of the study

S/No	NGX classification	No of Companies
1	Agriculture	5
2	Conglomerates	2
3	Consumer goods	16
4	Health care	6
5	Industrial goods	11
6	Oil and gas	3
	Total	43

Source: Author's compilation 2023

The initial population of 43 manufacturing companies was stratified into six groups, aligning with the classification provided on the Nigerian Exchange Group website. A stratified sampling technique was subsequently employed to determine the final sample size for the study.

Table 2

Stratified Sample Size of the study

S/No	NGX classification	No of Companies	Stratified Sample
1	Agriculture	5	3
2	Conglomerates	2	1
3	Consumer goods	16	11
4	Health care	6	4
5	Industrial goods	11	8
6	Oil and gas	3	2
	Total	**43**	**29**

Source: Author's compilation 2023

Table 2 shows the stratified sample size of manufacturing firms as extracted from the Nigerian exchange group website as of December 31, 2022, is 29 listed manufacturing companies. The sample of the study comprises 3 agriculture-based companies, 1 conglomerate, 11 consumer goods companies, 4 health care companies, 8 industrial goods companies, and 2 oil and gas companies. The names of the companies that constitute the sample are provided in appendix A1.

3.1 Model specification

The study adapts the model used by the study adapts the model used by Emeka and Benjamin (2019). The model is modified to suit the variables of the study and the regression analysis. Elements of economic and social sustainability reporting are represented using social (Soc) and economic (Eco). Firm value is the dependent variable, which is measured by market share price. The moderating variable is information asymmetry (IA) (bid-ask spread). The regression model is presented below:

$$\text{Log } Fv_{it} = \alpha_0 + \beta_1 Soc_{it} + \beta_3 Eco_{it} + \beta_4 IA_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Depicting the direct relationship between the Variables

$$\text{Log} Fv_{it} = \alpha_0 + \beta_1 Soc_{it} + \beta_3 Eco_{it} + \beta_4 IA_{it} + \beta_5 (Soc * IA) + \beta_7 (Eco * IA) + \varepsilon_{it} \ldots\ldots \quad (2)$$

Depicting the moderated relationship between the variables
Where:

Fv = Firm value (Market share price)
Soc = Social sustainability reporting
Eco = Economic sustainability reporting
IA = Information asymmetry
β_1 = Regression coefficient
α_0 =Constant
i = Cross sections
t = Time
ε = Stochastic error term

3.2 Variable definition and Measurement

Table 3
Variables Definition, Measurement and Sources

Variable	Symbol	Type	Measurement	Sources
Sustainability reporting				
Economic sustainability reporting	Eco	Independent variable	Number of Economic disclosure index fulfilled by a company divided by Total Economic disclosure index as per GRI guidelines	GRI (2022)
Social sustainability reporting	Soc	Independent variable	Number of Social disclosure index fulfilled by a company divided by Total Social disclosure index as per GRI guidelines	GRI (2022)
Firm Value				
Quoted market price/ share	Fv	Dependent variable	Quoted Market price per share	(Nguyen, 2020; Reddy & Lucus, 2010)

Moderating Variable:				
Information Asymmetry	IA	Moderating variable	Ask price minus bid price divided by closing price	(Cho et al., 2013; Martínez-Ferrero et al., 2018)

Source: Authors compilation (2023)

3.4 Estimation test

This study used post-estimation techniques to validate the results obtained from the regression analysis. Firstly, a normality test was conducted to assess the distribution of the residuals. The Shapiro-Wilk test was employed, with the decision rule set at a significance level of 0.05. A p-value greater than 0.05 would indicate that the residuals are normally distributed, validating the assumption of normality (Field, 2013).

Secondly, a Hausman test was performed to determine the appropriate model specification between fixed effects and random effects. The decision rule for this test was based on the significance level of 0.05 (Dahiru, 2016). A significant Hausman test suggests that the random effects model is inconsistent, and the fixed effects model should be preferred.

Additionally, multicollinearity was assessed using the Variance Inflation Factor (VIF). The VIF measures the extent to which the variance of an estimated regression coefficient is inflated due to multicollinearity. A VIF value greater than 10 indicates high multicollinearity, suggesting that the independent variables may be too highly correlated (Moreno & Casillas, 2008; Soares & Perin, 2019). In such cases, remedial actions such as dropping highly correlated variables or employing ridge regression may be warranted.

Result and Discussion

This focuses on descriptive statistics, correlation matrix result and interpretation of the summarized regression results, policy implications and recommendations based on findings.

Descriptive statistics

This describes the characteristics of the data obtained based on the variables of the study. Below are the outcomes shown in the descriptive statistics table.

Table 4

Descriptive statistics

Variable	Obs	Mean	Std. dev.	Min	Max
FV	381	0.904194	0.47365	0.005816	1.988066
ECO	381	0.447507	0.233881	0	1
SOC	381	0.661726	0.255058	0	1
IA	381	0.123763	0.145109	0.000328	0.95604

Source: STATA Output (2023)

Table 4 shows the descriptive statistic for the variables of the study comprising of the Firm value (FV), Economic sustainability reporting (ECO), Social sustainability reporting (SOC) and Information asymmetry (IA). In this dataset comprising 381 observations, the table shows Firm Value with a mean value approximately 0.904194, suggesting that, on average, the firm value falls close to this figure. The

standard deviation of 0.47365 indicates a moderate level of dispersion in firm values across the dataset, and the range extends from a minimum of 0.005816 to a maximum of 1.988066, underlining the variability in firm value within the sample.

Similarly, Economic Sustainability (ECO) displays a mean value of approximately 0.447507, signifying that, on average, economic sustainability scores tend to cluster around this value. The standard deviation of 0.233881 indicates a moderate degree of dispersion, while the variable's range spans from the minimum value of 0 to the maximum value of 1, emphasizing the presence of a wide range of economic sustainability scores in the dataset. In the same vein, Social Sustainability dataset reveals a mean value of approximately 0.661726, suggesting that, on average, social sustainability scores are concentrated around this figure. The standard deviation of 0.255058 implies a moderate level of variation in social sustainability scores, and the variable's range extends from a minimum score of 0 to a maximum score of 1, illustrating the diversity of social sustainability measures in the dataset.

Lastly, the Information Asymmetry variable demonstrates a mean value of approximately 0.123763, indicating that, on average, information asymmetry levels are close to this value. The standard deviation of 0.145109 shows a moderate degree of dispersion in information asymmetry level. The variable's range spans from a minimum of 0.000328 to a maximum of 0.95604, signifying the presence of various levels of information asymmetry within the dataset.

Correlation Matrix

The correlation result which quantifies the degree of association or relationship between the dependent and independent variables is presented in Table 5.

Table 5

Correlation Matrix

Variable	FV	ECO	SOC	IA
FV	1.0000			
ECO	0.2201*	1.0000		
	0.0000			
SOC	0.0533	0.8055*	1.0000	
	0.2993	0.0000		
IA	0.0079	-0.3649*	-0.3411*	1.0000
	0.8783	0.0000	0.0000	

Source: STATA Output (2023)

In Table 5, the correlation analysis reveals interesting relationships among the variables in the dataset. Firm Value (FV) exhibits a strong positive correlation with Economic Sustainability Reporting (ECO) with a correlation coefficient of 0.2201*. This suggests a modest positive association between firm value and economic sustainability. Similarly, Economic Sustainability Reporting (ECO) is also significantly positively correlated with Social Sustainability Reporting (SOC) with a high correlation coefficient of 0.8055*, indicating a strong positive relationship between these two variables.

However, Social Sustainability Reporting (SOC) displays a weak positive correlation with Information Asymmetry (IA) with a coefficient of 0.0533, and this correlation is not statistically significant (p = 0.2993).

Information Asymmetry (IA) exhibits a moderate negative correlation with both Social Sustainability Reporting (SOC) and Economic Sustainability Reporting (ECO) with correlation coefficients of -0.3649* and -0.3411*, respectively. These correlations indicate that as information asymmetry increases, social and economic sustainability reporting tend to decrease.

In summary, the correlation analysis highlights the varying degrees of association between the variables. Firm Value shows a modest positive correlation with Economic Sustainability Reporting, while Economic Sustainability Reporting and Social Sustainability Reporting demonstrate a strong positive relationship. On the other hand, Information Asymmetry exhibits negative correlations with both Social and Economic Sustainability Reporting, implying that higher levels of information asymmetry are linked to reduced sustainability reporting in these domains.

Regression Result

This shows the result of the effect of the independent variable on the dependent variable and the moderating effect of the moderator on the effect of the independent variable on the dependent variable. Below are the outcomes shown in the regression table.

Table 6

Summary of Regression Result

Variables	Coefficient	t- values	P-Values	VIF	Tolerance Value
ECO	0.1743	0.99	0.330	2.92	0.3420
SOC	-0.3265	-2.16	0.039	2.87	0.3487
IA	-0.4999	-3.77	0.001	1.16	0.8605
ECOIA	0.6620	0.68	0.499		
SOIA	1.0812	2.00	0.055		
R^2					0.16
Adj R^2					0.15
F- Sig					0.000
F- Stat					13.39
Hettest Chi^2					0.0007
Hausman Chi^2					0.0005

Sources: STATA output (2023)

The study underwent post-regression analysis to identify the optimal model for interpreting the results, utilizing the Best Linear Unbiased Estimators (BLUE) to ensure valid inferences. A heteroskedasticity test was executed on the data, revealing a significant Chi^2 value of 0.0007, indicating unequal data spread within the study model. Subsequently, the Hausman specification test, yielding a significant Chi^2 of 0.0005, was employed to determine the best-fit model, resulting in the selection of the fixed effect model. Given the

earlier identified heteroskedasticity, robust fixed effects were employed to address this issue during the interpretation of the study results.

Additionally, Variance Inflation Factor (VIF) and Tolerance Values were assessed following rule-of-thumb criteria. The VIF consistently exhibited values below ten (10), and corresponding Tolerance Values consistently remained below one (1), affirming the absence of multicollinearity among the independent variables.

Furthermore, the Cumulative R-Squared, indicating the percentage of total variation in the dependent variable collectively explained by all independent and moderating variables, was found to be 0.16. This suggests that 16% of the variation in the dependent variable is jointly determined by the independent and moderating variables. This result is corroborated by the F-Stat and F-Sig values of 13.39 and 0.000, respectively, signifying the model's fitness at the 1% significance level.

Hypothesis One (Economic sustainability reporting and firm value of listed)

From Table 6, ECO with a positive coefficient value of 0.1743 with a P- value of 0.330 which is insignificant at 10% shows that economic sustainability reporting has a positive and insignificant influence on firm value of listed manufacturing companies in Nigeria. This shows that for every one unit increase in ECO there will be no increase in Firm value of listed manufacturing companies in Nigeria. This serves as evidence for accepting the null hypothesis which states that economic sustainability reporting has no significant effect on firm value of listed manufacturing companies in Nigeria. This result contradicts the assertion of Yusoff and Adamu (2016) and Ellili and Nobanee (2022) while supporting the assertion of Utami (2015).

Hypothesis Two (Social sustainability reporting and firm value)

According to the findings from Table 6, SOC with a negative coefficient value of -0.3265 with a P- Value of 0.039 which is significant at 5% shows that social sustainability reporting has a negative and significant influence on firm value of listed manufacturing companies in Nigeria. This shows that for every one unit increase in SOC there will be a significant decrease in the firm value of listed manufacturing companies in Nigeria. Therefore, the Null hypothesis is reject and the alternate is accepted. This tallies with the findings of Wahyuandari et al. (2022) and is in opposition to the findings of Zahirul Islam (2012) and Palmer (2012)

Hypothesis Three (Information asymmetry and firm value)

Based on the results in Table 6, IA with a negative coefficient value of -0.4999 and a P- value of 0.001 which is significant at 1% shows that information asymmetry has a negative and significant influence on firm value of listed manufacturing companies in Nigeria. Thus, showing that for every 1unit increase in information asymmetry there will be a significant decrease in the firm value of listed manufacturing companies in Nigeria. Therefore, the Null hypothesis is rejected, and the alternate is accepted. This finding conforms with the assertion of Huynh et al. (2020) .

Hypothesis four (Information asymmetry Moderating the effect of economic sustainability reporting on firm value)

The outcome in Table 6 shows that Economic sustainability reporting has a positive and insignificant P-value of 0.499 with a coefficient value of 0.6620 when moderated with Information asymmetry. This infers that any unit increase in economic sustainability reporting will lead to no significant increase in firm value of listed manufacturing companies in Nigeria when moderated by Information asymmetry. This shows that

Information asymmetry has a positive and insignificant effect on the effect of economic sustainability on firm value of listed manufacturing firms. Therefore, the Null hypothesis is accepted.

Hypothesis five (Information asymmetry Moderating the effect of social sustainability reporting on firm value)

Table 6 revealed that social sustainability reporting has a positive and 10% significant P-value of 0.055 and with a corresponding coefficient of 1.0812. It therefore concludes that any change in social sustainability reporting will lead to an increase in firm value in listed manufacturing firms in Nigeria when moderated by information asymmetry by more than 100%. Therefore, the study rejects the null hypothesis and accepts the alternate.

Conclusion

The main objective of this study is to investigate the effect of economic and social sustainability reporting on the firm value of listed manufacturing companies in Nigeria, considering information asymmetry as a moderating variable over the period 2007 to 2022. The outcomes from the multiple regression analysis indicate that information asymmetry exhibits a positive and significant effect on the relationship between social sustainability reporting and firm value among listed manufacturing companies in Nigeria. Conversely, information asymmetry demonstrates a positive but insignificant effect on the relationship between economic sustainability reporting and firm value in the same context.

Recommendation

From the foregoing, the following recommendations have been made in order to enhance the firm value of manufacturing companies in Nigeria. Firstly, there is a clear imperative to enhance social sustainability reporting practices. Given the significant positive effect of information asymmetry on the relationship between social sustainability reporting and firm value, companies should prioritize and improve their disclosures in this domain. This involves providing comprehensive and transparent information about their social sustainability initiatives, including community engagement, labor practices, and diversity policies. By doing so, companies can mitigate the impact of information asymmetry and bolster stakeholder confidence, ultimately enhancing firm value.

Secondly, while the effect of information asymmetry on the relationship between economic sustainability reporting and firm value was found to be positive but insignificant, it is still crucial for companies to focus on improving their reporting practices in this area. This entails providing accurate and timely disclosures related to financial performance, resource management, and economic impact. By enhancing economic sustainability reporting, companies can better align their business practices with sustainability goals and demonstrate their commitment to long-term value creation. Additionally, companies should implement measures to mitigate information asymmetry. This could involve improving communication channels with stakeholders, enhancing transparency in reporting practices, and leveraging technology to disseminate information more effectively. By reducing information asymmetry, companies can foster trust, enhance credibility, and ultimately improve firm value. Lastly, continuous monitoring and evaluation of sustainability reporting practices are essential. Regular reviews and assessments can help companies identify areas for improvement, refine reporting strategies, and adapt to evolving stakeholder expectations. By adopting a proactive approach to sustainability reporting, companies can maximize the benefits of transparency and accountability, ultimately enhancing firm value over time.

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APPENDIX

S/N	Name of company	Classification on NGX webiste	Year of Listing
1	Conoil PLC	Oil and Gas	1970
2	Eterna PLC	Oil and Gas	1970
3	Beta Glass PLC	Industrial Goods	1986
4	Austin laz and company PLC	Industrial Goods	1970
5	Cutix PLC	Industrial Goods	1987
6	Dangote cement PLC	Industrial Goods	2010
7	Greif Nigeria PLC	Industrial Goods	1970
8	Lafarge Africa PLC	Industrial Goods	1979
9	Berger paints PLC	Industrial Goods	1970
10	Cap Plc	Industrial Goods	1978
11	Fidson Healthcare PLC	Health care	2008
12	May and Baker Nigeria PLC	Health care	1994
13	Morison Industries PLC	Health care	1970
14	Pharma-Deko PLC	Health care	1970
15	CADBURY NIGERIA PLC.	Consumer Goods	1970
16	DANGOTE SUGAR REFINERY PLC [CG+]	Consumer Goods	2007
17	GUINNESS NIG PLC [CG+]	Consumer Goods	1965
18	HONEYWELL FLOUR MILL PLC [CG+]	Consumer Goods	2009
19	INTERNATIONAL BREWERIES PLC. [BMF]	Consumer Goods	1970
20	NESTLE NIGERIA PLC. [CG+]	Consumer Goods	1970
21	NIGERIAN BREW.	Consumer Goods	1973

	PLC. [CG+]		
22	FLOUR MILLS NIG. PLC. [CG+]	Consumer Goods	1970
23	P Z CUSSONS NIGERIA PLC. [CG+]	Consumer Goods	1970
24	UNILEVER NIGERIA PLC. [CG+]	Consumer Goods	1973
25	VITAFOAM NIG PLC.	Consumer Goods	1970
26	Chellarams PLC	Conglomerates	1977
27	FTN COCOA PROCESSORS PLC [RST]	Agriculture	1970
28	LIVESTOCK FEEDS PLC.	Agriculture	1978
29	PRESCO PLC	Agriculture	2002