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MAGAJI ABBA

Faculty of Management Sciences, A.T.B.U. Bauchi, Nigeria

MUHAMMAD AUWAL KABIR

Faculty of Social and Management Sciences, Bauchi State University, Gadau, Nigeria

ABDULKADIR ABUBAKAR

Faculty of Social and Management Sciences, Bauchi State University, Gadau, Nigeria

ENVIRONMENTAL DISCLOSURES EFFECT ON COST OF CAPITAL STRUCTURE FINANCING OF THE NIGERIAN LISTED COMPANIES

Abstract:

The paper examined the relationship between environmental disclosure and cost of capital structure financing of the Nigerian listed companies. This is due to a concern about the environmental behaviour of the companies that result in stakeholders' interest in environmental disclosure. Though the disclosure is voluntary (to a certain extent) its inadequacy creates information asymmetric and risk that affect the cost of capital structure financing.

The study was on listed Nigerian companies whose activities have an environmental repercussion. Where the data was gathered from content analysis of the companies' annual reports. A regression analysis based on the pool, 2SLS and 3SLS were made to improve the robustness of the results.

It provides evidence in support of companies' stakeholders' engagement through disclosure to manage the cost of capital structure financing. The disclosure level effect on the cost of capital structure will help curtailed negative environmental activities of the companies.

However, the sample size is small due to the limited number of publically listed companies in the Nigerian. Additionally, the data is cross-sectional which may not be stable over time and across industries level.

Recommend for further study that will look into financial stakeholders' perception about the environmental disclosure and its value relevance in financing decision.

Keywords:

Environmental Disclosure; Information Asymmetric; Disclosure Quality; Cost of Capital Structure Financing; Nigerian Listed Companies

JEL Classification: M41, Q56, E22

1.0 Introduction

Over the past two decades, environmental activities of Nigerian companies become a notch on regulators and other environmental concern stakeholders in the country. This is due to the private enterprise's porch for profit maximisation at a detriment of environmental protection and sustainability (Omofonmwan & Osa-Edoh, 2008). The companies scramble for resources consumption in the production process, and the pollutions therefrom negatively affect the environment.

Though, this situation is not peculiar to Nigeria as prior studies in environmental accounting observed less environmental commitment by companies operating in developing countries (Belal, Cooper, & Roberts, 2013; Fifka, 2012). This is because of the exploitation tendencies of the companies operating in the countries. This makes the countries vulnerable to the negative impact. For example, Hassan and Kouhy (2014) study of multinational oil companies in Nigeria observed poor compliance to environmental regulations by the companies. Similarly, it was earlier reported by Uwuigbe and Uadiale (2011) that 80% of the companies that operate in Nigeria discharge environment harmful substance into the eco-system with no proper treatment.

These undesirable environmental activities result in a concern by the companies' stakeholders that demand environmental performance (Omofonmwan & Osa-Edoh, 2008). The stakeholders require the companies to adopt operational measures that will protect the environment. Alternatively, suffer furious actions detrimental to their survival and financial performance (Huang & Kung, 2010). They also require them to be accountable and transparent to enable objective risk assessment of the companies' investments. This demand makes the companies engage in environmental disclosures that inform, educate and sometimes diverts stakeholders pressure on the companies' environmental performance (He & Loftus, 2014; He, Tang, & Wang, 2013). The stakeholders need the environmental information for a cost of capital determination (Cormier, Ledoux, & Magnan, 2011; He et al., 2013). This is because a greater number of financial stakeholders are external to the companies and rely on both the financial and the non-financial (environmental disclosure) information to make financing decisions.

However, a problem arises where the companies fail to provide detail and candid information about their environmental activities. The absence of a satisfactory disclosure brings about information asymmetric (gap) between the companies and stakeholders. This gap negatively affects the companies' cost of capital structure financing (Berthelot, Coulmont, & Serret, 2012; Cormier et al., 2011). Because the stakeholders are left with no option other than to seek the information from another source. The source charges a price for the information access and the users add it to the cost of capital structure financing. Similarly, information risk arises where the stakeholders questioned the quality of the disclosed environmental items. To safeguard themselves against the risk, a premium charge is made in the determination of the cost of capital financing.

Therefore, the study examines the environmental disclosure effect on the cost of capital structure financing of the Nigerian listed companies. Though, Delmas and Cuerel Burbano (2011) noted green-wash issue in environmental reporting due to its discretionary nature. Therefore, the study further examines both the disclosure level and disclosure quality effects on the cost to unveil the information value relevance of the disclosure in the cost of capital determination.

The study contributes to the strategic importance of environmental disclosure in Nigerian companies' cost of capital structure financing management. It used stakeholder's theory to espouse the relevance of environmental disclosure as a tool that helps bridge the information

gap between the companies and financial stakeholders. Also, it provides additional support to the notion that engagement in the environmental disclosure improves information asymmetric issue. This helps achieve a favourable cost of capital structure financing because the stakeholders have access (at no extra cost) to the information relevant to the financing decision. Unlike the relevance of voluntary theory in environmental disclosure studies of developed countries. The theory is not consequential in Nigerian context because the stakeholders did not appreciate value relevance of the disclosure quality items. This supports de Villiers and van Staden (2006) opinion that environmental accounting studies should be country-specific due to the peculiarity nature of environmental activities and developmental level of the countries.

2.0 Conceptual Development of Environmental Disclosure and Cost of Structure Capital financing

The development in modern-day business provides companies with opportunities to finance their capital structure from capital markets through the issuance of debt stocks and equities. A company capital structure is “mixture of long-term debt and equity such as debenture, long-term debt, preference shares capital and reserves and surplus for uses to finance its operations”. (Premkanth, Aziz, & Le, 2015, p. 250). The composition of these financing alternatives formed the capital structure used to measure a company’s value. Thus a company’ overall capital structure financing is measured by the composition of the debt and equities. While a cost of capital is the expected return on capital finance supplies reflected as a charge for the financing services. It is the minimum rate acceptable by the market to extend financing to a company.

In the determination of the cost of capital, the market considers among others, information about environmental activities of the companies. The availability and adequacy of the information affect the cost of capital financing (Cormier et al., 2011). This is due to the information asymmetric and risk considered by the stakeholders in financing decisions.

Stakeholder’s theory provides for engagements that help companies meet its stakeholders’ expectations. Therefore, with the rise in environmental stakeholders’ movement companies engage in environmental disclosure to serve the stakeholders with relevant information for financing decisions. Sumiani, Haslinda, and Lehman (2007) opined that this disclosure is important to both companies and other interested users as it helps satisfy accountability function of stakeholders’ information need and market advantage. It served as an indicator of a company consciousness to environmental issues brought to the stakeholders’ notice.

A company with strategic intent voluntarily disclose environmental activities to influence the cost of capital charge by the capital market. However, not all disclosures are value relevant due to the strategic implication associated with the voluntary action. It happens in an instance where a rival company manipulates the information to the detriment of the company making the disclosure of its actual environmental performance. This brings about the need for disclosure quality for the users to appreciate its value relevance.

Voluntary disclosure theory provides for the non-obligatory disclosure of quality performance information to the public with intent to achieve favourable selection (Clarkson, Fang, Li, & Richardson, 2013; Dye, 1985; Verrecchia, 1983). The expectation is that disclosure quality is associated with lower cost of capital due to the value relevance of the information to the investors (Cormier et al., 2011; He et al., 2013; Plumlee, Brown, Hayes, & Marshall, 2015). They argue that information quality help wins the investor confidence about the genuineness and transparency of the company. It helps lower information risk with the provision of items difficult to mimic by non-performing companies. Thus, a negative effect on the cost of capital structure financing favourable to the company.

The conceptual view of the study is shown in figure 1 below:

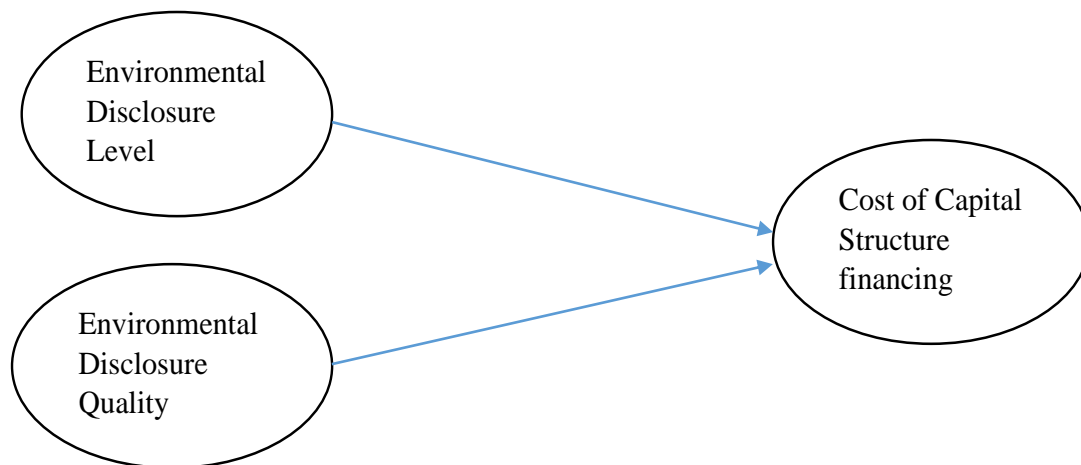


Figure 1: Conceptual Model of Environmental Disclosure Effect on Cost of Capital Structure Financing.

Figure 1 above depicts a conceptual view of the disclosure effect on the cost of capital structure financing. High-level disclosure of environmental activities affects the cost of capital financing by reducing information asymmetric between the stakeholders and the company. Likewise, the disclosure of quality environmental items improves value relevance of the information. This helps reduce information risk effect on the cost.

3.0 Literature review and Hypotheses

Because of the discretionary nature of the environmental disclosure, environmental performance contingent liabilities are not commonly disclosed, and where the disclosure is made are more of soft/unverifiable claims of the performance (Clarkson, Li, Richardson, & Vasvari, 2008; Clarkson, Overell, & Chapple, 2011). Though, the rise of sustainability investors' funds makes companies engage in environmental disclosure. This is to enable them access sustainability investors, green investors' groups' funds. However, information asymmetric problem arises where the investors are not adequately informed about the companies' environmental performance. This information risk affects the financing access due to the high cost of capital which ultimately affects the companies' capital structure financing.

Social and environmental accounting research strive to provide explanations about companies' environmental disclosures and financial performance, however, no conclusion is reached (Endrikat, Guenther, & Hoppe, 2014; Healy & Palepu, 2001b; Leuz & Wysocki, 2008). Little effort is made to appreciate environmental disclosure effect on the cost of capital financing.

Lambert, Leuz, and Verrecchia (2007) work showed the appreciation of voluntary disclosure in financing strategy and its effect on the cost of capital. They support the view that disclosure of relevant information to stakeholders reduces information asymmetric and risk perception. Thus, the disclosure serves companies' strategic financing objective of influencing capital market risk perception of companies' investment. This information value relevance for risk assessment can be extended to environmental disclosures.

Botosan and Plumlee (2002) study of disclosure level and equity capital cost, though not specific to environmental disclosure, report a negative relationship between the cost of capital financing and disclosure level, and a positive between timely (quality) disclosure and equity financing cost. This finding got the support of voluntary disclosure theory of the asymmetric/symmetric role of disclosure in risk estimation. It aligned with Lambert et al.

(2007) positive effect of disclosure quality on the cost of financing through the reduction of information symmetric that suppress market risk perception of the company's investment.

Likewise, Dhaliwal, Li, Tsang, and Yang (2011) documented a positive effect of CSR on company's valuation, companies with higher CSR tend to disclose more and enjoy a lower cost of capital. Clarkson et al. (2013) showed incremental disclosure role in companies' financial performance. A positive relationship was reported between disclosure and company value, and no significant effect of disclosure on the cost of capital is established. However, a similar work by Cormier et al. (2011) in Canadian context maintained the positive effect of social and environmental disclosure on capital financing.

A study of Plumlee et al. (2015) provided additional evidence of voluntary disclosure effects on companies' value. Using GRI index report positive effect of disclosure quality on the companies' valuation. The cost of equity is both positively and negatively related to the disclosure, depending on the disclosure type and nature. This positive relationship is further proven in the Malaysian context by San Ong, Tho, Goh, Thai, and Teh (2016) who documented a positive effect of environmental disclosure quality on companies' earnings per share. Though, they noted lower disclosures by the companies which indicate a low appreciation of the disclosure benefits.

The foregoing showed the capital market is critical to a company's environmental information that affects financing costs and access. For example, China, He et al. (2013) observed that investors show interest in environment-friendly companies in order to support sustainability. They supported the market information risk assessment effect on the companies' capital structure financing, as high-risk companies are constrained from capital market finances due to high costs imposed by the market.

It can be opined that companies' environmental disclosures lower risk premium assigned to companies' stock by investors, and ultimately reduce capital financing cost. The company wins investors' confidence in its future cash flow and enjoys favourable financing preference at a lower cost as a result of the disclosure quality.

Financial stakeholders are instrumental to company's survival through the provision of financing resources beneficial to the companies. Instrumental stakeholders' theory argued that companies' gain economic value with stakeholders' engagement through disclosure of environmental activities (Jones, 1995). Similarly, empirical literature by Dhaliwal et al. (2011); He et al. (2013) reported a significant relationship between environmental disclosure and cost of capital structure financing of companies. Therefore, stakeholders' engagement through high-level disclosure enhances the companies' reputation, bridge information asymmetric, and ultimately the favourable cost of capital structure financing.

The study provides the following hypotheses:

H1a: *There is a negative relationship between environmental disclosure level and cost of capital structure financing of the Nigerian listed companies.*

Notwithstanding the importance of high-level disclosure in bridging information asymmetric, financial stakeholders further considered value relevance of the disclosure items (Clarkson et al., 2013). Thus, high-level disclosure along may not necessarily serve the information needs of the investors. Companies with outstanding performance resort to disclose quality items to signal the capital market about their differences. The voluntary disclosure of the quality items provides a favourable market selection in financing the companies' capital structure. With the disclosure of the quality environmental items, risk assessment improves and high performed

companies are placed in capital structure financing advantage. Where the disclosure quality is not made readily available, information risk will arise. This will make the investors ask for the high cost of capital in financing the companies' activities.

Empirical work of Easley and O'hara (2004) on disclosures and companies' cost of capital have shown that disclosure quality determined financing cost chargeable on investment. This finding underscores the relevance of disclosure in risk assessment. Where relevant information is not readily available, premium rate is charged. This is in order to cover unascertained risk on the investment. Likewise, where investors are fully informed about all companies' activities, and the risk assessment is low the charge rate is lowered. However, Cormier et al. (2011); Cormier and Magnan (2007) show the disclosure of sensitive environmental activities by a company can trigger stakeholders' sanctions and increases the cost of capital financing. But this observation needs to be re-examined because it was previously shown that display of candidness in environmental activities improves the quality of the disclosure, enhances reputations, translates into lower cost of finance and favourable capital structure financing.

Following voluntary disclosure theory, it can be hypothesised that:

H1b: *There is a negative relationship between the environmental disclosure quality and cost of capital structure financing by Nigerian listed companies*

4.0 Method and Model Specification

The study population is 77 manufacturing companies listed in Nigerian Stock Exchange Market (NSE) as at December 2016. The choice of the companies is influenced by their operations that are believed to have environmental implications. Analysis of the data is made on 53 companies representing 68.83% of the population. Though the number appears small, this is common in environmental accounting studies. For example in Australian studies Sutantoputra, Lindorff, and Johnson (2012) used 53, Clarkson et al. (2011) 51; US study Gao and Connors (2011) 47, Cho, Roberts, and Patten (2010) 43; New Zealand study Hooks and van Staden (2011) 34; Malaysian study 50; and in Nigeria Hassan and Kouhy (2014) selected 11 companies. Additionally, the sample size in Nigerian context is constrained by the non-availability of the publically listed manufacturing companies.

4.1 Environmental disclosure index measure

The publicity nature of annual report provides a first choice through which companies report their environmental activities. It is a legal document where the companies are required to disclose, in a standardised form, their annual performance. It has been indicated that information provided via company's annual report provides a first reference point to many shareholders groups (de Villiers & van Staden, 2006; Deegan, 2002). Therefore, it is expected that its information content is reliable to a greater extent.

Disclosure data is gathered based on Clarkson et al. (2008) measurement approach which was developed from GRI index. Clarkson et al. (2008, p. 305) indicators "focus on company disclosures related to its commitment to protect the environment,". They provide different environmental information ranked according to the disclosure items. The items are grouped into Governance structure and management systems (6); Credibility (10); Environmental performance indicators, EPI (60); Environmental spending (3); Vision and strategy claims (6); Environmental profile (4); Environmental initiatives (6).

Many prior studies followed the Clarkson et al. (2008) measurement, adopted the GRI index. For example, see Christina and Janice (2014); Iatridis (2013); Moroney, Windsor, and Aw (2012); Sutantoputra et al. (2012).

4.1.1 Content Analysis

Environmental disclosure data is gathered with a content analysis of the companies' annual reports for 2016. The method transformed narrative texts, code them into a numeric value that allows inferences and replications (Vourvachis & Woodward, 2015). It is "a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use" (Krippendorff, 2012, p. 24). The texts are classified into scales for stress-free assessment that will facilitate the achievement of a designed aim.

The Clarkson et al. (2008) index is developed within the context of GRI reporting framework, divided into verifiable (hard/quality) and unverifiable (soft/level) disclosure items. It is further categorised into seven sub-group, where governance and management system, credibility, EPI and environmental spending are Disclosure quality items. The items assess in an objective manner a company actual committed to the environmental performance. While Disclosure level items are grouped into company strategy and vision statement, environmental profile and environmental initiatives. The items are mere management claims difficult to verify as actual performance effort.

With the popularity of content analysis in environmental accounting research, this work follows the same approach. The environmental disclosures are extracted from annual reports for the year 2016. This is used in the determination of the level and quality of the disclosure.

4.1.1.1 Environmental Disclosure Level (EDL)

The environmental disclosure level is concerned with the quantity of the items disclosed irrespective of the nature or value of the information content. No particular dichotomy is made between general and specific statements, and either quantitative or qualitative. The purpose is to assess the breadth of the disclosure (Hooks & van Staden, 2011). It is measured by statements of Vision and strategy (6 items), environmental profile (4 items), and environmental initiatives (6 items). A binary system of 1 (disclosed) and 0 (not disclosed) is used to get a total score for each category.

4.1.1.2 Environmental Disclosure Quality (EDQ)

The assessment of the environmental disclosure quality is necessitated because of the need for information value relevance of the disclosure. The aim is to make distinctions between good environmental performers and poor performers by the ranking of the index and assigning high scores to hard disclosure items. They are sub-group into governance and management system (6 scores), credibility (10 scores), EPI (60 rank-scores), and environmental spending (3). More weight is given to EPI items because of its importance specificity to environmental issues. Therefore, where an item is disclosed 1 is given and if not 0 is scored. For EPI items the scores are ranked into six scales relative to the detail and specificity. The measure provides for the specificity and credibility of the disclosure about true environmental commitment.

4.2 Cost of Capital Structure Measures

This is concerned with the long-term cost of capital financing of company activities. The cost of capital is the aggregated cost of debt and cost of equity financing. It is a required rate of return by investors to extend finance to a company. As the study sampled companies that finance their activities with debts and equity, the overall financing costs are measured by Weighted Average Cost of Capital (WACC). It is calculated following Modigliani and Miller (1958) model as expressed in the formula:

$$WACC = E/V * COE + D/V * COD * (1 - TC)$$

Where:

COE = Cost of Equity

COD = Cost of Debt

E = Market Value of the Company's Equity

D = Market Value of the Company's Debt

$V = E + D$ = Total Market Value of the Company's Financing (Equity and Debt)

E/V = Percentage of Financing that is Equity

D/V = Percentage of Financing that is Debt

TC = Corporate Tax rate

The weighted average cost of capital gives information about the investors' assessment of riskiness of a company's investment. It is the rate that is used to discount investment future cash in relation to other investment opportunities.

4.3. Cost of Capital Structure control variables and the measures

Normally companies opt for capital structure financing with least cost of capital and maximum returns. Several factors are isolated as key determinants of capital financing decisions. From the review, the work select the following variable as predetermined variables that affect capital structure financing decisions and put them in the research model.

4.3.1 Profitability Measure (ROA)

Profit from operations is a primary source of cash used to meet current and capital financing needs. A profitable company has more resources that are cash or near cash to service obligations. A link exists between ROA and capital structure financing because profitable companies are assumed to have more cash than non-profitable ones (Darush & Peter, 2015). This makes them have little or no risk of bankruptcy, develop investors' confidence in the ability to meet principal and interest obligations. Therefore, underscore the need to appreciate the importance of profitability in the cost of capital structure financing.

This work followed the approach to include profitability in the model, proxy with ROA (EBIT/Total Assets). As in Christina and Janice (2014); Degryse, de Goeij, and Kappert (2012) Serrasqueiro and Caetano (2014) proxy of profitability with ROA (EBIT/Total Assets).

4.3.2 Tangibility Measure (TAN)

Notwithstanding the relevance of agency cost, managers are enticed to act sub-optimally in the stride to increase returns (Frank & Goyal, 2009). This makes them invest in high-risk projects that will likely result in a loss. However, to guard against failed investment collateral security is required on debts with tangible fixed assets. Thus tangibility is an important determinant of a company cost of the capital structure. The more fixed assets a company has, the more access it has to debt finance (Frank & Goyal, 2009; Sogorb-Mira, 2005). The tangibility also reduces information asymmetric because the asset can be inspected and valued.

The study adopts the measure of the Tangibility as a predetermined variable of the cost of capital structure financing, measured as Fixed Asset/Total Assets. This is similar to Hewa Wellalage, Locke, and Matlay (2015); Köksal and Orman (2015); Degryse et al. (2012) measure of tangibility of Fixed asset/Total Assets.

4.3.3 Size Measure (SIZE)

The importance of size is recognised in cost of capital structure determination, normally bigger companies accumulated valuable resources both tangible and intangible. They also enjoy economic of scale, and publicity through ratings, thus less problem of information asymmetric. Therefore, it is commonly used as a determinant of cost capital structure, and measured by the natural log of total assets as in Degryse et al. (2012) model.

4.3.4 Growth opportunity Measure (GROWTH)

A company with the opportunity to expand its activities tempted to plough back profit to finance the investment opportunity. It is justifiable on the ground that most of the companies experiencing growth are new and small (Degryse et al., 2012; Odit & Gobardhun, 2011). To

get new finance may be restricted due to information asymmetric (gap) effect on the cost of capital financing. The variable is included in the model to control for the effect on the cost. It was measured as a % change in total assets. Similar to Degryse et al. (2012) Hewa Wellalage et al. (2015) Bassey, Arene, and Okpukpara (2014) models.

4.3.5 Risk Tendency Measure (RISK)

This relates to the nature of the company's management perceived by investors and the degree of credit obligations default. It suggests high-risk companies have restricted capital financing access because of the high cost of capital demanded by investors (Sharfman & Fernando, 2008). This provides for the positive effect of the risk on the cost charged by investors in financing a company's activities. Similarly, pecking order theory provides that a company is seen as a high risk if it has volatile earnings (Degryse et al., 2012). This volatility is interpreted as uncertainty in honouring debt obligations with a likelihood of being bankrupt. Therefore, considered as a determinant of the cost of capital structure proxy by a ratio of sales to the total asset as in Hewa Wellalage et al. (2015).

4.3.6 Non-debt tax shields Measure (NDTS)

A company enjoys non-debt tax benefits from non-taxable charges such as depreciation, tax credit, among others. A company with more non-debt tax shield have less debt capital structure financing (Huang & Song, 2006). This is because debt financing is associated with a cost outside a company's operational activity. Managers go for internal financing to avoid bankruptcy risk. This gives a favourable effect on the cost of capital structure financing. The NDTS is measured as a ratio of depreciation to total assets similar to Serrasqueiro and Caetano (2014) model.

4.4 Research Models

To analyse the data, the study developed regression models using the identified variables as endogenous and exogenous. Each model incorporates all the other variables as exogenous so that they can be analysed simultaneously. This system of the estimation was first introduced by Zellner and Theil (1962). It is a special case of GMM multi-equation estimations with common variables in the equations (Hayashi, 2000). The advantage of the approach is that the exogenous variables under the 3SLS simultaneous equation are reduced to seemingly unrelated regressions.

This approach has been previously followed by researchers to avoid the problem of endogeneity among the variables (Al-Tuwaijri, Christensen, & Hughes II, 2004; Clarkson et al., 2011; Gao & Connors, 2011; He et al., 2013). In particular, Al-Tuwaijri et al. (2004) provided the support that any study that considered environmental aspects, disclosures and financial performance must adopt the simultaneous approach, rather one of the variable subsets will be incomplete.

Based on the specified approach, statistical software (STATA 13) is used for regression analysis of the data. The system is command-driven that accommodates flexibility in estimation and transformation. It is also soft on the need for distributional assumptions about the model's data and allows the use of metrics suitable for cross-sectional data (Baum, Schaffer, & Stillman, 2011). It has ado-commands embedded, including the 2SLS and 3SLS commands that allow timely and efficient analysis.

Similarly, the models are developed from a review of previous works such as Cormier et al. (2011); Dhaliwal et al. (2011); Lambert et al. (2007); Plumlee et al. (2015).

H_{1a}: A negative relationship between the environmental disclosure level and cost of capital structure financing.

$$WACC = \beta_0 + \beta_1 EDL + \beta_3 ROA + \beta_4 TAN + \beta_5 SIZE + \beta_6 GROWTH + \beta_6 RISK + \beta_7 NDTs + \varepsilon \text{ (Model H1a)}$$

H_{1b}: A negative relationship between the environmental disclosure quality and cost capital structure financing structure.

$$WACC = \beta_0 + \beta_1 EDQ + \beta_3 ROA + \beta_4 TAN + \beta_5 SIZE + \beta_6 GROWTH + \beta_6 RISK + \beta_7 NDTs + \varepsilon \text{ (Model H1b)}$$

5.0 Results and Discussion

As earlier observed information risk among others influenced the rate charged by the capital market to provide finance to the companies. There is a likelihood that environmental disclosure reduces the information risk effect on the cost of capital. The provision of the relevant environmental information narrows the asymmetric between the companies and the capital market. Thus, it reduces information risk element of the cost of capital structure financing.

5.1 Descriptive Statistics

A descriptive statistics analysis is made on the sample data to understand its nature. Where the summary of the results is presented in Table 1. The WACC has a Mean score of 3.031 a standard deviation of 0.238, indicating lower variability around Mean. The lower variability exposes non-volatility nature of the Nigerian stocks market.

Disclosure variables comprised environmental disclosure level (EDL) and environmental disclosure quality (EDQ). The variables have less disperse Mean scores, with much less variability around the Mean and Standard deviation of 0.809 and 0.278, respectively. However, EDQ is a little different, which indicates the appreciation of the need for segregation between quality and level in the disclosure research.

Table 1. Descriptive statistics of the Research Variables

| VARIABLES | (2) MEAN | (3) SD | (4) MIN | (5) MAX |
|-----------|-------------|-----------|------------|------------|
| WACC | 3.031 | 0.238 | 2.197 | 3.434 |
| EDQ | 1.544 | 0.809 | 1.526 | 3.892 |
| EDL | 3.289 | 0.278 | 2.890 | 3.689 |
| ROA | 2.374 | 0.971 | 0.693 | 4.934 |
| TAN | 3.906 | 0.504 | 2.639 | 4.585 |
| GROWTH | 2.063 | 0.912 | 1 | 4.625 |
| RISK | 4.251 | 1.070 | 1 | 6.186 |
| NDTS | 3.428 | 0.741 | 1.609 | 4.585 |
| SIZE | 16.02 | 1.322 | 13.06 | 18.14 |

5.2 Correlation Analysis of Environment Disclosures and Capital structure financing

Spearman correlation analysis was made, and the result is presented in Table 2. It shows correlation matrix among all the variable of interest in equation model H1a and model H1b.

Table 2 Correlations Results on Environmental Disclosure and Cost of Capital Structure Financing.

| | WACC | EDL | EDQ | ROA | TAN | SIZE | GROWTH | RISK | NDTS |
|------|--------|-------|-----|-----|-----|------|--------|------|------|
| WACC | 1.000 | | | | | | | | |
| EDL | -0.606 | 1.000 | | | | | | | |

| | | | | | | | | | |
|---------------|--------|-------|-------|--------|-------|--------|--------|-------|-------|
| EDQ | -0.622 | 0.412 | 1.000 | | | | | | |
| ROA | 0.196 | 0.101 | 0.025 | 1.000 | | | | | |
| TAN | 0.201 | 0.386 | 0.324 | 0.021 | 1.000 | | | | |
| SIZE | 0.303 | 0.440 | 0.078 | 0.215 | 0.311 | 1.000 | | | |
| GROWTH | 0.895 | 0.903 | 0.588 | 0.128 | 0.134 | 0.345 | 1.000 | | |
| RISK | -0.135 | 0.087 | 0.160 | 0.249 | 0.126 | -0.206 | -0.117 | 1.000 | |
| NDTS | -0.118 | 0.029 | 0.034 | -0.098 | 0.176 | 0.025 | -0.054 | 0.084 | 1.000 |

¹ Correlation ranges as in Zikmund (2003)

It can be observed that the relationship between EDL and WACC is negatively related with 0.606 coefficients. This points to opposite behaviour which can be associated with information gap between the companies and the capital market. The market information asymmetric affects the costs of capital, increasing the cost when disclosure level is low, and vice versa. In effect, companies enjoy a favourable cost of capital with high disclosure level, as shown by the negative relationship with the cost.

Similarly, the correlation between EDQ and WACC is negative with 0.622 coefficient. The environmental disclosure quality is inversely related to the capital cost. Thus, the environment-conscious companies distinguish themselves with the disclosure quality to avoid mimic by the poor ones.

5.3 Regression of Environmental Disclosures Level and Cost of Capital Structure Financing

A regression analysis is made with WACC as endogenous variable and EDL as exogenous variables together with the control variables. The results are shown in Table 3 below, revealing R-square of 0.681 in column (1) and 0.642 in column (2) and (3). These indicate sufficient strength of the data to explain the results.

Model (H1a) column (1) also indicates the significant negative effect of EDL on WACC with 0.0764 coefficient at 5% p-value and standard error of 0.0204. Column (2) also reveals a significant negative effect of EDL on the WACC with a coefficient of 0.0907 and standard error of 0.0363 at 5% p-value. The result improved with a standard error of 0.0331 at 1% p-value in the column (3). Based on the result of the 3SLS, a 1% change in EDL brings about a negative change in WACC with 0.0909 coefficient.

The control variables are reported from the results of column (3). ROA, TAN and SIZE show significant positive effects on the cost of financing with 0.0278, 0.0235, 0.0436 coefficient at 1% p-value and 5% p-value for SIZE, respectively. While GROWTH, RISK, NDTs have significant and negative coefficient of 0.0124, at 1% p-value, 0.0176, 0.0420 at 5% p-value for RISK and NDTs, respectively.

Table 3 Results on environmental disclosure and cost of capital structure financing

| VARIABLES | <i>Model ((H1a) EDL ↔ WACC</i> | | | VARIABLES | <i>Model ((H1b) EDQ ↔ WACC</i> | | |
|-----------|--------------------------------|---------------------|---------------------|-----------|--------------------------------|---------------------|---------------------|
| | (1) Pool WACC | (2) 2SLS WACC | (3) 3SLS WACC | | (4) Pool WACC | (5) 2SLS WACC | (6) 3SLS WACC |
| EDL | -0.0764** | -0.0907** | -0.0907*** | EDQ | -0.0587 | -0.0416 | -0.0416 |

¹Zikmund (2003) provides for numerical ranges of the correlation strength between -0.10 to +1.00. Further broken into three: Small correlation -0.10 to -0.29 and +0.10 to +0.29; Medium correlation -0.30 to -0.49 and +0.30 to +0.49; Large correlation -0.50 to -1.00 and +0.5 to +1.00.

| | | | | | | | |
|--------------|-----------|------------|------------|--------------|-----------|-----------|-----------|
| | (0.02040) | (0.0363) | (0.0331) | | (0.045) | (0.0432) | (0.0394) |
| ROA | 0.0277** | 0.0278** | 0.0278*** | ROA | 0.0177 | 0.0223* | 0.0223** |
| | (0.0106) | (0.0106) | (0.0097) | | 0.0119 | 0.0114 | (0.0104) |
| TAN | 0.0230*** | 0.0235*** | 0.0235*** | TAN | 0.0111** | 0.0171*** | 0.0171*** |
| | (0.00548) | (0.00561) | (0.00511) | | (0.00480) | (0.00516) | (0.00470) |
| SIZE | -0.420** | 0.0436** | 0.0436** | SIZE | -0.133 | -0.219 | -0.219 |
| | (0.186) | (0.191) | (0.174) | | (0.219) | (0.210) | (0.192) |
| GROWTH | 0.124*** | -0.0124*** | -0.0124*** | GROWTH | 0.165*** | 0.142*** | 0.142*** |
| | (0.0151) | (0.0153) | (0.0139) | | (0.0122) | (0.0150) | (0.0137) |
| RISK | -0.0167* | -0.0176* | -0.0176** | RISK | -0.0145 | -0.0127 | -0.0127 |
| | (0.00865) | (0.00894) | (0.00815) | | (0.00972) | (0.00925) | (0.00843) |
| NDTS | -0.0426** | -0.0420** | -0.0420** | NDTS | -0.0277 | -0.0378* | -0.0378** |
| | (0.0180) | (0.0182) | (0.0166) | | (0.0199) | (0.0193) | (0.0176) |
| Constant | 3.781*** | 3.753*** | 3.753*** | Constant | 3.379*** | 3.667*** | 3.667*** |
| | (0.508) | (0.515) | (0.470) | | (0.572) | (0.555) | (0.505) |
| Observations | 53 | 53 | 53 | Observations | 53 | 53 | 53 |
| R-squared | 0.681 | 0.642 | 0.642 | R-squared | 0.837 | 0.857 | 0.857 |

The significant levels of coefficients are indicated with *** for 1% p-value, ** for 5% p-value, and * for 10% p-value; the items in parenthesis stand for standard error.

From the information shown in Table 3 above, there is statistical evidence to support the negative effect of EDL on WACC. That is high disclosure level is associated with lower cost of capital. That is, the disclosure level is negatively related to the cost of capital structure financing of the Nigeria companies. Thus, H1a is supported.

It can be affirmed environmental disclosure level helps bridge the information gap between the Nigerian companies and the capital market and reduces information asymmetric. Therefore, the Nigerian companies' disclosure level is intended to serve information needs of the capital market. This is to avoid unfavourable risk assessment that affects the cost of capital structure financing of the companies. As more disclosure level is made, environmental information asymmetric is reduced and the cost of capital structure falls. This is due to the disclosure role in bridging the information gap between the companies and the capital market. A high-level disclosure lower cost of capital structure financing of the companies irrespective of the quality of the items disclosed.

The finding is supported by the stakeholder's theory view of the companies make disclosure to satisfy financial stakeholders, information needs. Information asymmetric problem is reduced with the high-level disclosure of environmental activities. Hasseldine, Salama, and Toms (2005); Healy and Palepu (2001a); Sinclair-Desgagné and Gozlan (2003) works supported the relevance of instrumental stakeholder's theory in explaining the relationship between the disclosure and cost of capital structure financing.

Similarly, empirical literature contributed to the support of the negative effect of disclosure level on the cost of capital financing of companies. Alikhani and Maranjory (2013); Botosan and Plumlee (2002); Clarkson et al. (2013); Dhaliwal et al. (2011); He et al. (2013); Healy and Palepu (2001a) individually, under different context report a negative relationship between the disclosure and capital structure financing.

Thus, the findings confirmed that Nigerian capital market appreciates the importance of the environmental information. It can concur that Nigerian capital follows the trend in world environmental concern of investors in financing companies' activities. This can be connected to the fact that Nigeria is a signatory to many UN environmental sustainability agenda aimed at controlling climate and global warming, and opening by world trade liberalisation.

Similarly, this is pertinent in Nigeria because environment non-governmental organisations

agitate for environmental sustainability. Further risk threat is created by Local communities who frown, sometimes show violent tendencies to companies that are environmentally poor. Therefore, the financing of the companies' activities is affected by risk perception in the determination of the financing cost.

Another consideration for the significant relationship which cannot be ruled out is the presence and connectivity of multinationals companies operating in Nigeria. The multinationals have established environmental standards of the mother companies which required their partners to observed, including stakeholders' engagement and environmental disclosures.

5.4 Regression on environmental disclosure quality and capital structure financing

The consideration here is to show the effect of environmental disclosure quality on the cost of capital structure financing. The quality items are verifiable environmental efforts of the companies towards sustainability. It is expected that the Nigerian capital market appreciates environmental disclosure quality due to its information value relevance in the risk assessment.

A regression analysis is made with WACC as endogenous, EDQ and control variables are exogenous. The purpose is to get the effect of the EDQ on the WACC, and the results are shown in Table 3 above. It can be observed that model (H1b) shows R-square of 0.837 in column (4), 0.875 in column (5) and 0.857 in column (6). This indicates (in all the columns) a model strength of more than 80% to predict the relationships.

Column (4) result shows a negative non-significant effect of EDQ on WACC with 0.0587 coefficient and standard error of 0.0450. Though, the direction of the relationship between EDQ and WACC is negative it is not significant to explain the effect. Similarly, the 2SLS analysis in column (5) shows a negative 0.0416 coefficient and standard error of 0.0432. The 3SLS coefficient (0.0416) in Column (6) is the same with that of the model (5), and the standard error improved to 0.0394. All the model's' results indicate a non-significant effect of the disclosure quality on capital financing costs.

No significant effect of ROA on WACC is detected in the column (4) with a positive coefficient of 0.0177 and standard of error of 0.0119. Column (5) shows a significant positive effect of ROA on the WACC with 0.0223 coefficients at 10% significant level. This improved to 5% significant level and a reduced standard error of 0.0104 in the column (6). In effect, as the companies' profitability (ROA) increases also the cost of capital financing increases. Similarly, column (6) showed TAN and GROWTH are significant and positive at 1% p-value with 0.0171 and 0.142 coefficients respectively. Conversely, NDTs is negative at 10% significant value with 0.0378 coefficients in the column (5). It increases to a 5% significant level in the column (6). The column (6) also improved the standard error to 0.0176 from 0.0193, indicating the model power of the 3SLS.

As shown in Table 3 above, no statistical evidence is found to support the negative effect of EDQ on WACC that is no significant relationship. The results did not provide sufficient evidence to conclude about the negative effect of the environmental disclosure quality on the cost of capital structure financing of the Nigerian companies. Therefore, H1b is not supported.

With regards to the effect of environmental disclosure quality on the cost of capital structure financing, the finding cannot be explained by the voluntary disclosure theory. The companies did not appreciate environmental disclosure quality to signal their outstanding environmental commitment. Likewise, there is limited empirical support for this non-significant finding which contrasts with the negative effect of disclosure on the cost of capital reported in prior studies. Though, a number of the previous works (not specific to environmental disclosure) considered reported that disclosure reduces risk by making capital market informed about companies'

activities. For example, Dhaliwal et al. (2011); Easley and O'hara (2004); Lambert et al. (2007) reported a negative effect of voluntary disclosure on the cost of capital. Specific to environmental disclosure, Clarkson et al. (2013); Cormier et al. (2011); Plumlee et al. (2015) findings documented a negative effect of the disclosure on the cost of financing.

Albeit, this aligned with Connors and Gao (2010) study of US companies' information risk management effect on the cost of equity. They documented a non-significant relationship as further confirmed by Clarkson et al. (2013) on the incremental value of environmental disclosure to investors.

Nonetheless, the finding of this hypothesis appears trivial. This can be connected to underdeveloped nature of Nigeria in general and the capital market capital in particular. As developed countries have integrated environmental risk assessment in business decision-making, Nigeria is struggling with a philanthropic aspect of environmental responsibilities, rather than see the environmental performance as a win-win opportunity.

6.0 Conclusion

Environmental activities of the Nigerian companies become a topic of public discourse due to its negative effect on the natural environment and the eco-system. The companies resort to environmental disclosure to avoid information asymmetric and unfavourable risk perception. The companies' financial stakeholders, among others, consider the environmental information in the determination of cost of capital charges in financing the companies' activities. Therefore, the study examined the effect of the disclosure on the cost of capital structure financing of the listed Nigerian companies with the expectation of getting negative relationships.

The disclosure level helps reduces information asymmetric between the Nigerian companies and the capital market. This is confirmed by the negative effect of the disclosure on the companies' cost of capital structure financing. However, the companies did not appreciate information value relevance of the environmental disclosure. There was no statistical evidence to support the negative effect of the disclosure quality on the companies' cost of capital structure financing.

Interestingly, the study contributes to the application of stakeholder's theory in understanding companies' environmental behaviour effect on the cost of capital financing. The companies can achieve a favourable cost of capital structure financing through high-level environmental disclosure. It shows stakeholders engagement with the disclosure bridge information gap between the companies and the capital market. This ultimately allows unprejudiced assessment of the companies' financing viability. It also discovered that extending voluntary disclosure theory to environmental disclosure quality is not empathetic. It might be that the Nigerian capital market participants did not appreciate the value relevance of the environmental disclosure in the determination of the cost of capital.

Nonetheless, caution should be taken in the use of these findings as the study is limited by cross-sectional nature of the data. This is because the data may not be stable over time and industry-level. Though all necessary effort was made to safeguard its consistency. Additionally, the cost of the capital measure is cumulative based on weighted average instead of individual analysis of the cost of equity financing and cost debt financing. It will not be known from the study which particular financing cost option most affected by the disclosure. Therefore, recommended a further study that will use industry-specific data in order to understand which particular companies that most engage stakeholders through environmental disclosure. This will help unveil the strategic application of the disclosure in influencing capital market perception about the companies' environmental performance. Also, there is a need for an industry-specific study that will look into stakeholders' perception about the environmental disclosure and its value relevance in financing decision.

Similarly, further study with longitudinal data in form of time series will improve the consistency of the findings.

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