

## FIRM-LEVEL CHARACTERISTICS AND ESG DISCLOSURE IN AN EMERGING MARKET

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### ABSTRACT

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**Aim:** This research evaluated firm-level characteristics, specifically free cash flow capacity, intellectual capital, and innovation and their effects on ESG disclosure (combined score) of quoted non-financial firms in Nigeria.

**Background:** In recent years, there has been a growing focus on corporate sustainability from investors, companies, and customers. The absence of substantial evidence regarding drivers of ESG reporting in emerging financial markets presents an opportunity to explore how firm-level characteristics influence strategic decisions including the disclosure of ESG practices.

**Methodology:** This study used an ex-post facto longitudinal design. Analysing 39 listed non-financial firms selected through criterion sampling, with data from 2012 to 2021 obtained their annual reports and accounts. The results were analysed using descriptive and inferential statistics, specifically panel data regression. Tests such as redundant fixed tests and hausman test were conducted within the study.

**Findings:** The findings suggest that these characteristics jointly have an influence on ESG disclosure. Notably, intellectual capital showed a significant, though negative, effect on ESG disclosure. Free cash flow capacity and innovation did not significantly influence ESG disclosure, although free cash flow capacity did exhibit a positive effect. It was concluded that firm-level characteristics are significant factors influencing ESG disclosure.

**Contribution:** This research adds to the current body of literature by adopting a different approach compared to earlier empirical studies in Nigeria. It is among the limited studies conducted on the determinants of ESG disclosure within Nigeria, encompassing a broad range of companies in the non-financial sector.

#### Recommendations

**Researchers:** This study recommends integrating quantitative analysis with qualitative research methods, such as interviews and case studies. This approach can provide a more comprehensive understanding of the motivations, challenges, and best practices related to ESG disclosures.

**Practitioners:** Practitioners are encouraged to explore how different firm characteristics impact ESG disclosure practices. Gaining insights into these relationships can enhance the relevance and quality of ESG reporting.

**Regulators:** It is recommended that regulators persist in promoting sustainable development practices and ensuring companies adhere to established guidelines. Continuous monitoring of these firms is essential.

**Implications for Africa:** African countries with well-developed regulatory frameworks typically have better ESG disclosure. Consequently, it is crucial to implement robust regulatory frameworks to improve ESG disclosures in Nigeria and Africa at large.

**Keywords:** firm-level characteristics, free cash flow capacity, intellectual capital, innovation, environmental, social and governance disclosure



## 1. Introduction

Public pressure in recent years has prompted companies globally to adopt socially responsible actions and align their operations with social values (Di Simone et al., 2022; Sabiya et al., 2024). There is a growing public demand for companies to uphold a positive corporate social responsibility (CSR) image and ensure increased transparency regarding environmental, social, and governance (ESG) issues, as these topics are highly significant to interested parties. Investors are demanding ESG-related disclosures, prompting firms to incorporate these disclosures as a key part of their core mandates (Hammami & Zadeh, 2020; Helfaya et al., 2023). Companies are starting to realize that achieving their future goals is unlikely without focusing on sustainability strategies and disclosing information related to ESG issues (Alsayegh et al., 2020).

The emphasis on ESG was enhanced by the Principles for Responsible Investment (PRI) initiative in 2006 (PRI, 2016; PRI, 2021), formally established by the United Nations Global Compact (UNGC) and the United Nations Environment Program (UNEP). Since then, numerous investors have endorsed the UN's Principles of Responsible Investment, reflecting the rising number of shareholder proposals containing ESG resolutions (PRI, 2021). Institutional investors and also individual investors now consider ESG disclosure by firms to be essential, as it highlights the risks and opportunities faced by these firms (Helfaya et al., 2023). Securities issuers have a legal obligation to provide thorough, timely, and precise information about a company's environmental, social, governance, and financial management practices when it comes to ESG information disclosure. This is crucial for enabling the market to make well-informed evaluations of investment value and safeguarding the lawful rights of creditors or shareholders (Zhao et al., 2018). The Nigerian Stock Exchange Sustainability Disclosure Guidelines (2019/2018) use the term "Sustainability," commonly employed by companies, while "ESG" is often used interchangeably by investors. The guidelines clarify that both terms encompass a comprehensive set of economic, environmental, social, and governance considerations that can impact a company's ability to execute its business strategy and create or destroy value.

Several frameworks have been developed to support ESG reporting. The Global Reporting Initiative (GRI), launched its Sustainability Reporting Standards in 2016, following its fourth version started in 2013 (Bose, 2020). The global standard continues to be the GRI, and serves as a guidance document on disclosure of sustainability issues through ESG (Threlfall et al., 2020). The International Integrated Reporting Council (IIRC) developed the Integrated Reporting Framework to improve the quality of information accessible to investors, with the goal of optimizing capital allocation. Jean Rogers established the Sustainability Accounting Standards Board (SASB) in 2011 in the United States (The International Integrated Reporting Council, 2013). Jean Rogers established the Sustainability Accounting Standards Board (SASB) in 2011 in the United States and it focuses on setting disclosure standards on sustainability issues to facilitate effective communication between companies and their investors for informed decision-making (Rogers, 2024). In Nigeria, various principles, frameworks, and legislations



have also emerged. The Constitution of the Federal Republic of Nigeria, 1999 (as amended), serves as the foundation for ESG-related regulations (Adu et al., 2022). The Nigerian Exchange Group (formerly known as the Nigerian Stock Exchange), with approval from the SEC, issued the Sustainability Disclosure Guidelines for publicly listed companies. These guidelines cover essential ESG principles and outline recommended reporting requirements for listed companies concerning their ESG performance (Nigerian Stock Exchange, 2021).

Research conducted previously suggests that there continues to be a low level of ESG disclosure in developing markets (Haider, 2010). In Nigeria, certain companies are now disclosing their ESG practices. While some are disclosing, the level of disclosure among others is quite low or close to non-existent. Several stakeholders in Nigeria have yet to prioritize ESG-related issues, presenting a challenge for ESG reporting in the country (Iheanyi, 2022). According to Asaolu et al. (2011), multinational corporations in the oil and gas sector have frequently faced allegations of being non-transparent, disregarding stakeholder concerns, causing environmental harm, and being the focus of community unrest and widespread public criticism. While Nigeria does not mandate public companies to engage in ESG related reporting, there have been significant efforts, such as the sustainability disclosure guidelines introduced by the Nigerian Stock Exchange (NSE) in 2016 and many others earlier mentioned. The voluntary disclosure of ESG related information has numerous benefits. This practice reduces information asymmetry and enhances transparency regarding corporate sustainability efforts. Investors are able to easily evaluate and guide their investments towards companies making positive impacts due to greater transparency (Girón et al., 2020).

Prior findings indicate that firm-level characteristics can explain variations in ESG related disclosure (Adelowotan & Udofia, 2021; Di Simone et al., 2022; Khalid et al., 2022; Nuskiya et al., 2021; Sharma et al., 2020). However, the impact of firm-level characteristics and corporate on ESG disclosure can be influenced by differences in institutions and environments. Haider (2010) further highlights that various factors including political, social, and economic conditions unique to developing countries significantly impact ESG related disclosure. Despite this, though studies exist in other jurisdictions on the effect of firm-level characteristics (particularly, free cash flow capacity, intellectual capital and innovation) on ESG related disclosure, it still hasn't covered a huge gap and yielded varied results (Alinda et al., 2024; Bananuka et al., 2023; Dicuonzo et al., 2022; Karaman et al., 2018; Kumar et al., 2021; Orazalin & Mahmood, 2020). In Nigeria, it is close to non-existent a vast number of previous studies focused more on other firm-level attributes that includes firm size, profitability, liquidity, cost of capital, firm age, leverage and their effect on one or more of the indicators of ESG disclosure (Adelowotan & Udofia, 2021; Lambe et al., 2023; Ndalun et al., 2021; Okoye & Okerekeoti, 2021; Razaq et al., 2023). Declining cash flows represent a major threat to businesses in Nigeria. According to Ashinze (2022), net cash flows from operations of leading firms across various industries in Africa's largest economy are under pressure which may affect ESG disclosure level. A firm's intellectual capital is widely



acknowledged as a driver of competitive advantage and firm value, particularly through activities like the disclosure of ESG-related information (John-Akamelu & Iyidiobi, 2018). Similarly, poor innovation-driven outcomes in the energy, manufacturing, and other productive sectors of the economy is a systemic challenge (Moghalu, 2022), which can hinder companies' ability to innovate in their production processes, leading to inadequate disclosure on ESG-related matters.

Based on the identified gaps above, the influence of firm-level characteristics on ESG disclosure of quoted non-financial firms in Nigeria was investigated in this study. Specifically, this study assessed the effect of Free Cash Flow Capacity, Intellectual capital and Innovation on ESG disclosure of listed non-financial firms in Nigeria.

## 2. Literature review and hypotheses development

### 2.1 Theoretical review

Three theories are discussed in this study considering their relevance. However, this research work is underpinned on two key theories i.e. stakeholder theory (as it addresses all stakeholders providing a broad view of them) and resource based theory (considering the valuable resources existing within the organisation). *Stakeholder theory*, introduced by Freeman (1984), has been an influential concept in strategic management literature, emphasizing the importance of considering the interests of all legitimate stakeholders, not just shareholders. Stakeholder theorists believe that an organization should work towards achieving the diverse objectives of a wide range of stakeholders. This theory is pertinent to the current study as it emphasizes the significance of addressing the interests of all legitimate stakeholders.

*Signaling theory* is also pertinent to this study as it explains that firms may increase ESG disclosures to signal their commitment to corporate citizenship. Companies with better financial capabilities, such as higher free cash flow, can afford the costs associated with providing high-quality ESG or sustainability reports, thereby meeting stakeholder needs and acting as a signaling tool (Orazalin & Mahmood, 2018). Spence (1973) put forward this theory to tackle the issue of information asymmetry in the labor market. According to the signal theory, when a person in possession of more information makes it available through voluntary disclosure to external interested parties, the gap between the users of information can be minimised if the person in possession of a larger amount of information makes it available (Morris, 1987).

Additionally, *Resource-based theory*, first introduced by Wernerfelt (1984), is a widely cited framework in strategic management due to its practical relevance to modern management practices. Barney's seminal 1991 paper, "Firm Resources and Sustained Competitive Advantage," is frequently cited as a crucial milestone in the advancement of the resource-based perspective (Barney, 1991). This view operates on the assumption that firms are heterogeneous and possess unique strategic resources (Lavie, 2006). These strategic resources, which constitute the firm's internal capabilities, are considered the



primary source of sustained competitive advantage if they meet the VRIN criteria: Valuable, Rare, Imperfectly imitable, and Non-substitutable. Resource-based theory is pertinent as it underscores the significance of both tangible and intangible resources and capabilities of a company in attaining lasting competitive advantage (Barney, 1991). From this standpoint, innovation and intellectual capital are viewed as valuable and unique internal capabilities that allow a firm to pursue a sustainable change path, which includes ESG practices and disclosures. The theoretical foundation provided by the resource-based view helps in understanding firm-level attributes like intellectual capital and innovation.

## 2.2 Hypotheses development

### 2.2.1 Free cash flow and ESG disclosure

Komal et al. (2022) described Free Cash Flow (FCF) as essential to a company's performance throughout the year, as it is used in assessing a company's financial well-being and performance. When managed effectively, FCF can significantly contribute to the company's growth and profitability. Jensen (1989) defined FCF as the net cash flow from operating activities after deducting capital expenditures, dividend payments, and inventory costs. Furthermore, Jensen (1989) described it as the surplus cash flow available to finance all projects with positive net present values, discounted at their respective cost of capital. Dechow and Weili (2006), FCF comprises operational cash flow and cash flow from financial investments. Essentially, it represents the resources firms can use for investments or distribute to shareholders. Orazalin and Mahmood (2020) stated that free cash flows indicate a company's financial capability, allowing it to handle the internal expenses of typical ESG disclosures to fulfil the demands and requirements of stakeholders, thus serving as a signaling tool.

Some studies have looked into the connection between ESG related disclosure and free cash flow capacity. Orazalin and Mahmood (2020) conducted research using data from 2013 to 2015, and their findings offered empirical evidence on how free cash flow capacity influences the quality and extent of sustainability information provided by listed companies in Kazakhstan. The findings showed that the ability to generate free cash flow does not have a significant impact on the changes in sustainability performance ratings. Likewise, Karaman et al. (2018) provided worldwide proof regarding the effect of free cash flow per share on GRI-based sustainability disclosure (economic, social, and environmental) in the aviation industry and its association with firm performance. Financial information data was obtained from the Thomas Reuters database and GRI reports from the GRI Sustainability Disclosure Database over the period 2006-2015. The results indicated that sustainability reporting was not significantly impacted by free cash flow per share. Jagadish and Sharmila (2021) analysed how free cash flow affected the financial performance of commercial banks in Pakistan from 2011 to 2020 and found a noteworthy positive influence on net worth, but a notable negative effect on profitability. Razaq et al. (2023) analyzed the financial stability of companies in the non-financial sector in Nigeria by focusing on liquidity and



its impact on sustainability reporting for listed firms. The findings indicated that liquidity had a significant and favourable influence. Similarly, Sabiya et al. (2024) in their research on oil and gas companies listed on the Nigerian Exchange group, found that liquidity has a comparable impact on the quality of sustainability reporting. The following is thus hypothesised:

*H<sub>01</sub>: Free Cash Flow Capacity does not significantly influence ESG disclosure of listed non-financial firms in Nigeria.*

### 2.2.2 Intellectual capital and ESG disclosure

The concept of Intellectual Capital (IC) is seen as a body of knowledge that offers external parties valuable, pertinent information regarding a company's ability to endure in the long term (Farooq & Nielsen, 2014). The Organisation for Economic Cooperation and Development (OECD) defines intellectual capital to encompass investments in training employees, managing customer relations, conducting research and development, and implementing computer and administrative systems (OECD, 2008). Intellectual capital was conceptualized as the Value Added Intellectual Capital (VAIC) method, introduced by Pulic (1998). Ante Pulic was among the pioneers in intellectual capital research who based his analysis solely on financial statement figures. The VAIC model assigns specific economic values to value added, capital employed (CE), human capital (HC), Structural Capital (SC) relational capital (RC), human capital (HC), and structural capital (SC), resulting in a clear VAIC index. This model aims to measure the extent to which companies generate added value through their intellectual resources or the efficiency of their intellectual capital. Pulic (2004, 2005) adapted two components of intellectual capital—human and structural capital—into financial metrics. Companies possessing internal resources, particularly employees with knowledge in sustainability reporting, are more likely to be inclined to prepare sustainability reports compared to those lacking such knowledge (Tauringana, 2021b).

Based on the foregoing, some studies have emerged on intellectual capital (IC) and ESG related disclosure, though the direct link between intellectual capital and ESG disclosure is limited. Alinda et al. (2024) assessed the interaction between the dimensions of IC and sustainability practices of medium and large manufacturing firms in Uganda using a survey approach (questionnaire). The results from the study explained that the three dimensions of Intellectual capital (structural, human and relational) significantly and positively influence sustainability practices (social, economic and environmental). Additionally, In Uganda, Bananuka et al. (2023) conducted a study on how intellectual capital (IC) affects sustainability reporting practices, with a specific focus on human, relational and structural capital's roles. Data collected through a questionnaire and analyzed with multiple regression analysis indicated a significant effect of IC on sustainability reporting practices. Additionally, Bananuka et al. (2022) examined the impact of intellectual capital on compliance with GRI sustainability reporting standards in Ugandan manufacturing firms, finding a significant and positive effect on sustainability performance. Reboredo and Sowaity



(2022) studied the relationship between the elements of intellectual capital efficiency and ESG information disclosure in Jordanian listed firms from 2009 to 2018, revealing mixed interactions between the components of intellectual capital efficiency (human, relational and structural capital) and ESG information (environmental, social, and governance). In a study by Tauringana (2021a), the impact of human capital characteristics on the implementation of sustainability reporting in Uganda was examined. It was concluded that the absence of these attributes negatively affected the adoption of sustainability reporting. Chouaibi and Chouaibi (2020) investigated how Corporate Social Responsibility (CSR) moderates the connection between Value Added Intellectual Capital (VAIC) and voluntary IC disclosure, finding that CSR significantly influences this relationship. It is therefore hypothesised that:

*H<sub>02</sub>: Intellectual Capital does not have a significant effect on ESG disclosure of listed non-financial firms in Nigeria.*

### 2.2.3 Innovation and ESG disclosure

The tendency of companies to focus on innovation usually indicates their forward-looking approach (Barbieri et al., 2018). Dicuonzo et al. (2022) emphasized that achieving corporate and ESG sustainability goals are best accomplished through innovation. It involves the implementation of new ideas in a firm's products, processes, or any other aspect of its operations. This encompasses the commercialization or extraction of value from ideas (Rogers, 1998). According to the Department of Industry Science and Technology (DIST, 1996), innovation is broadly defined as the implementation of fresh ideas within a firm, whether incorporated into processes, products, services, and work organisation, marketing, or management systems. Di Simone et al. (2022) describe innovation as a complex concept that is notoriously challenging to quantify. Rogers (1998) suggested that measures of innovation can include the number of product innovations, the perceived value of the innovation, R&D expenditures, patents, designs, trademarks, and new technologies, among other quantitative metrics. While each of these measures has some validity, none can serve as a standalone measure of innovation; they should instead be considered indicators. Companies frequently utilize innovation to facilitate lasting changes, encompassing aspects such as earnings management, corporate social responsibility, transparency and accountability through the integration of ESG dimensions, as noted by Lombardi and Secundo (2020).

Studies such as Di Simone et al. (2022) empirically investigated the interaction that exist between innovation as perceived by the market and economic sustainability, and the effect of economic sustainability on ESG issues in the most innovative companies globally from 2013-2017. The results showed that innovation positively influenced economic sustainability, which in turn positively affected ESG issues, albeit with varying impacts. Xu et al. (2022) carried out a study examining how green innovation affects the ESG performance of publicly listed firms in China from 2017 to 2019. The findings revealed that green innovation, as evidenced by patent outcomes, significantly



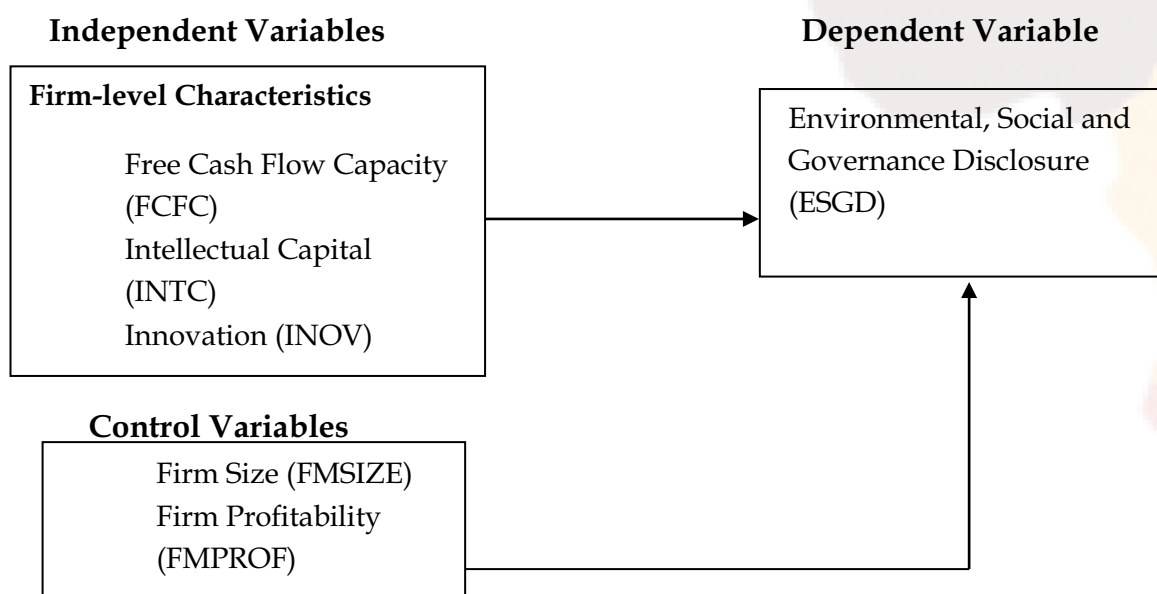
enhanced the ESG performance of these Chinese firms. Similarly, Zheng et al. (2022) analyzed the green innovation practices of firms listed on the Growth Enterprise Market (GEM) from 2014 to 2019 and their effects on ESG ratings and financial performance. The findings showed that ESG scores are significantly enhanced by green innovation, and that the financial performance of GEM-listed companies is positively impacted by both green innovation and high ESG scores. Dicuonzo et al. (2022) also identified that innovation has a considerable positive impact on ESG practices within 1,787 industrial firms in Italy, Spain, Germany, the UK, and the USA. This indicates that allocating resources to research and development and patent creation fosters sustainable industry. On the other hand, Marsat and Williams (2014); Mithani (2017) identified a negative influence of innovation on sustainability. The hypothesis below is therefore tested:

*H<sub>03</sub>: Innovation has no significant effect on ESG disclosure of listed non-financial firms in Nigeria.*

### 2.3 Conceptual framework

Figure 1 explains the relationships that exist among the variables considered for this study, expressed diagrammatically.

**Figure 1: Conceptual framework on firm-level characteristics and ESG disclosure**



Source: Authors' Conceptualisation (2024)

### 3. Data and methodology

An *ex-post facto* longitudinal research design was employed to investigate how firm-level characteristics affect Environmental, Social, and Governance (ESG) Disclosure, in order to achieve the primary objective. The research focused on all 103 non-financial companies that were publicly traded on the Nigerian Exchange Group (NGX Group) when the data was gathered. Secondary data were obtained from the audited annual





reports and accounts of these firms over a twelve-year period (2011 to 2021). The sample size was chosen using criterion sampling, which meant that firms delisted during the observation period, firms that ceased operations during the study period, and firms lacking sufficient data to proxy the study variables were excluded. Thirty-nine (39) firms were purposively selected using criterion sampling based on data availability during the collection and extraction process. Data for free cash flow, intellectual capital, and innovation were sourced from the firms' annual reports, with measurements derived from previous literature. For the ESG disclosure index, the study considered 38 ESG indicators, comprising 13 environmental metrics, 8 social metrics, and 17 governance metrics.

Descriptive, correlation, and multiple regression analysis were employed in this study to accomplish its objectives. Tests including panel unit root test, panel data model testing (using Lagrange Multiplier tests), redundant fixed test, Hausman test, diagnostic tests (Panel heteroskedasticity LR test and Arellano-Bond Serial correlation tests) were carried out.

### 3.1 Model specification

In order to accomplish the main goal of this research, which is to investigate how firm-level characteristics affect Environmental, Social, and Governance (ESG) Disclosure, the model outlined below is employed:

$$ESGD_{it} = \beta_0 + \beta_1FCFC_{it} + \beta_2INTC_{it} + \beta_3INOV_{it} + \beta_4FMSIZE_{it} + \beta_5FMPROF_{it} + u_{it} \dots\dots\dots(3.1)$$

The *a priori* expectations of the parameters are:  $\beta_1- \beta_5 > 0$

The interpretation for the symbols used in the models tested in this study is stated below:

ESGD = Environmental, Social and Governance Disclosure (ESGD)

FCFC = Free Cash Flow Capacity

INTC = Intellectual Capital

INOV = Innovation

FMSIZE = Firm Size

FMPROF = Firm Profitability

$\beta_0$  = Intercept of the model

$\beta_1-\beta_4$  = Coefficient of parameters under investigation

$u_{it}$  = Error term

The *i* and *t* subscripts indicate the cross-sectional and time series aspects of the model, illustrating the panel structure of the model.

The control variables, Firm Size (FMSIZE) and Firm Profitability (FMPROF) have been included in the model of study. The purpose of this is avoid errors of model specification or omitted variable bias; they have been identified from previous studies (Hammami & Zadeh, 2020; Lambe et al., 2023; Ramirez et al., 2022; Sabiya et al., 2024) as having significant positive influences on ESG disclosure.



The description and measurement of each variables of measure is stated in the Table below:

**Table 1: Description and measurement of variables**

<b>Variables (Code)</b>	<b>Measurement</b>	<b>Sources</b>
<b>Dependent Variables</b>		
ESG Disclosure (ESGD)	The Total score from the adapted ESG disclosure index is determined by dividing the total number of disclosed items divided by the maximum possible disclosures according to the index.	(Ameraldo & Ghazali, 2021; Cucari et al., 2017; Tran et al., 2020)
<b>Independent Variables</b>		
Free Cash Flow Capacity (FCFC)	The ratio is calculated by dividing free cash flow by total assets. Free cash flow is determined by subtracting tax expense, interest expense, and cash dividend from operating cash flows.	(Kumar et al., 2021)  (Profita & Ratnaningsih, 2016)
Intellectual Capital (INTC)	<p>The Value Added Intellectual Capital (VAIC) model measures Intellectual Capital Efficiency. The VAIC is calculated as SCE+HCE+RCE or ICE + RCE.</p> <p><b>Structural Capital (SC)</b> =Value Added less Human Capital i.e. VA-HC</p> <p><b>Human Capital (HC)</b>=Employee Expenses i.e. All costs invested in employees (calculated as:</p> <p><b>Relational Capital/Capital Employed (RC)</b> = Total net tangible assets (Book value)</p> <p>SCE= SC/VA HCE= VA/HC RCE = VA/CE ICE=HCE+SCE</p>	(Shahzad et al., 2022).
Innovation (INOV)	<p>Measured as Intangible Asset/Total Asset multiplied by market to book ratio of the firm</p> <p>Market to book ratio is obtained by dividing market capitalization by total equity</p>	(Di Simone et al., 2022)
<b>Control Variables</b>		
Firm Size (FMSIZE)	The total assets' natural logarithm	(Sharma et al., 2020)
Firm Profitability (FMPROF)	Proportion of Earnings Before Interest & Taxes to Total Assets	(Ramirez et al., 2022)

Source: Authors' Computation (2024)



#### 4. Data analysis and discussion of findings

This section contains the presentation of the analysis results for the impact of firm-level characteristics and ESG disclosure.

##### 4.1 Descriptive statistics

The statistical measures presented in Table 2 provide a summary of important data for both the independent and dependent variables utilized in this research. These measures encompass the average, middle value, highest value, lowest value, standard deviation, and skewness.

**Table 2: Descriptive statistics**

Variable	Mean	Med.	Max.	Min.	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Prob
FCFC	0.42	0.04	141.42	-0.61	6.80	20.46	424.41	3271477.00	0.0000
INTC	4.91	4.19	55.49	-15.81	5.13	2.97	27.63	10914.40	0.0000
INOV	0.06	0.00	2.53	0.00	0.28	6.51	48.39	40891.02	0.0000
FMSIZE	23.83	24.06	27.23	17.32	1.84	-0.30	2.54	10.57	0.0051
FMPROF	0.91	0.08	258.94	-0.30	13.02	18.40	355.89	2318349.00	0.0000

**Source Authors' Computation (2024)**

In Table 2, the mean Free Cash Flow Capacity (FCFC) is approximately 0.42, indicating firms' ability to generate discretionary cash flows relative to their total assets. A substantial standard deviation of 6.80, points to significant variability in FCFC. The skewness value of 20.46 highlights extreme positive skewness, suggesting the presence of outliers. This is further supported by the kurtosis of 424.41, which indicates extremely heavy tails and outliers, as confirmed by the exceptionally low p-value from the Jarque-Bera test ( $p < 0.001$ ).

For Intellectual Capital (INTC), the average score is around 4.91, reflecting the efficiency of firms' structural, human, and relational capital. A standard deviation of 5.13 shows moderate variability in IC. The skewness of 2.97 indicates significant positive skewness, and the high kurtosis of 27.63 points to the presence of heavy tails and potential outliers. The extremely low Jarque-Bera probability ( $p < 0.001$ ) confirms the non-normal distribution. Innovation (INOV) has an average score of approximately 0.06, representing firms' innovative activities as perceived by the market. The skewness of 6.51 signifies significant positive skewness, indicating a concentration of lower scores with a few high outliers. The very high kurtosis of 48.39 supports the presence of heavy tails and significant potential outliers. The Jarque-Bera statistic, with a probability near zero ( $p < 0.001$ ), confirms non-normality.

The average value for Firm Size (FMSIZE) is around 23.83, indicating the size of firms within the dataset. The standard deviation of 1.84 suggests relatively low variability. The skewness of -0.30 shows a slightly left-skewed distribution, and a kurtosis of 2.54 points to moderately heavy tails. The Jarque-Bera test probability of 0.005 indicates significant deviations from normality.



The average index for Firm Profitability (FMPROF) is approximately 0.91, which shows the financial gains in terms of earnings before interest and taxes compared to total assets. The standard deviation of 13.02 indicates substantial variability in profitability. The extreme positive skewness of 18.40 suggests a heavily skewed distribution towards higher values, likely due to outliers. A very high kurtosis of 355.89 confirms the presence of heavy tails and significant outliers. The extremely low probability from the Jarque-Bera test ( $p < 0.001$ ) confirms the non-normal distribution.

Environmental Social and Governance Disclosure (ESGD) has an average score of approximately 59.15, reflecting varying degrees of firms' commitment to ESG practices. The standard deviation of 8.94 indicates the spread of ESG disclosure scores. A skewness of -1.27 suggests a moderately left-skewed distribution, indicating a tendency for higher ESG disclosure values. The elevated kurtosis of 7.90 indicates heavier tails and potential outliers. The significantly low Jarque-Bera p-value ( $p < 0.001$ ) underscores the non-normality of the distribution.

#### 4.2 Correlation analysis

Table 3 presents the pairwise correlation analysis, which displays the connections and degrees of correlation between the explanatory variables and dependent variable.

**Table 3: Correlation results of independent variables**

Probability	ESGD	FCFC	FMPROF	FMSIZE	INTC	INOV
ESGD	1.000					
	-----					
FCFC	-0.020	1.000				
	0.679	-----				
FMPROF	-0.019	0.998	1.000			
	0.692	0.000	-----			
FMSIZE	0.321	-0.180	-0.177	1.000		
	0.000	0.000	0.000	-----		
INTC	0.024	-0.030	-0.025	0.202	1.000	
	0.624	0.540	0.610	0.000	-----	
INOV	0.084	-0.011	-0.007	0.235	0.035	1.000
	0.091	0.818	0.885	0.000	0.474	-----

**Source: Authors' Computation (2024)**

Table 3 indicates that there is a moderate positive correlation (0.321) between Environmental Social and Governance Disclosure (ESGD) and Firm Size (FMSIZE), indicating that larger companies may have greater ESG disclosures. The low probability values indicate these correlations are significant. There is a weak negative correlation with Free Cash Flow Capacity (FCFC) (-0.020), indicating a minimal association.

Free Cash Flow Capacity (FCFC) exhibits weak negative correlations with Firm Profitability (FMPROF) (-0.019) and Firm Size (FMSIZE) (-0.180), with probability values generally indicating insignificant correlations. Also, Firm Profitability (FMPROF) shows a nearly perfect positive correlation (0.998) with FCFC, suggesting potential



multicollinearity issues. Correlations with other variables are notably weak. Likewise, Intellectual Capital (INTC) has a moderately strong positive correlation with Innovation (INOV) (0.035), indicating a possible relationship between intellectual capital and innovation. INTC also shows weak positive correlations with Firm Size (FMSIZE) (0.067), while correlations with other variables are generally weak. Additionally, Innovation (INOV) displays a weak positive correlation with Intellectual Capital (INTC) (0.036). The correlation with ESGD (0.084) is also weak, indicating limited association. Other correlations are relatively weak.

### 4.3 Panel unit root test

Table 4 presents the panel unit root test results

**Table 4: Panel unit root test**

	Levin, Lin & Chu t*		Im, Pesaran and Shin W-stat		Remarks
	Test statistics	p-value	Test statistics	p-value	
FCFC	-13.9719	0.0000	-10.2446	0.0000	Stationary
INTC	-8.08715	0.0000	-5.29328	0.0000	Stationary
INOV	-18.8262	0.0000	-16.7612	0.0000	Stationary
FMPROF	-7.65703	0.0000	-4.04952	0.0000	Stationary
FMSIZE	-4.34267	0.0000	0.99051	0.0000	Stationary
ESGD	-13.8832	0.0000	-4.68199	0.0000	Stationary

**Source: Authors' Computation (2024)**

In this study, the panel data was subjected to a panel unit root test to establish its stationarity. It is essential to conduct this test to ensure that the parameters are stationary and to prevent obtaining misleading regression results. The test results indicate that all variables are stationary. For Free Cash Flow Capacity (FCFC), the negative test statistics and p-values of 0.0000 from both tests suggest stationarity, as they demonstrate the rejection of a unit root presence. Similarly, for Intellectual Capital (INTC), the negative test statistics and p-values of 0.0000 indicate that the IC series is stationary. Innovation (INOV) also exhibits stationarity, with highly negative statistics and p-values of 0.0000.

Similarly, for Firm Size (FMSIZE), the test results indicate the rejection of unit roots in the FMSIZE series, as evidenced by the negative test statistics and p-values of 0.0000. Similarly, Firm Profitability (FMPROF) shows characteristics of stationarity, with negative test statistics and p-values of 0.0000 from both tests. For Environmental Social and Governance Disclosure (ESGD), the negative test statistics and low p-values (0.0000) from both tests strongly suggest that the ESGD series is not non-stationary.

### 4.4 Effect of firm-level characteristics on ESG disclosure

This section presents the results of the effect firm-level characteristics have on ESG disclosure



#### 4.4.1 Model specification test

Table 5 provides the specifications and tests of panel data models for various dependent variables, including the Lagrange Multiplier (LM) tests, redundant fixed effects tests, and the Hausman test.

**Table 5: Specification test**

ESGD Model	Test statistics	P-value
Lagrange Multiplier Tests	229.6344	0.0000
Redundant Fixed Effects Tests	217.726	0.0000
Hausman Test	29.517	0.0000

*Source: Authors' Computation (2024)*

**Lagrange Multiplier tests:** The LM test statistic of 229.6344 yields a p-value of 0.0000, indicating that the ESGD model rejects the pooled OLS; **Redundant Fixed Effects test:** The test statistic is 217.726 for redundant fixed effects, and the p-value is 0.0000, suggesting that certain fixed effects in the model are essential; **Hausman test:** The test statistic of 29.517 indicates a p-value of 0.0000, which implies that the fixed effects model is more suitable than the random effects model. As a result, the study's findings were presented and analyzed using the fixed effects model.

#### 4.4.2 Model diagnostic test

The Panel Heteroskedasticity LR test and the Arellano-Bond Serial Correlation test of the model residuals were carried out and detailed in Table 6 for all dependent variables utilized to meet the study's objectives.

**Table 6: Diagnostic test**

ESGD Model	Test statistics	P-value
Panel Heteroskedasticity LR Test	25.96476	0.9129
Arellano-Bond Serial Correlation Test	-1.339932	0.1803

*Source: Authors' Computation (2024)*

**Panel Heteroskedasticity LR test:** The test statistic for the ESGD model is 25.96476, and it has a p-value of 0.9129, suggesting that there is no significant evidence of heteroskedasticity.

**Arellano-Bond serial correlation test:** The test statistic is -1.339932, with a p-value of 0.1803, suggesting no significant evidence of serial correlation in the ESGD model.

#### 4.4.3 Regression estimate and interpretation

Table 7 presents the results examining the effect firm-level characteristics have on ESG disclosure.



**Table 7: Regression Estimate**

<i>Eq Name:</i>	ESGD Model
<i>Method:</i>	LS
<i>Dep. Var:</i>	ESGD
FCFC	0.4360 [0.5427] (0.5992)
INTC	-0.0959 [-1.9270]* (0.0828)
INOV	-0.4544 [-0.5712] (0.5805)
FMSIZE	2.1124 [2.7547]** (0.0203)
FMPROF	-0.5295 [-0.4290] (0.6770)
C	9.6642 [0.4813] (0.6406)
<i>R-squared:</i>	0.0560
<i>F-statistic:</i>	4.6957
<i>Prob(F-stat):</i>	0.0004

*t-value in bracket [greater than 2 in absolute value = sig] and p-value (in bracket), \*\* sig. at 1%, \*sig. at 5%,*

**Source: Authors' Computation (2024)**

The coefficient for Free Cash Flow Capacity (FCFC) is 0.4360 but not statistically significant (t-value: 0.5427), implying that changes in FCFC do not significantly impact ESGD. For Intellectual Capital (INTC), the coefficient is -0.0959 and statistically significant (t-value: -1.9270), indicating that a decrease in IC is associated with a slight increase in ESGD. The coefficient for Innovation (INOV) is -0.4544 but not statistically significant (t-value: -0.5712), suggesting that innovation does not significantly impact ESGD. Also, the coefficient for Firm Size (FMSIZE) is 2.1124 and statistically significant (t-value: 2.7547), indicating that firms that are larger tend to have higher ESGD scores. For Firm Profitability (FMPROF), the coefficient is -0.5295 but not statistically significant (t-value: -0.4290), suggesting that firm profitability does not significantly impact ESGD, hence failure to reject the null hypothesis. The overall model explains a small portion of the variance in ESGD (R-squared: 0.0560), and the F-statistic (4.6957) indicates that at least some predictors jointly influence ESGD. However, individual variable impacts are mixed, with only Firm Size showing significant influence.

#### 4.5 Results and findings

Table 4.6 provides a detailed analysis of the regression estimates and looks at how firm-level variables affect the ESG disclosure of listed companies in Nigeria's non-financial



sector. Based on hypothesis one, the study's findings suggest that firm-level characteristics significantly influence ESG disclosure, although the significance of individual variables is mixed. Hence, the null hypothesis was not accepted. This is consistent with the results obtained by Khalid et al. (2022) and Maama (2021). Specifically, Free Cash Flow Capacity had a positive but insignificant influence on ESG disclosure, the positive influence is in line with Kumar et al. (2021), implying that firms with higher financial capabilities engage more in ESG practices to fulfil stakeholder needs. This supports the theoretical framework of stakeholder theory utilized in this study. However, the insignificant effect aligns with findings of Artiach et al. (2010). The positive findings from this results are in line with the accrual principle because it ensures that the liabilities and costs relating to environmental and social issues are recognised not only when transactions related to cash occurs. This provides a better reflection of the organisation's financial health and its free cash flow. The insignificant effect has relevance with the principle of materiality because even though Free Cash Flow Capacity has minimal positive influence, stakeholders consider it relevant and requires disclosure.

Regarding the second hypothesis, ESG disclosure was significantly but negatively impacted by Intellectual Capital. Previous research has found a limited direct effect of Intellectual Capital. This study thus failed to accept the null hypothesis. Contrary to the theoretical assumption that intellectual capital, being a strategic and valuable resource, enhances ESG disclosure, this result contradicts the resource-based theory. The negative result is also relevant to the materiality principle requiring that all significant matters that could affect the decisions of stakeholders must be reported. For example, it is possible that there could be loss of major employees or declining corporate relationships which could have had significant ESG implications demanding disclosure.

In the case of hypothesis three, Innovation does not significantly impact ESG disclosure, suggesting that reduced innovative efforts do not markedly affect ESG disclosure. As a result, the null hypothesis was accepted. This is inconsistent with the findings of Dicuonzo et al. (2022) and Kluza et al. (2021). The reduced and insignificant result for innovation is also linked to the materiality principle. Its effects in the form of decreased efficiency in relation to environmental issues and impacts socially require disclosure considering its significance to stakeholders. The control variables, Firm Size revealed a significant positive influence consistent with (Chung et al., 2024; Zheng, 2024), while Firm Profitability showed an insignificant influence, aligning with the findings of Karaman et al. (2018).

## 5. Conclusion and recommendations

This research reached significant conclusions regarding the firm-level characteristics affecting ESG disclosure across quoted non-financial companies in Nigeria. The results from hypotheses one to three demonstrated that firm-level characteristics have an effect on ESG disclosure. Specifically, intellectual capital significantly impacted ESG disclosure, though the influence was negative. Free cash flow capacity and innovation





had an insignificant influence on ESG disclosure, with free cash flow capacity showing a positive effect and innovation a negative one.

Considering the contributions and critical discussions of this study, it is recommended that management of the firm, relevant authorities and policy makers consider firm-level characteristics as they significantly influence ESG disclosure. Specifically, firms should analyse how minor positive influences of free cash flow capacity affect ESG factors, for example in areas of funding for ESG related projects, initiatives and practices. Furthermore, firms need to identify the key aspects of Intellectual capital and Innovation that are considered most vital to their ESG performance and how their decline impact ESG disclosure.

### **5.1 Contributions to knowledge**

A notable contribution of this research is its comprehensive examination of a broad spectrum of firms within the non-financial sector. Unlike previous studies in Nigeria, which typically focused on only one or two sectors, primarily manufacturing and oil and gas, this research offers a broader scope. Consequently, it makes a significant addition to the current body of literature and offers a strong basis for generalisation. Moreover, there has been limited research on firm-level characteristics and ESG disclosure of companies in Nigeria. This study stands out as one of the few addressing these areas. Its findings provide something distinctive and worthwhile to the body of knowledge from both the Nigerian and global perspectives.

### **5.2 Limitations**

This research concentrates on non-financial firms quoted in Nigeria, thus limiting generalisation. Additionally, it relies on secondary data, which may not capture numerous reasons behind the motivations for ESG disclosure.

### **5.3 Suggestion for further studies**

Future research could explore the how various firm-level characteristics is affected by ESG disclosure (individual scores) and the results compared with the combined score so as to ascertain the changes in result. Additionally, using mixed methods, including qualitative studies such as interviews with executives of company could yield more insightful information on the driving forces behind ESG practices and disclosure.



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